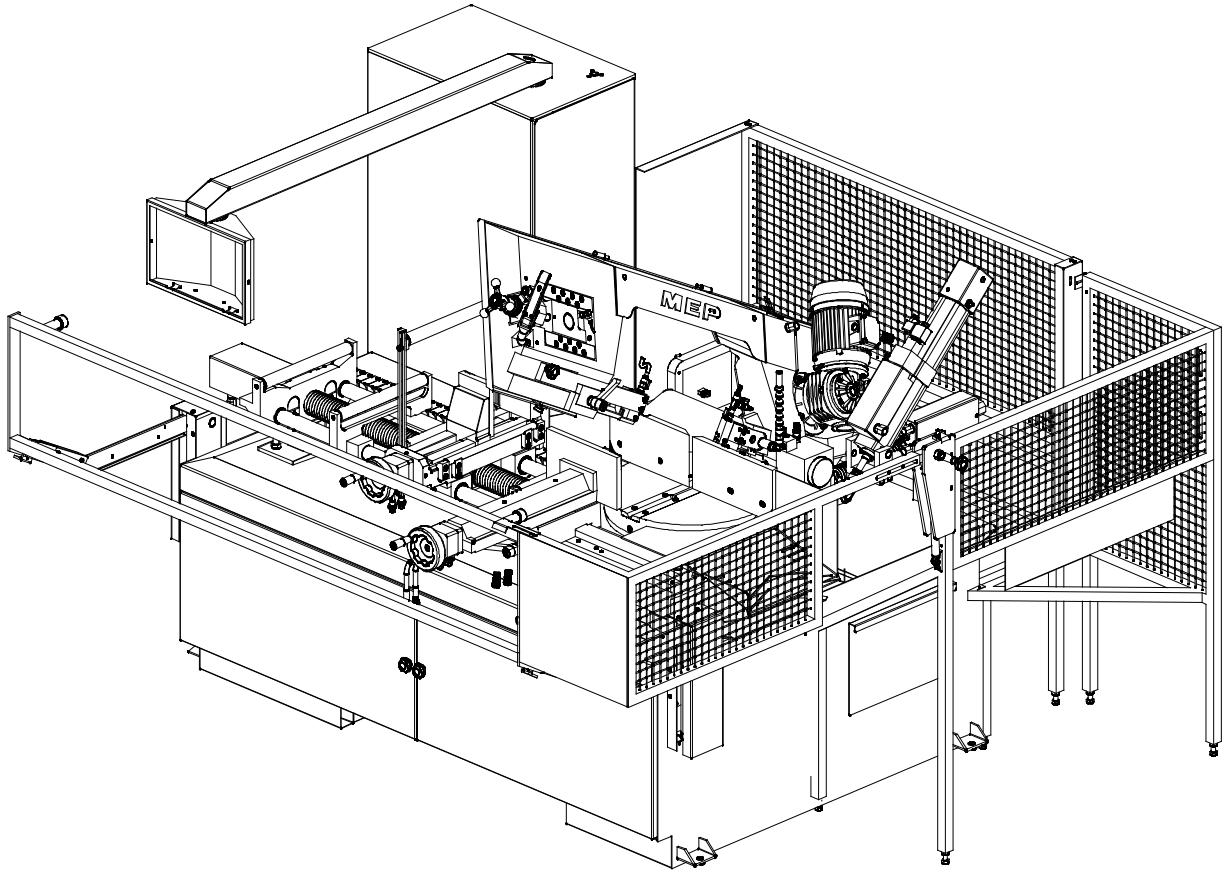


USE AND MAINTENANCE MANUAL

EN SHARK 332-1 NC 5.0

YEAR OF MANUFACTURE: _____

CE

EN

Translation of the original instructions

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

The manufacturer:

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

Hereby declares that the sawing machine:

Machine Type:	**SAWING MACHINE**
Machine model:	**SHARK 332–1 NC 5**
Serial number:	
Year of manufacture:	

is in specification wit e followin dir

- **EEC MACHI S DIREC 06/ /CE**
  - **EN 1609 17**
- **DIREC VE 201 /UE MC**
  - **EN 370–1:200**
  - **50370–2:2003 Immuni**

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

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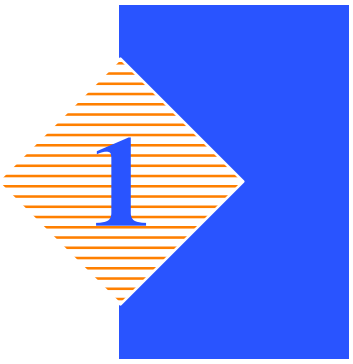
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Introduction and technical specifications



Foreword

MEP S.p.A.,in response to modern production techniques, has developed the new **SHARK 332–1 NC 5.0**.

This work tool has been designed to satisfy the wide range of cutting needs of a modern workshop with simplicity and reliability, while at the same time complying with all EEC safety standards.

The **SHARK 332–1 NC 5.0** is structurally rigid, silent and safe: it produces a minimum of waste while its great versatility makes it suitable for cutting various materials such as stainless steel light alloys, aluminium, copper and bronze at high speed and with high precision.

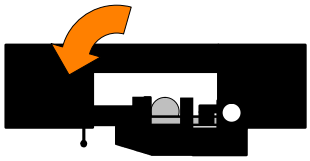
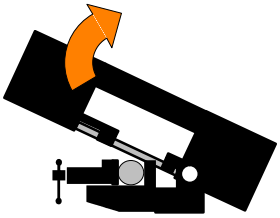
Its high cutting capacity, combined with the possibility of making inclined cuts from 60° left to 45° right, make this model the ideal solution for satisfying the wide strange of cutting needs of machine shops, turneries, structural steel shops and engineering workshops.

We congratulate our clients on having chosen this product, which will give effective and faithful service for many years, especially if the instructions contained in this use and maintenance manual are carefully followed.

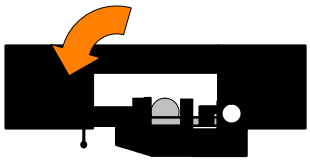
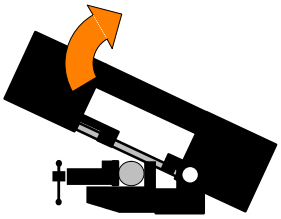
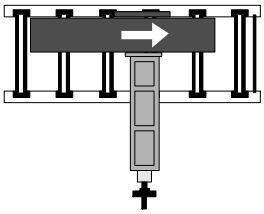
Warning This band saw has been exclusively designed to cut metals.

Machine presentation

Operation is MANUAL, SEMIAUTOMATIC, SEMIAUTOMATIC−DYNAMIC and AUTOMATIC. In **Manual** mode, after making sure the workpiece is correctly clamped in the vice, the operator grips the head control lever and presses the band saw start micro−switch. The head then moves downwards to cut the material at the preset length. In **Semi−automatic** mode, after setting the head cutting stroke on the control panel and the head downstroke speed, the operator positions the vice 2÷3 mm from the workpiece and presses the start button (or optional foot pedal if fitted) on the control panel to start up the band saw. The vice then clamps the material, the head lowers, cuts the piece and returns to its start position and the vice opens again.

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

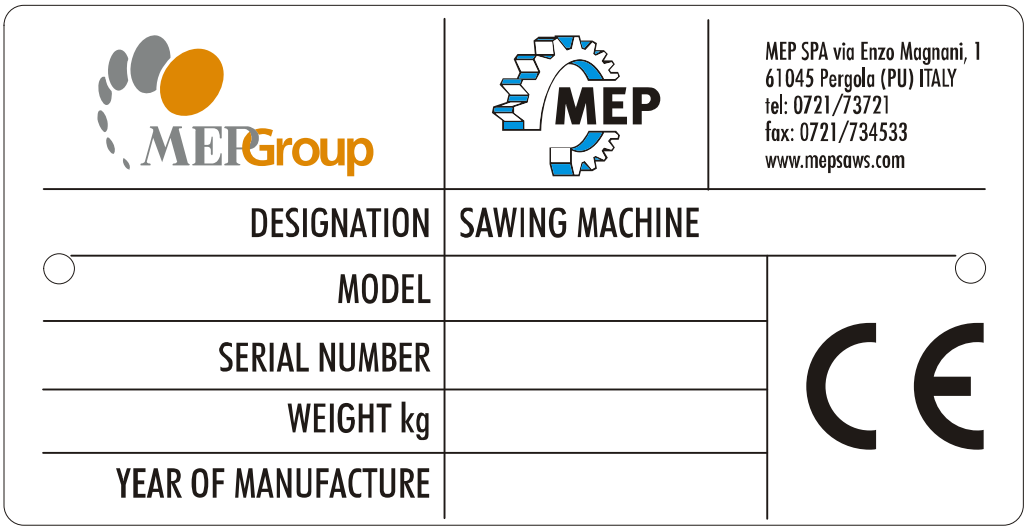
In **Semiautomatic−Dynamic** mode, the operator positions the cutting head at a distance of 5÷10 mm from the material being cut and presses the switch on the head control handgrip. At this point the machine performs the operations in the same way as for a semiautomatic cycle.
In **Automatic** mode, after setting the head cutting stroke on the control panel, the operator positions the vice 2÷3 mm from the workpiece and presses the start button (or optional foot pedal if fitted) on the control panel to start up the band saw; cont'd:

1. The cutter vice closes	2. The head lowers until the cut is made (FHLS)	3. The head returns to start position (RHLS)	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

Rating plate

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		
Blade rotation speed	m/min	15÷100

BAND SAW		
Rated size	mm	3650 x 27 x 0,9
Max/min blade length	mm	3650±30
Blade height	mm	27
Blade width	mm	0,9
Band saw tension	bar/Kg	70/ 900

Attention When choosing the cutting tool, if its dimensions do not correspond to those included in the ”Rated size” section, check that the dimensions at least fall within the admissible max/min specifications.

RATED ELECTRICAL POWER		
Spindle motor	KW	2,2
Lubricant/coolant fluid electric pump motor	KW	0,15 x 2
Hydraulic unit motors	KW	0,75
Feeder stepper motor	KW	0,315
Valve step actuator motor	KW	0,09
Blade brush and swarf remover motor (optional)	KW	0,05x2

RATED ELECTRICAL POWER		
Cooling fan motor	KW	0,04x2
Max. installed electrical power	KW	4,035

HYDRAULIC POWER PACK MOTOR SPECIFICATIONS
4−pole, three−phase, asynchronous; Frequency 50 Hz.

No.of poles	Current (Volts)	Absorption (Amps)	Power (Kw)	rpm
4	230/400	3,34/1,93	0,75/0,9	1380/1650
Protection rating IP 55.				
Conforming to CEI−EN 60034−1:2011				

WORKING PRESSURE		
Working pressure	Bar	26/30
Working pressure of vice with optional adjuster	Bar	16/25

LUBRICANT/COOLANT FLUID AND OIL		
Oil for transmission box	capacità Kg	0,32
Hydraulic oil (feeder unit)	capacità Lt	30
Lubricant/coolant fluid (oil concentration 5−6%)	capacità Lt	120

VICE		
Vice max. opening	mm	335

SPINDLE MOTOR
4−pole, three−phase, asynchronous; Frequency 50 Hz.

No.of poles	Current (Volts)	Absorption (Amps)	Power (Kw)	rpm
2	230/400	8,6/5,7	1,8	2.855
4	230/400	8/4,4	1,5	1415
Stator wound with enamelled copper wire, class H 200°C.				
Class F insulation (limit temperature TL 155°C).				
Protection rating IP 54.				
Conforming to CEI−EN 60034−1:2011				

N.B. Example of class F insulation: in air−cooled machines at an ambient temperature of 40° C (according to , the allowable overtemperature is 100° C (where 100¿C represents the allowable DT).

ELECTROPUMP MOTOR
Three−phase; Frequency 50 Hz.

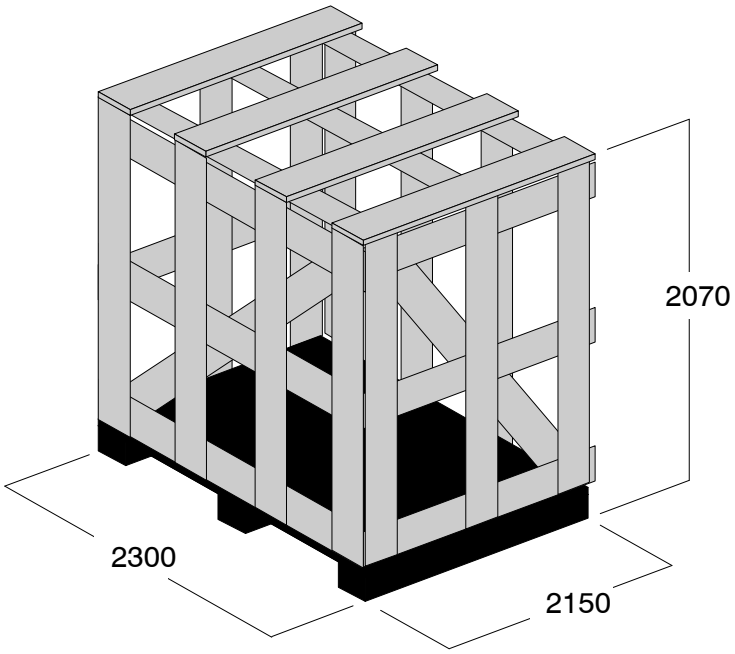
Voltage (Volts)	Absorption (Amps)	Power (Kw)	rpm	Delivery rate lt/min	Head (mt.)
230	0,74	0,15	2800	60	4
400	0,43	0,15	2800	60	4

ELECTROPUMP MOTOR Three−phase; Frequency 50 Hz.					
Voltage (Volts)	**Absorption (Amps)**	**Power (Kw)**	**rpm**	**Delivery rate lt/min**	**Head (mt.)**
Protection rating IP 54.					
Conforming to CEI−EN 60034−1:2011					

HYDRAULIC POWER PACK MOTOR SPECIFICATIONS Three−phase; Frequency 50 Hz.					
Voltage (Volts)	**Absorption (Amps)**	**Power (Kw)**	**rpm**	**Delivery rate lt/min**	**Head (mt.)**
230	0,53	0,37	2800	11	1,5
400	0,34	0,37	2800	11	1,5
Protection rating IP 55.					
Conforming to CEI−EN 60034−1:2011					

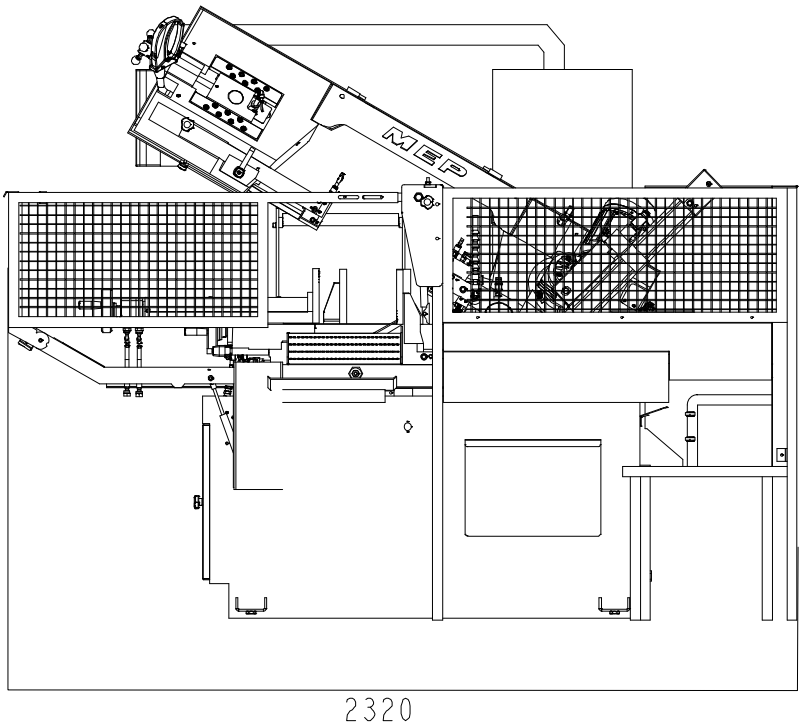
CUTTING CAPACITY			
Section	●	■	▬
0°	300	250	330 x 250
45° ◆	260	250	260 x 200
60° ◆	180	170	170 x 170
45° ◆	240	210	240 x 160

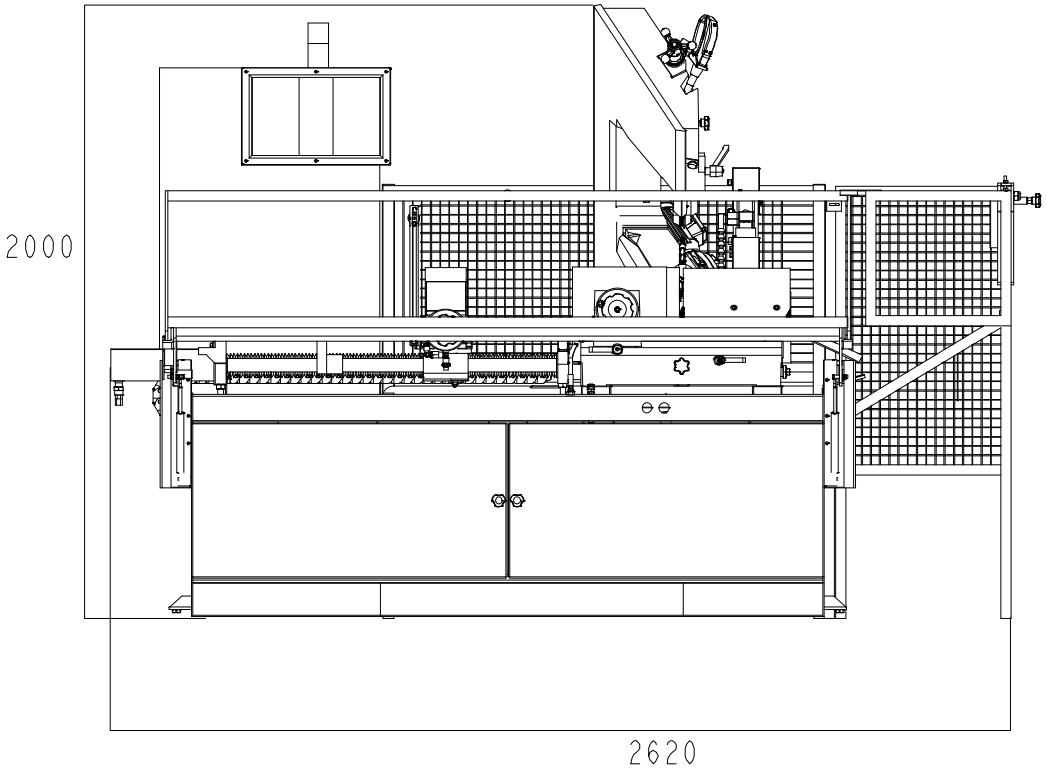
PACKED WEIGHT		
Wooden cage and pallet	Kg	150
Wooden pallet	Kg	70



Dimensions

MACHINE INSTALLED		
Work table height	mm	870
Weight	Kg	1060



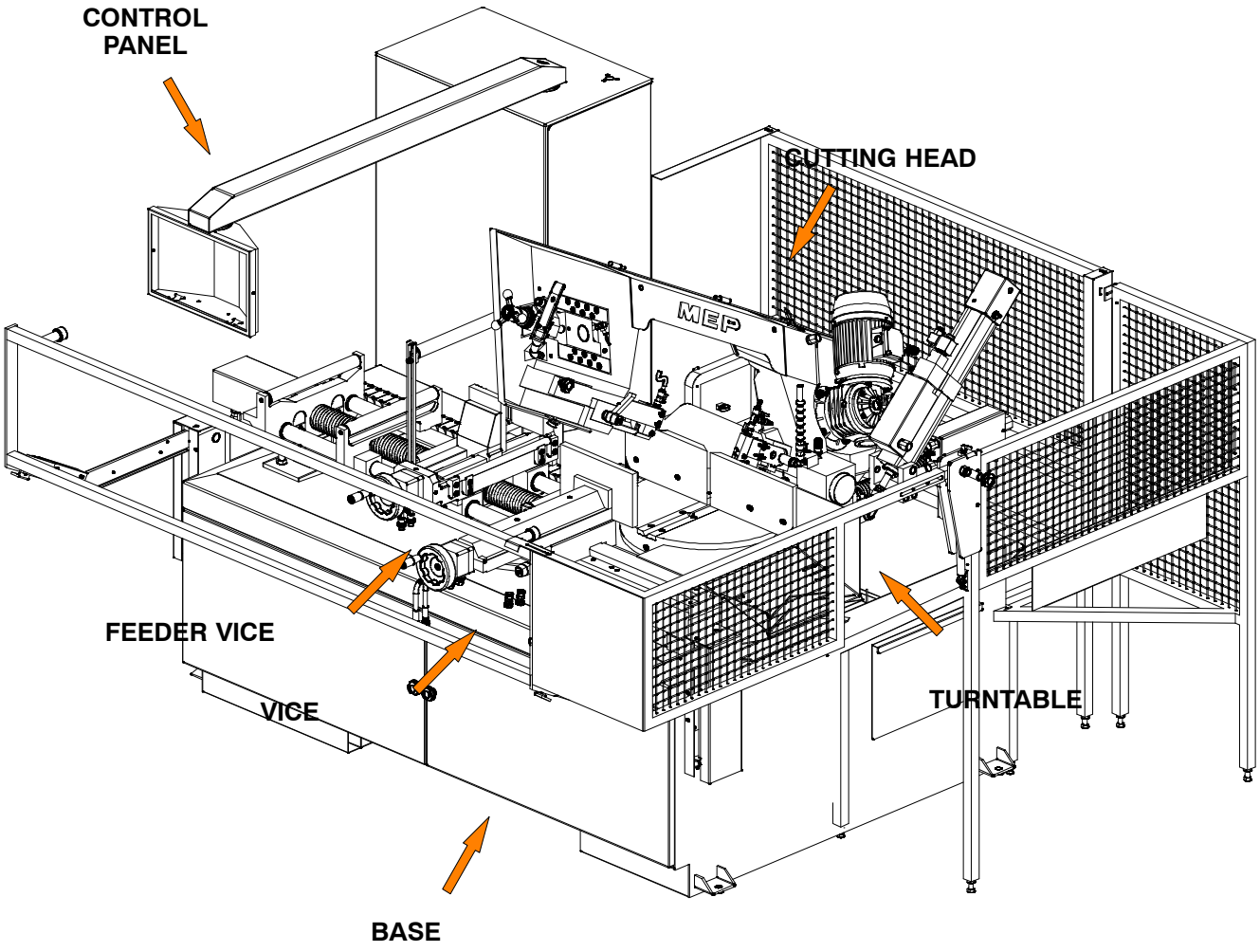


Functional parts

2

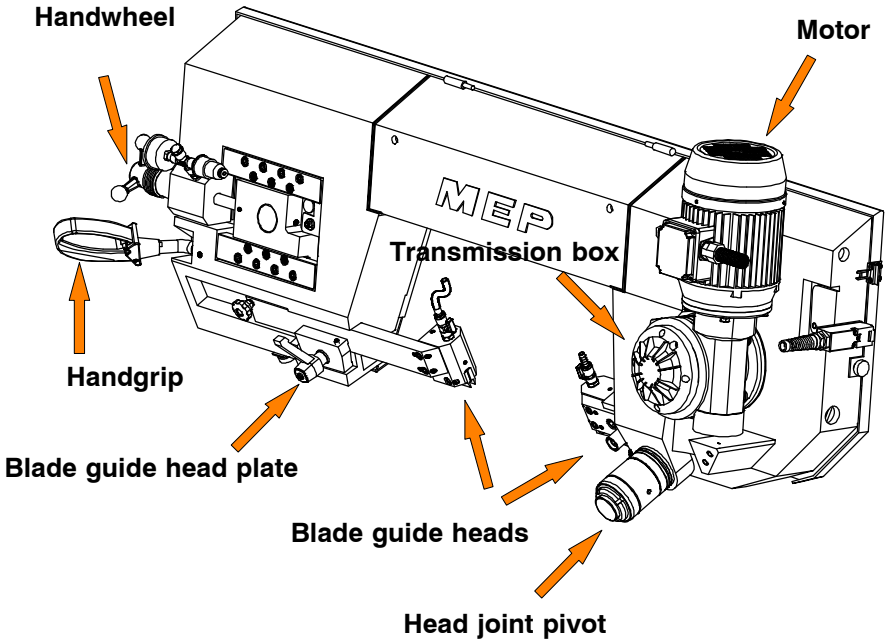
SHARK 332–1 NC 5.0 model

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.



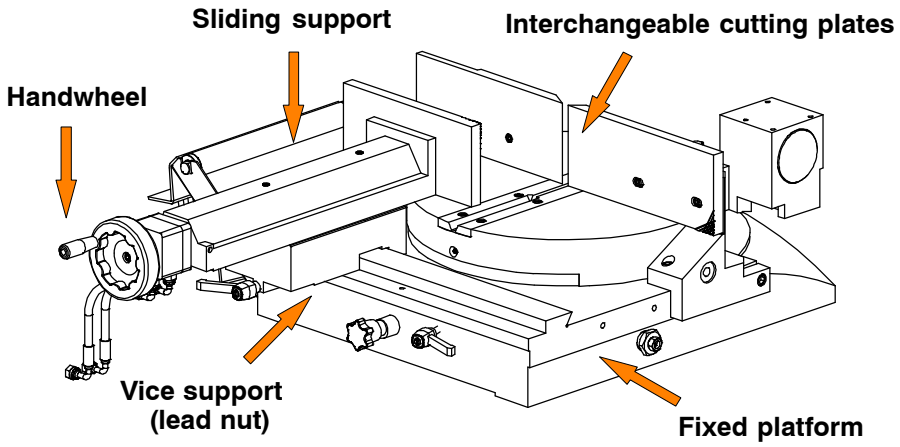
Cutting head

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. The movements of the cutter head are determined by a hinge attached to the table, and the cutting stroke is from the top down.



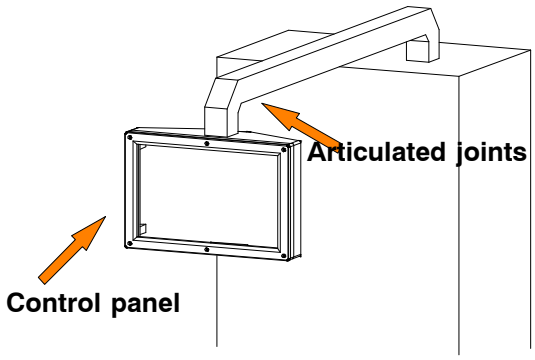
Vice

The vice is the unit that clamps the workpiece during cutting; it consists of a vice support, commonly known as a “lead nut” fixed to the work table on which a mobile jaw is mounted. The vice is operated manually by a handwheel and locked by a hydraulic cylinder.



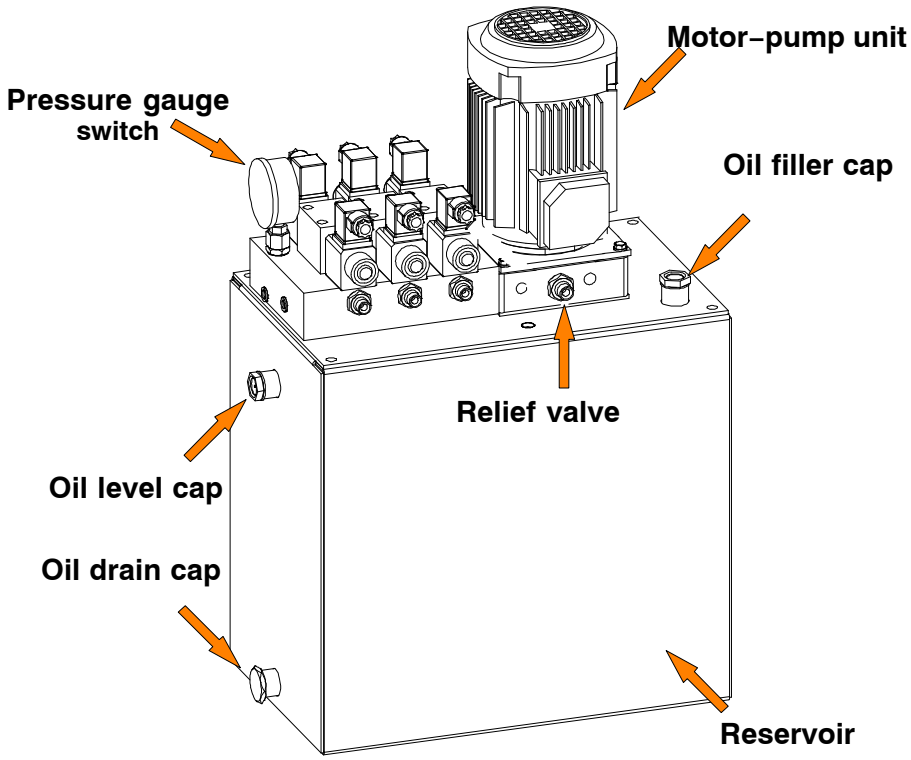
Control Panel

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.



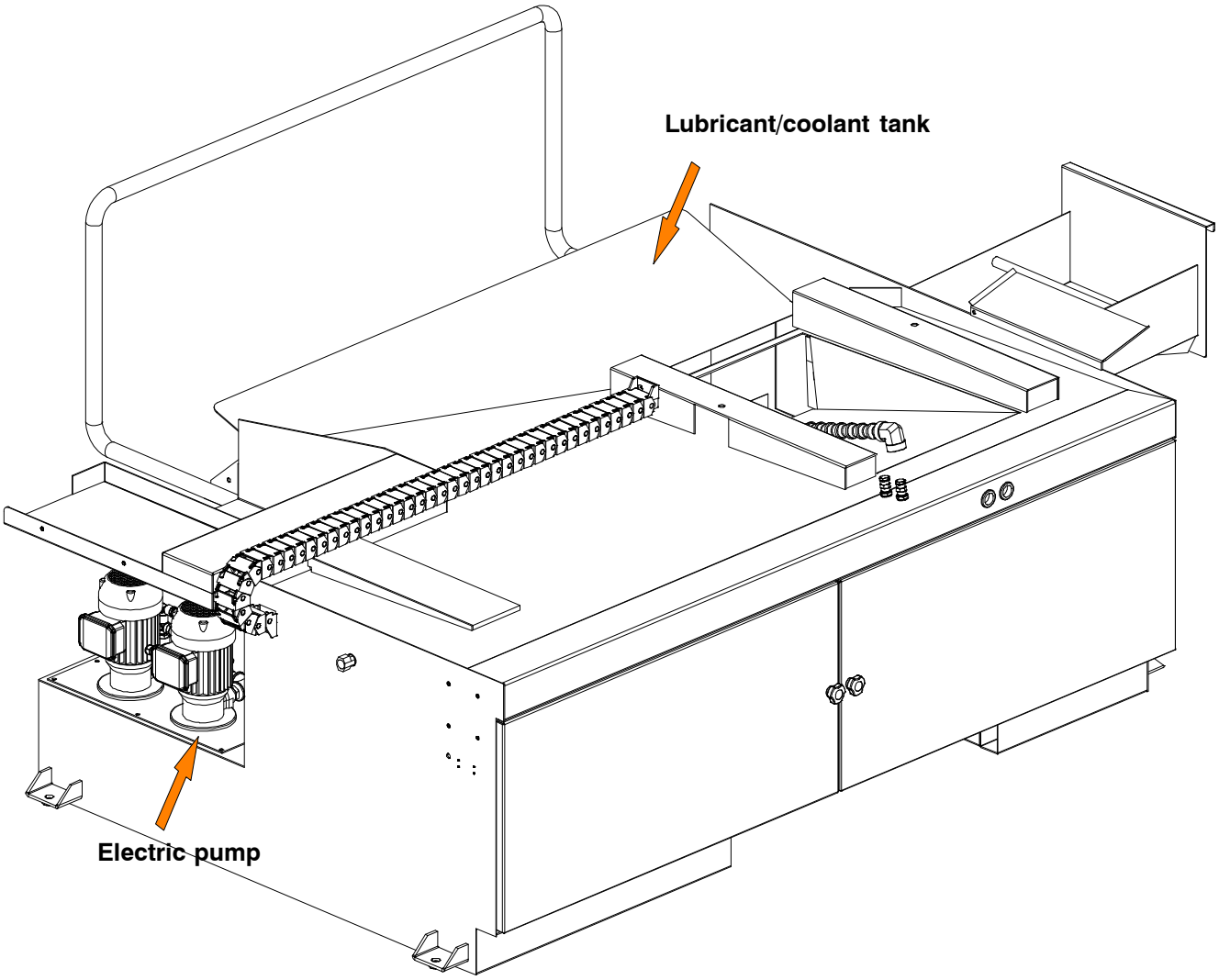
Hydraulic Power Pack Units

The hydraulic power packs activate the blade tension cylinder, the head cylinder, the cutting vice and the feed vice. They are situated on the back of the machine under the metal guard. An electro−valve piloted by the machine controller ensures exchange of oil in the circuits.



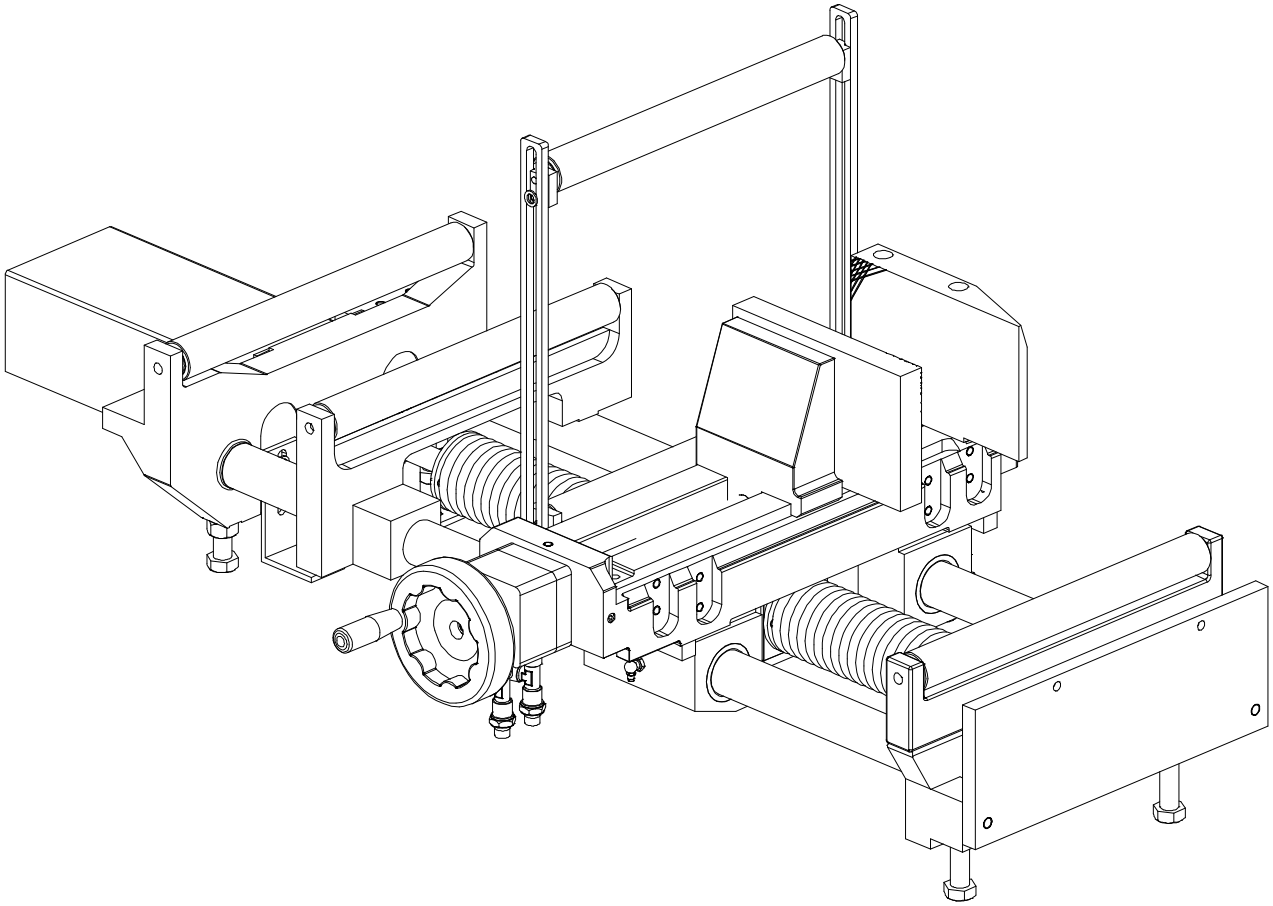
Base

This unit features a large coolant collection surface which conveys the coolant to the rear tank via the tank cover, and a swarf collection drawer. An electric pump is housed inside the tank which draws the clean fluid from the filter system.



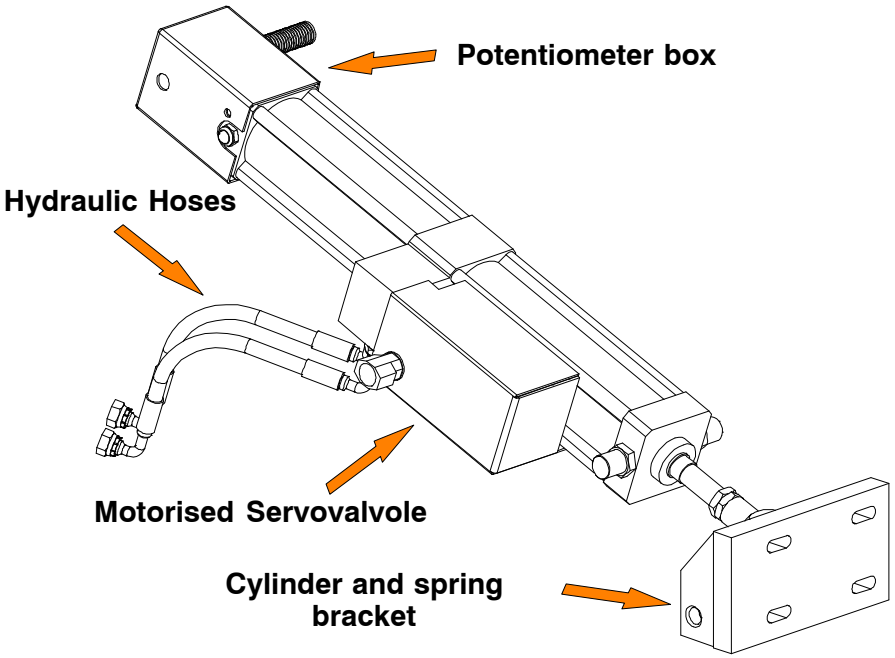
Feeder

The material is fed by the feeder trolley. Having locked the material in position using a hydraulic clamp, the trolley moves the material to be cut on guides. The numeric control manoeuvres the feeder trolley step−by−step, with great precision, thus allowing the operator to set up 1000 batches of pieces to be cut on the same bar, each with differing quantities and lengths.

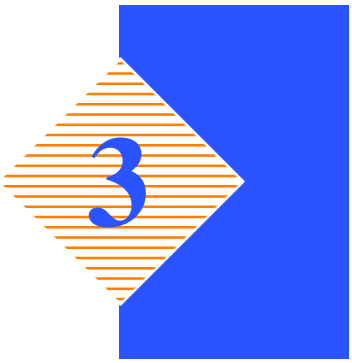


Head actuator cylinder

This is the hydraulic device that moves the cutting head between the up and down positions, in both directions.



Safety and accident prevention



The **SHARK 332–1 NC 5.0** 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 **SHARK 332–1 NC 5.0** band saw cutting machine is intended exclusively for cutting metallic materials, ferrous or non–ferrous, in section or solid.
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 **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 EN 12464−1:2011“Lighting in work environments”).

CONNECTIONS

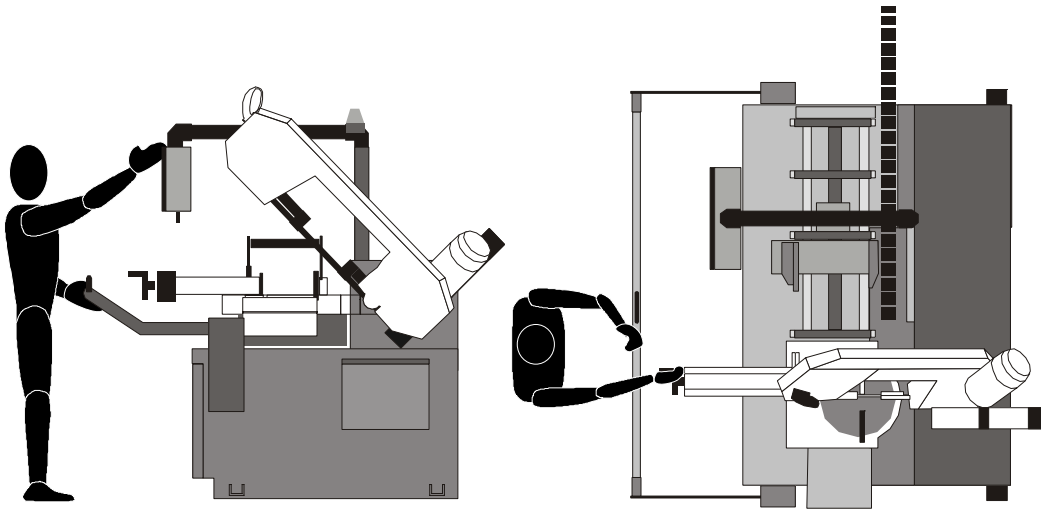
Check that the power supply cables and pneumatic feed systems comply with the maximum machine absorption values listed in the “Machine Specification” tables; replace if necessary.

EARTHING

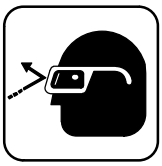
The installation of the earthing system must comply with the requirements set out in EN 60204−1:2006/AC:2010.

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.



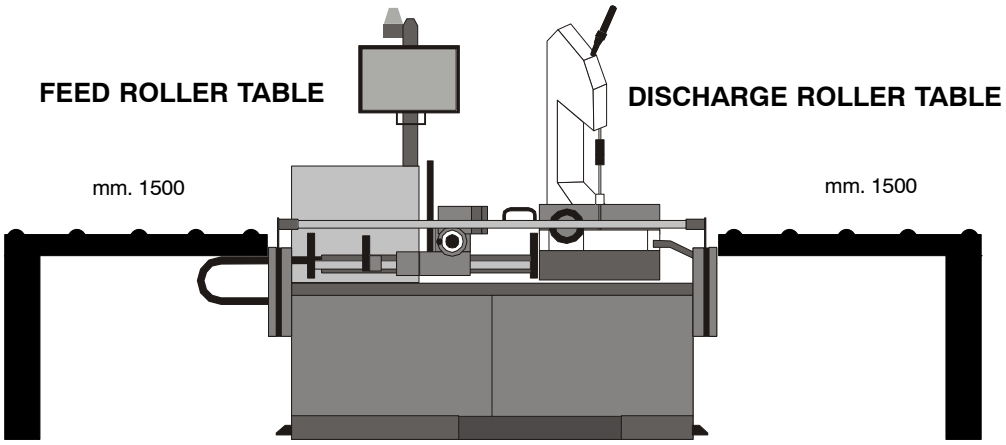
Do not wear oversize clothing with long sleeves, oversize gloves, bracelets, necklaces or any other object that may become entangled in the machine during working; long hair must be tied back and bunched.



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.



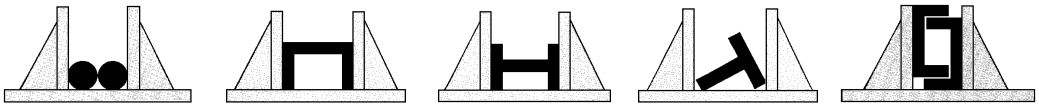
The operator must not perform any risky operations or operations not required for the machining operation under way (e.g. remove swarf or metal shavings from the machine while cutting).



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



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 different profiles correctly in our machines are shown below.



Do not use the machine to cut pieces that exceed the capacity of the machine as listed in the machine specifications.

Never move the machine while it is cutting.

Do not use blades of different sizes to those recommended in the machine 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 (MA version) check that the jaws move right up to and effectively clamp the workpiece, as the maximum travel is only 8 mm, and check that the clamping procedure is correct.

When working on the band saw, wear gloves only when handling materials and for tool changing or adjustment operations. Only perform 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 push−button immediately. If this does not free the blade, slowly loosen the vice, remove the piece and check the blade or blade teeth for breakage. Replace the blade if necessary.

Before carrying out any repair work on the machine, consult the MEP Technical Assistance Service: this can be done through a representative in the country of use of the machine.

Adjustment of the blade−guide head must only be carried out with the machine at a standstill.

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 **SHARK 332–1 NC 5.0** band saw.

Reference standards

MACHINE SAFETY

- MACHINES DIRECTIVE 2006/42/CE.
- Directive 2014/30/UE “EMC – Electromagnetic Compatibility”.
- Directive 2014/35/UE known as “Low voltage directive”.
- EN 16093:2017 Machine tools - Safety - Sawing machines for cold metal.
- EN ISO 12100:2010 “Safety of machinery - General principles for design - Risk assessment and risk reduction”.

HEALTH AND SAFETY AT WORK

- D.lgs 81/08 and subsequent amendment D.lgs 106/09;
- Directive 91/382/CE; 2003/10/CE for the protection of workers against risks caused by exposure to physical, chemical and biological agents during working;
- Directive 89/391/CE and Special EEC Directives No. 89/654/CE 2009/104/CE for improvements in health and safety at work;
- Directive 2004/37/CE for the protection of workers against risks deriving from exposure at work to carcinogenic substances;
- Directive 92/58/CE and No. 79/640/CE on safety signs at work.

PERSONAL PROTECTION

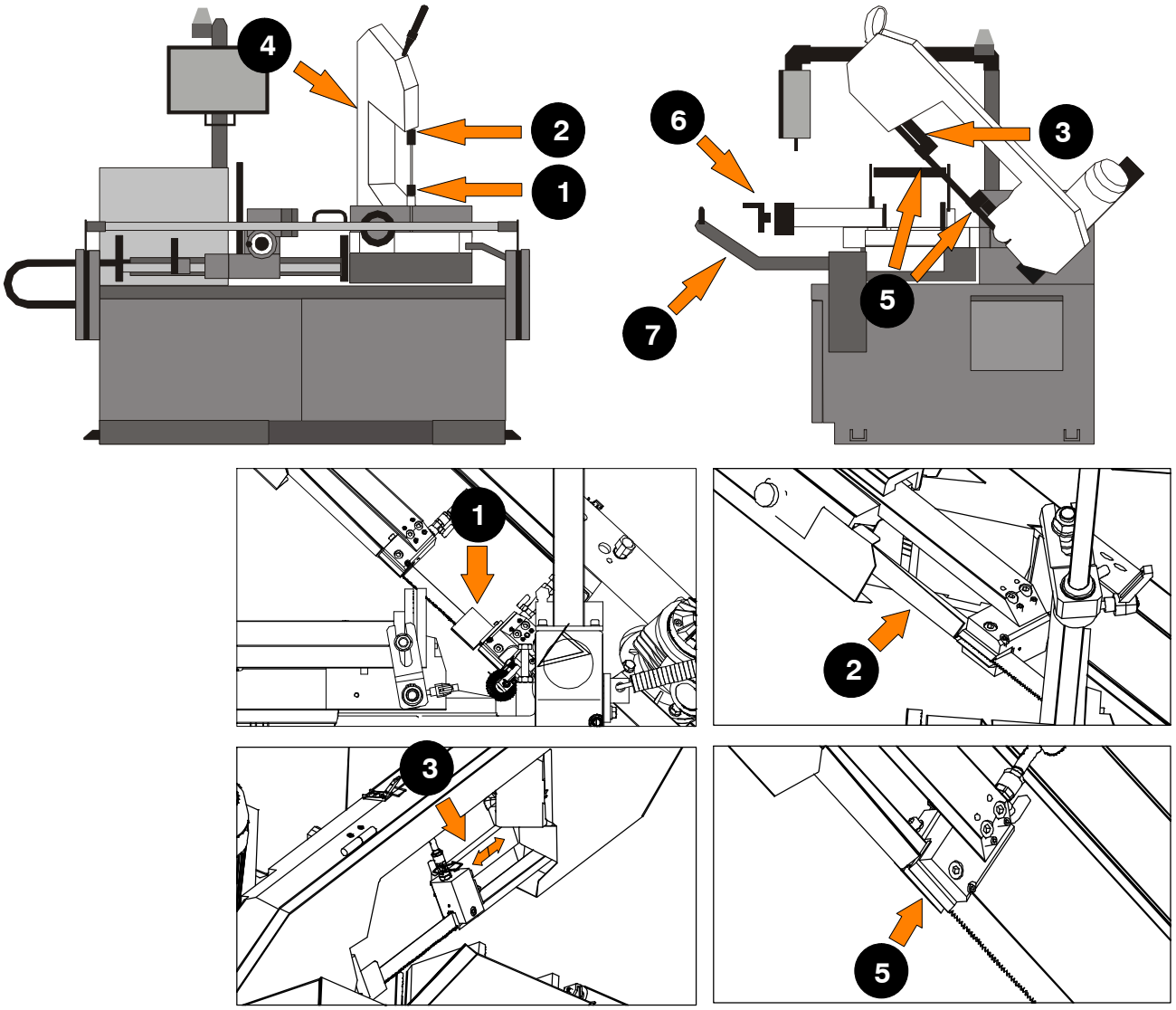
- Directive89/656/CE and Regulation 2016/425/UE on the use of personal protection devices.

ENVIRONMENTAL PROTECTION

- Directive 2006/12/CE on waste disposal;
- Directive 2008/98/CE on the disposal of used oil.
- Directive 2015/863/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS III).

Protection against accidental contact with the blade

1. Metal guard screwed to the rear blade guide head (machine side);
2. metal guard screwed to the front blade guide head (operator side);
3. front head sliding support: when the head is at maximum aperture, the support ensures that the blade is covered, leaving free only the part of the blade engaged in the actual cutting, in accordance EN 16093:2017;
4. hinged protective cover over blade, fitted with “removable” closing devices;Annex V, Part II, point 5.5.2 of D.lgs 81/08 and Subsequent amendment D.lgs 106/09;
5. blade guide plates completely covering the blade teeth;
6. the cutting vice is activated by pneumatic devices, with a maximum stroke of 8 mm. The jaw that locks the workpiece in position, must be brought to within 2÷3 mm of the workpiece;
7. front guard rail on the right section at the rear of the head ensures a safe distance between the operator and the machine’s moving parts.



Electrical equipment

In accordance with Italian standard EN 60204−1:2006/AC:2010.

- Access to electrical control panel limited by screws and panel−lock device, allowing panel to be opened only after the electricity supply has been turned off;
- 24 Vac Control voltage for actuators, in accordance with chapter 6 or European Standard ”Control and indication circuits”, paragraph 2 ”Control Circuits” sub−section 1 ”Preferential voltage values for control circuits”;
- plant short−circuit protection by means of rapid fuses, earthing of all plant parts connected with work as well as all foreseeable accidental contact; a thermal−magnetic overload cutout switch shuts down the motor;
- protection from accidental start−up by a minimum voltage relay in case of power failure.

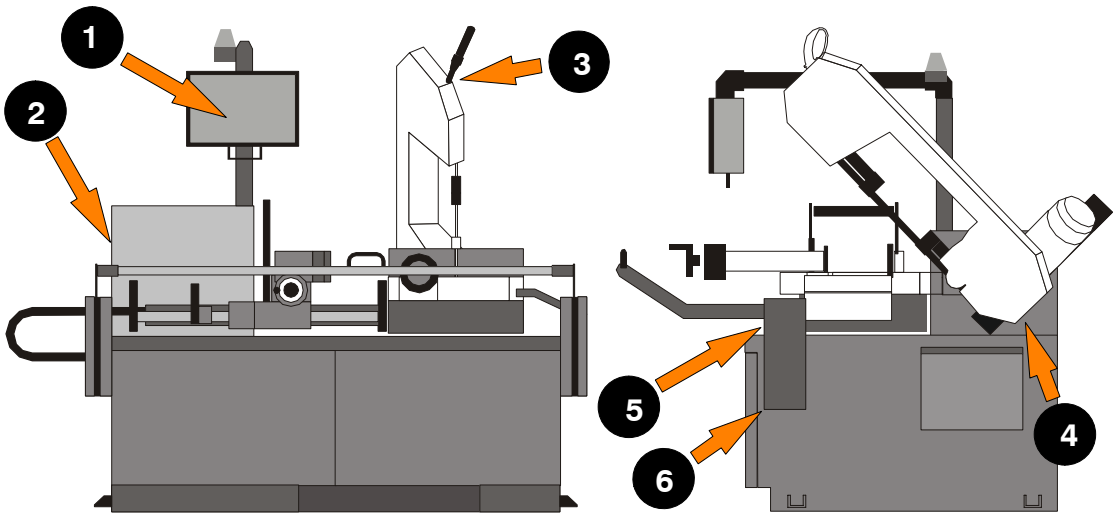
Emergency devices

In accordance with Italian standard EN 60204−1:2006/AC:2010.

- **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»;
- **chapter 6 Section 2 Sub−section 4 Point 7 "Protective guards":** «the removal of protective guards designed to prevent access to dangerous parts or zones causes the machine to stop immediately; replacing the guards does not restart the functions, which must be reset».

...Emergency devices applicable to the SHARK 332−1 NC 5.0:

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. **Automatic thermal−magnetic cutout switch with thermal−magnetic relay:** the machine auto switch, has two protection systems against voltage drops. In the case of a voltage drop, all electrical components are disengaged, the machine stops immediately, and automatic restart when the power supply returns is inhibited. Another function is that of resetting the thermal relay provided to protect against overcurrents.
3. **Load cell:** this device indicates excessive band tension or sudden blade failure on the console display.
4. **Protective guard for blade:** a coded key microswitch is operated if the blade cover is accidentally or intentionally opened during the machine operating cycle, immediately shutting down all functions.
5. **Safety switch guard rail:** in order to access the operative zone of the machine, the operator should lower the guard rail using the microswitch which stops all machine functions.
6. **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 **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 16093:2017, 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	**SHARK 332−1 NC 5.0**
Reference standard	EN ISO 3746:2010

Results		
Test 1st	**Description**	C 40 steel cut − pipe 50x82 mm Bimetal band 3650x27x0,9 S.GLB Z 5/7
	Results	**Mean sound level (Leq) 75,24 dB (A)** Environmental correction (K) 3,42 dB(A) Peak sound power (Lw) 86,34 dB(A)
Test 2nd	**Descriprion**	C 40 steel cut − solid rod 150 mm dia. Ø Bimetal band 3650x27x0,9 M42 Z 3/4
	Results	**Mean sound level (Leq) 74,19 dB(A)** Environmental correction (K) 3,42 dB(A) Peak sound power (Lw) 83,89 dB(A)
Test 3rd	**Description**	34CND6 material cut −pipe 140x130 mm Bimetal band 3650x27x0,9 S.GLB Z 10/14
	Results	**Mean sound level (Leq) 74,21 dB(A)** Environmental correction (K) 3,42 dB(A) Peak sound power (Lw) 84,69 dB(A)

Vibration emission

This sawing machine complies with the norms EN 1299:1997 + A1:2008 and EN ISO 20643:2008/A1:2012, as the machine vibration emission on the devices controlled by the operator does not exceed the threshold of 2.5 m/s^2.

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 **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 **SHARK 332–1 NC 5.0**.

Emissions

- EN 61000–6–4:2007 + A1:2011 Electromagnetic Compatibility (EMC) – Generic standard regarding emissions. Part 6–4: Industrial Environment.
- EN 55011:2009 + A1:2010 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 0.5 – 5 5 – 30	79 – 73 (linear reduction with log of frequency) 73 73	66 – 60 (linear reduction with log of frequency) 60 60	Complies

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 – 230 230 – 1000	40 47	Complies

Immunity

- IEC 61000−6−2:2005 + AC:2005 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.
- IEC 61000−4−3:2006 + AMD1:2007 + AMD2:2010 Electromagnetic Compatibility (EMC) – Part 4: Test and measurement techniques – Section 3: Radiated, radio−frequency, electromagnetic field immunity test.
- IEC 61000−4−4:2012 Electromagnetic Compatibility (EMC) – Part 4: Test and measurement techniques – Section 4: Fast transients/bursts immunity tests – Basic publication.
- IEC 61000−4−5:2014 + AMD:2017 Electromagnetic Compatibility (EMC) – Part 4: Test and measurement techniques – Section 5: Surge immunity test.
- IEC 61000−4−6:2013 Electromagnetic Compatibility (EMC) – Part 4: Test and measurement techniques – Section 6: Immunity to conducted interference, induced by radio frequency fields.
- IEC 61000−4−11:2006 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

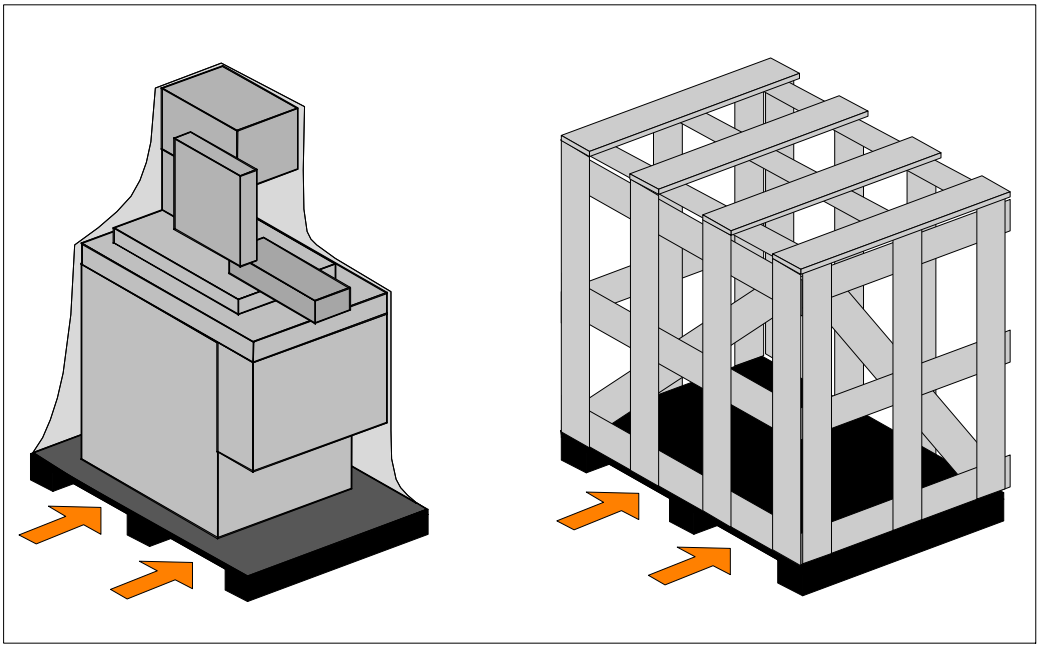
Machine installation

4

Packaging and storage

MEP S.p.A. 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:

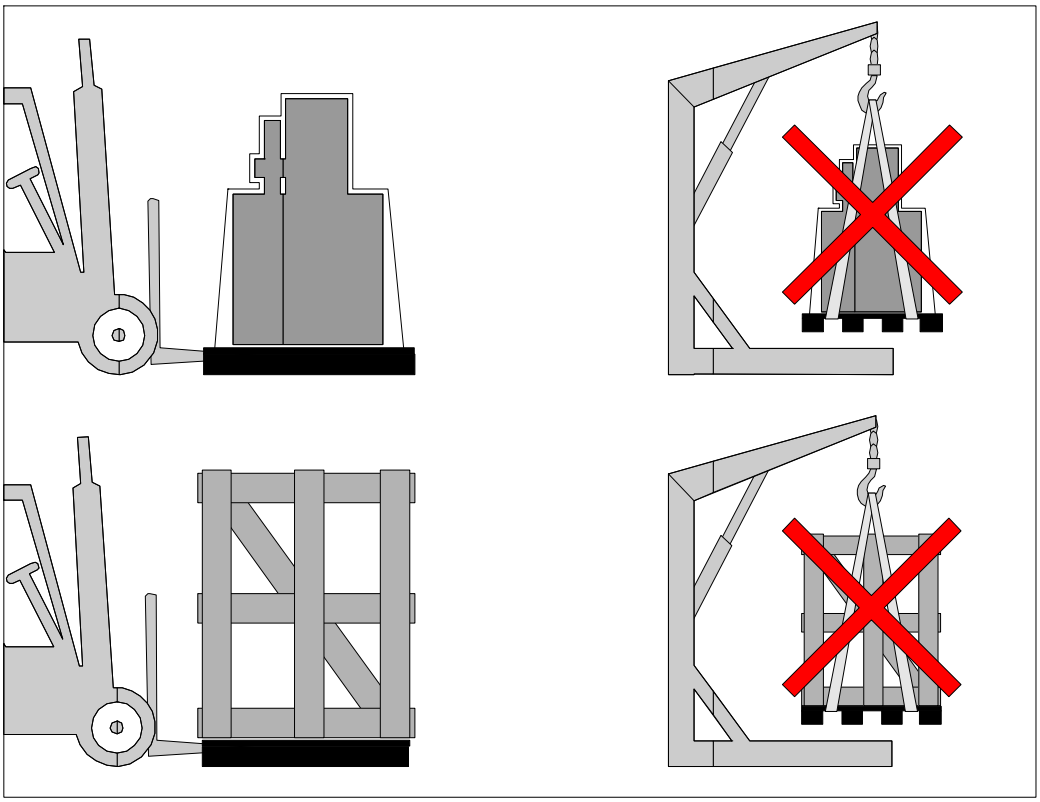


1. on a pallet with straps and heat−shrink plastic;
2. on a pallet with straps, heat−shrink plastic and a wooden crate.

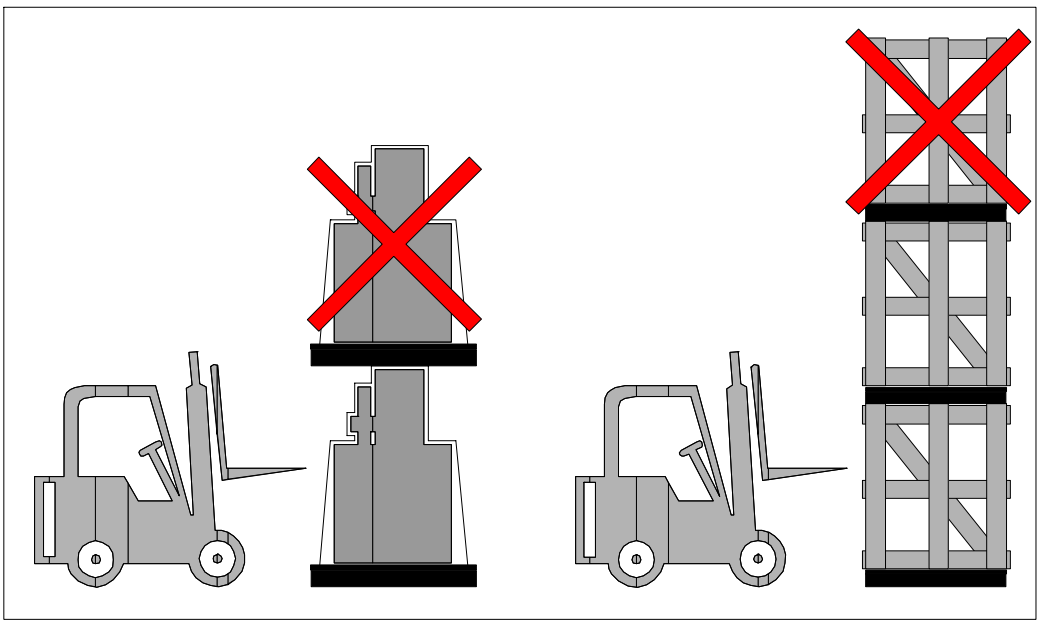
Warning In both cases, for correct balancing the machine must be handled using a fork−lift truck, inserting the tines at the points indicated by the arrows, using the reference marks on the crate itself.

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.

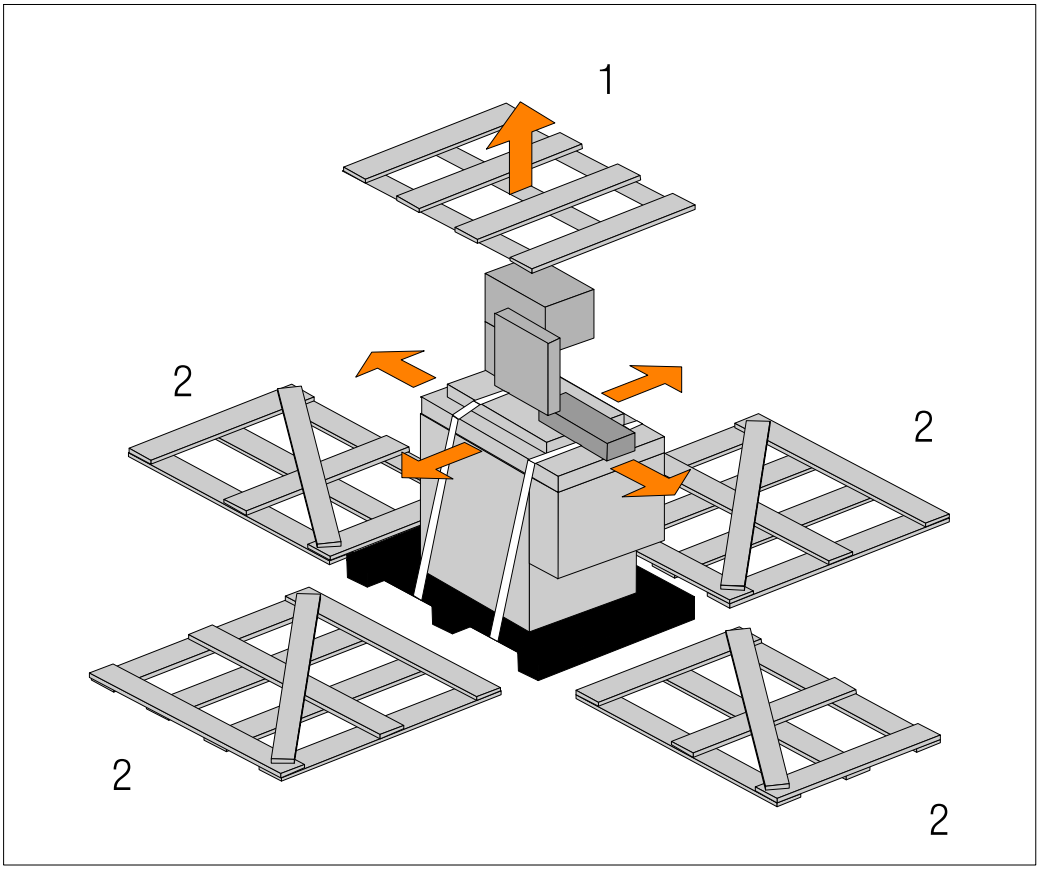


Attention When storing, machines palletized and shrink–wrapped must not be stacked two high, and machines pallettized and crated must not be stacked three high.

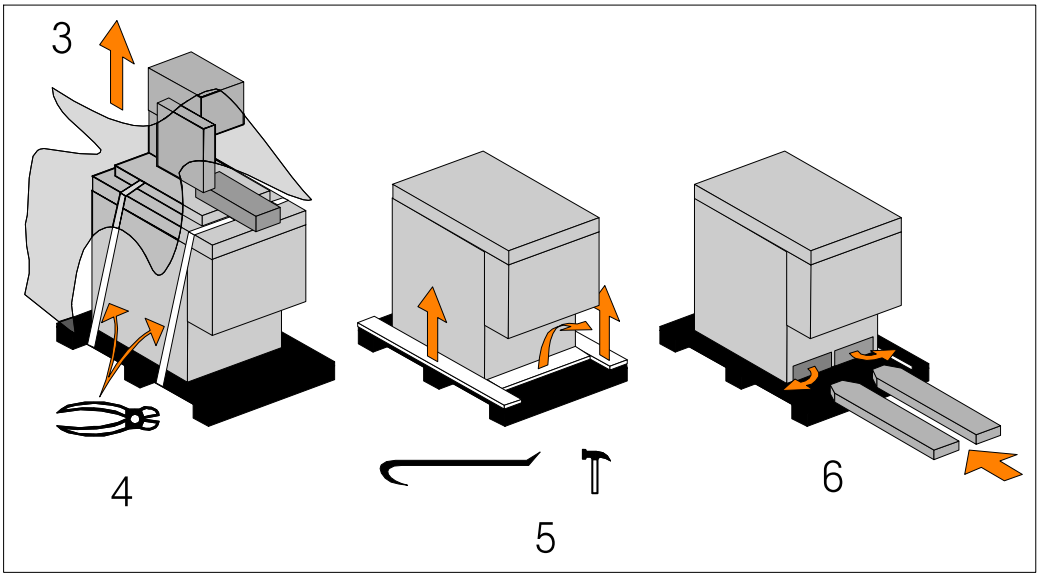


To install the machine, first remove the packing, paying particular attention not to cut any electric wires or hydraulic hoses; if necessary use pliers, a hammer and a cutter.
Open crate in the illustrated order:

1. remove nails and lift the top of the cage;
2. remove nails and lower walls;



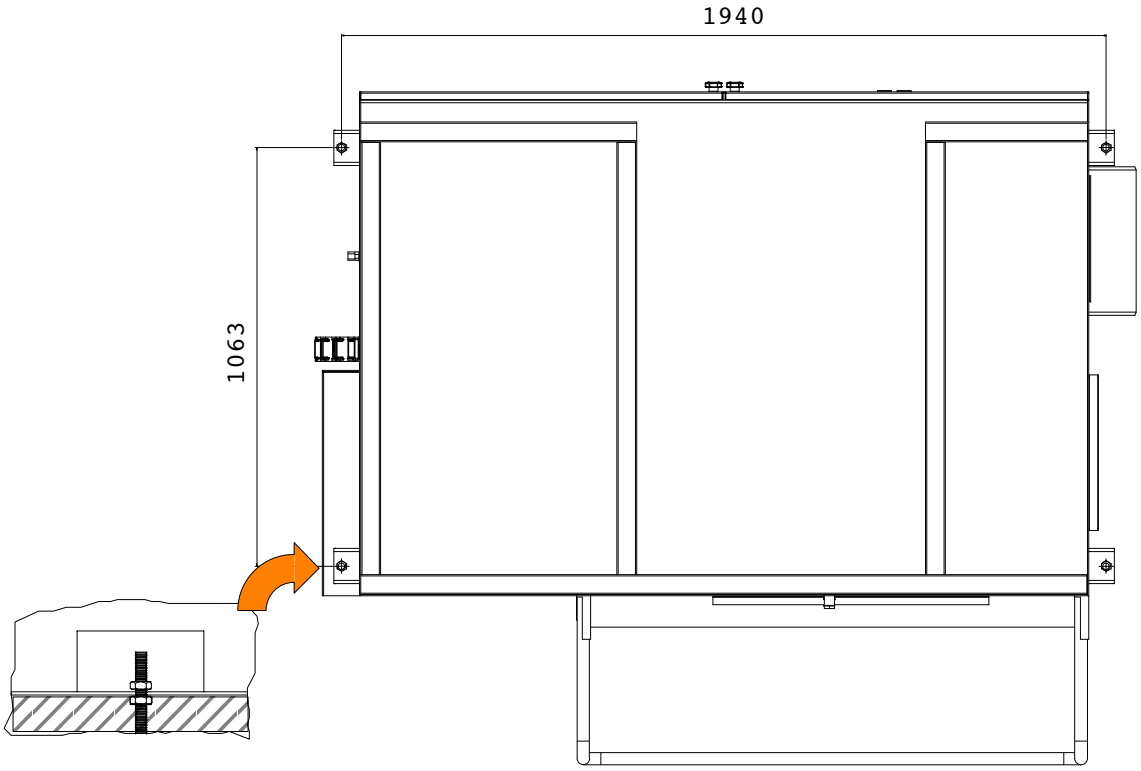
3. remove heat−shrink covering;
4. remove the straps;
5. remove nails from pallet securing planks and remove planks;
6. remove the front panel and insert fork tines.



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 basic version of the **SHARK 332–1 NC 5.0** 2–SPEED machine is supplied complete with:

CHARACTERISTICS	STANDARD	OPTIONAL
Electronic blade tensioning transducer	✓	
Infeed unit with step motor and recirculating ballscrew (length 600 mm)	✓	
Chip collection drawer, which can be replaced by motor chip discharger unit (optional)	✓	
3650x27x0.9 bimetal blade for solid and section materials	✓	
Blade cleaning brush	✓	
Designed for transpallet handling systems	✓	
Automatic control of the cutting force, with servovalve fitted directly to the cylinder	✓	
Coolant tank housed in the base with a pair of electric pumps for cooling and lubricating the blade, and the swarf drawer	✓	
7” touch screen display and mechanical buttons for the operating functions of the sawing machine	✓	
Latest generation hydraulic control unit, with high efficiency and low energy consumption	✓	
Hydraulic power unit of the latest generation with high efficiency and low energy consumption	✓	
Protective cover with safety switch of the power supply in case of opening during the cutting cycle	✓	
Positioning of the feeder shuttle and of the cutting head by means of joystick	✓	
Control and actuator systems with electrical or electromechanical protections on input and output	✓	
Cabinet for electric and electronic appliances with distinct connections	✓	
Accessory kit	✓	
Supplementary pedal control, with emergency device		✓
3650x27x0.9 M2/M42 bimetal band saw		✓
Electronic speed control (inverter) 15÷100 mt/min	✓	
K110 roller table on supply side – kit 1500 mm		✓
Roller plane adapter, unloading side, with support		✓
Roller platform adapter on infeed side		✓
K110/R1/R2/R3 roller table for discharge side, 1500÷6000 mm		✓
5 l can of emulsible oil		✓
Motor chip discharger unit		✓
Min. lubrication system		✓
Viewer cutting angle*		✓
Vice pressure control*		✓
Laser pointer and work lamp*		✓
Blade cleaning brush*		✓
Vertical vices for cutting bundles (320 x 160 mm)*		✓
Piece–unloading adjustable guide		✓
Special vise scrap reduction*		✓
Device for cutting beam		✓

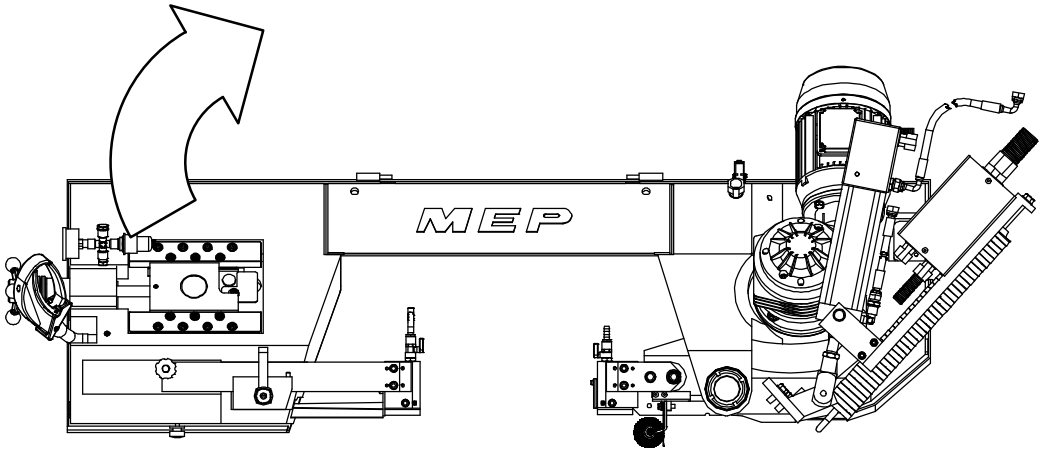
***ACCESSORIES AVAILABLE ON REQUEST**

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

- 4 and 10 mm Allen keys;
- pipe wrench 10 mm;
- measuring rod for cuts−to−measure;
- manual pump for topping up the oil in the pneumatic cylinder;
- Use and Maintenance manual, including order form for parts in relevant user language.

Balancing the cutting head

After making the electric and hydraulic connection, tension the head call spring to balance the bow weight.
Tension the spring until a balance is reached between its tensile force and the weight of the cutting head.

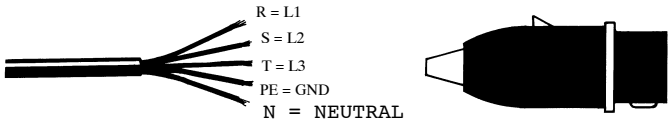


Connection to the power supply

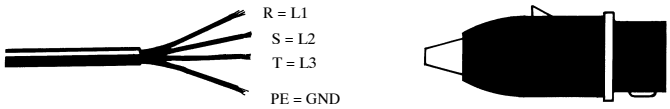
Before connecting the machine to the power supply, check that the socket is not connected in series with other machines. This requirement is fundamental for the good operation of the machine. To connect the machine to the power supply, proceed as follows:

▶ 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



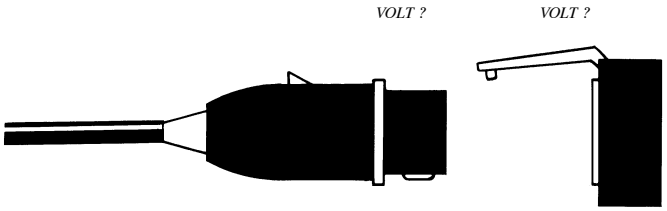
CONNECTION FOR **"4–CORE"** WIRE SYSTEMS WITH NEUTRAL



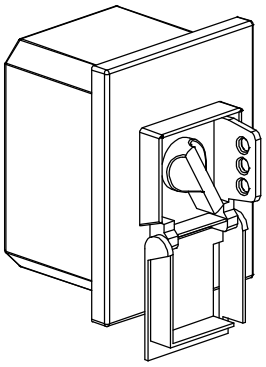
Attention

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.**

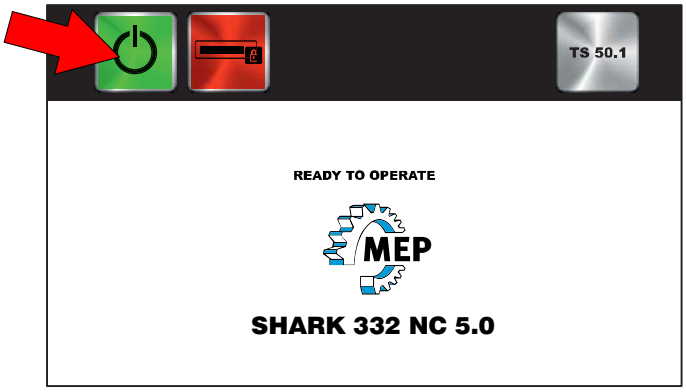
▶ Insert the plug in the socket, ensuring that the mains voltage is the same as that for which the machine has been setup.



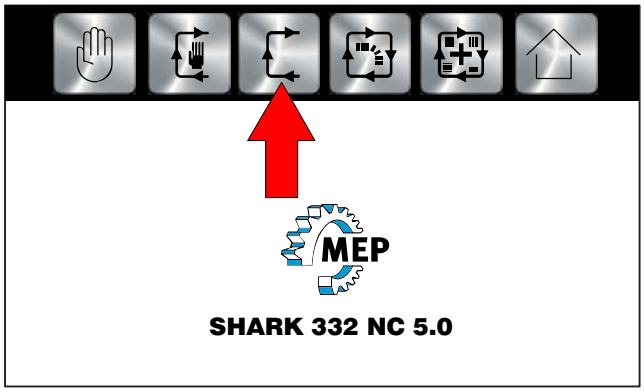
▶ Power up the machine by turning the main switch on the left hand side of the base (the control console should illuminate);



▶ press the ON button on the control console;



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



▶ press RESET.

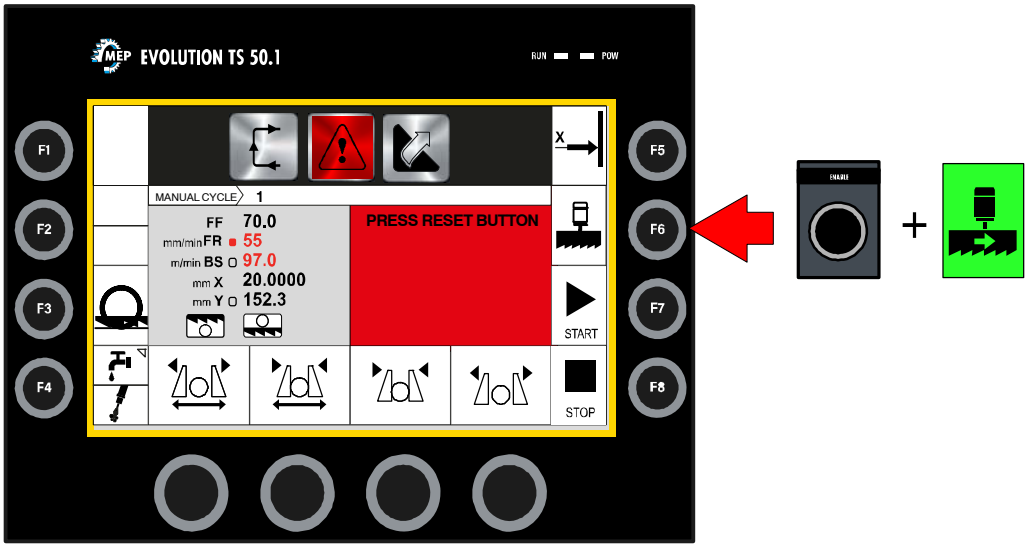
The above sequence (ON and RESET buttons) must be performed each time the machine is switched on and before tensioning the saw band during a normal production cycle.

N.B. The machine will not start if the tension of the saw band is not between 600–900 Kg.

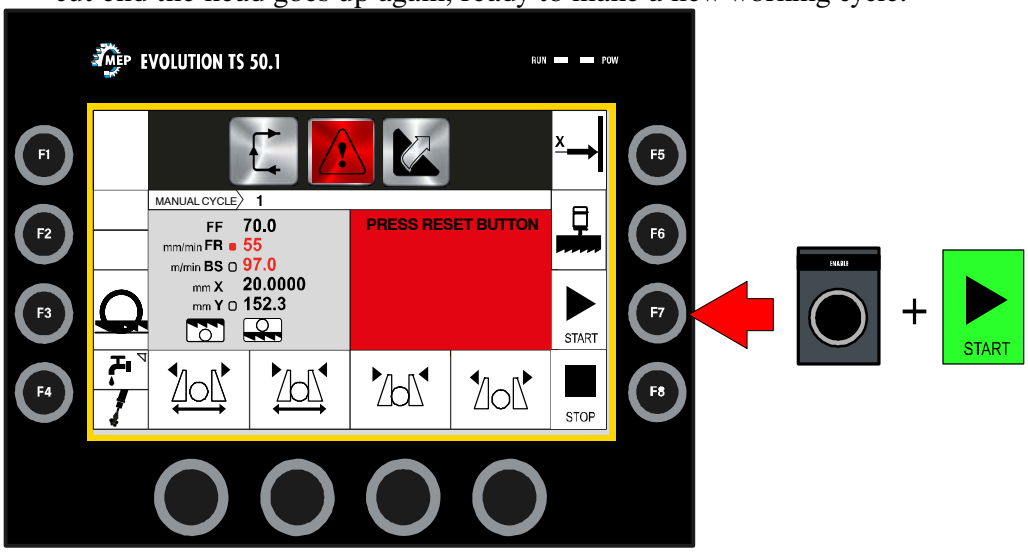
Ensure that the hydraulic power pack rotation is correct. To do this, proceed as follows:

▶ make sure the machine is not in emergency status (red mushroom head button released); otherwise, release the emergency stop button and press RESET.

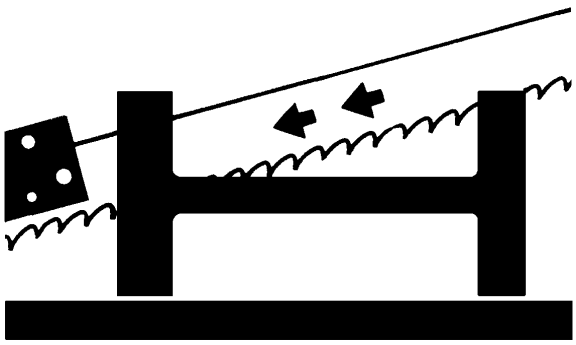
▶ Enable the band rotation by holding the control enabling key and the key shown in the figure (F6) pressed; the box lights on to indicate it has been selected.



▶ Start the cutting cycle holding the control enabling key and the key shown in the figure (F7) pressed; the band 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 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

5

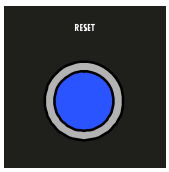
This chapter analyses all the machine functions. We begin with a description of the pushbuttons and other components on the control panel.

Description of the control panel

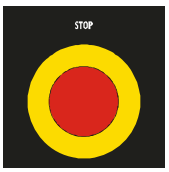
The control console is housed inside the control panel in an IP 54 rated housing which is tamperproof and resistant to dust and moisture. The control panel swivels on two articulated joints so that it can be positioned by the operator for greater ease of use and safety. The control console for the **SHARK 332–1 NC 5.0** is illustrated below.



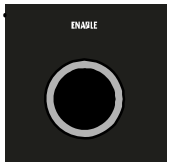
Key for control console keyboard



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.



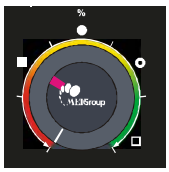
JOYSTICK:
This moves the head upwards–downwards and rightwards–leftwards while the enable commands button is pressed.



KNOB S:
This adjusts the band rotation speed.



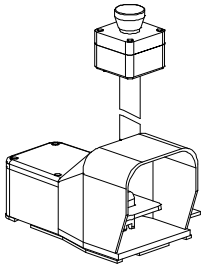
KNOB F:
This adjusts the head descent speed.



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



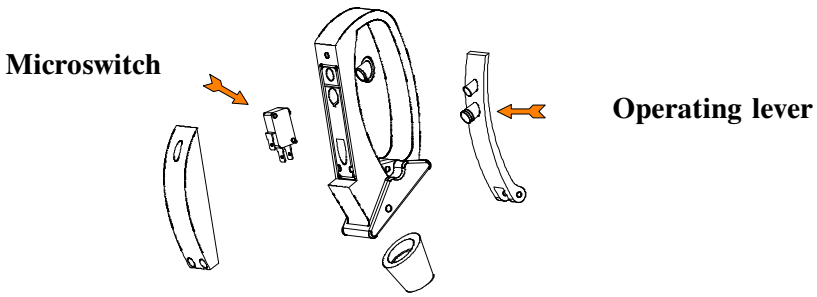
USB PORT:
Communication port for the software update and the machine diagnostics



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.

HEAD CONTROL LEVER MICROSWITCH

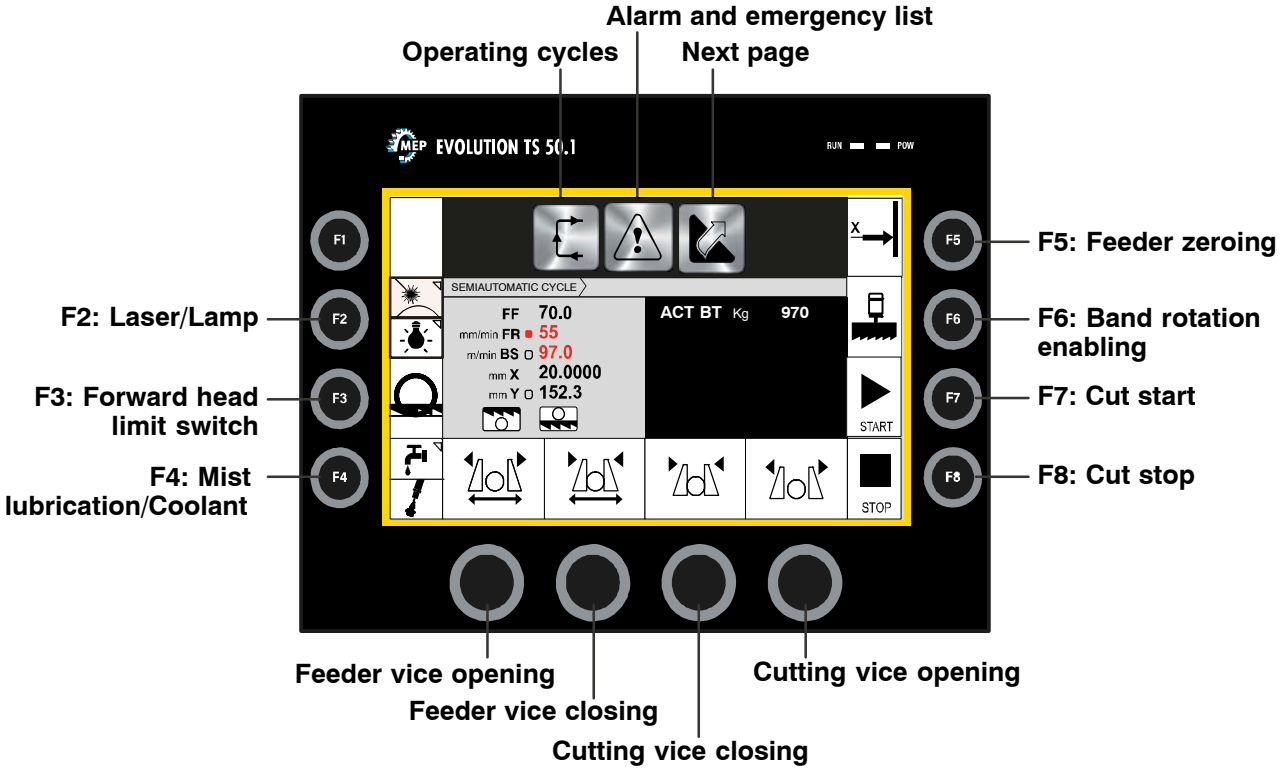
The grip of the manual head control lever incorporates a microswitch for manual control of the blade motor.



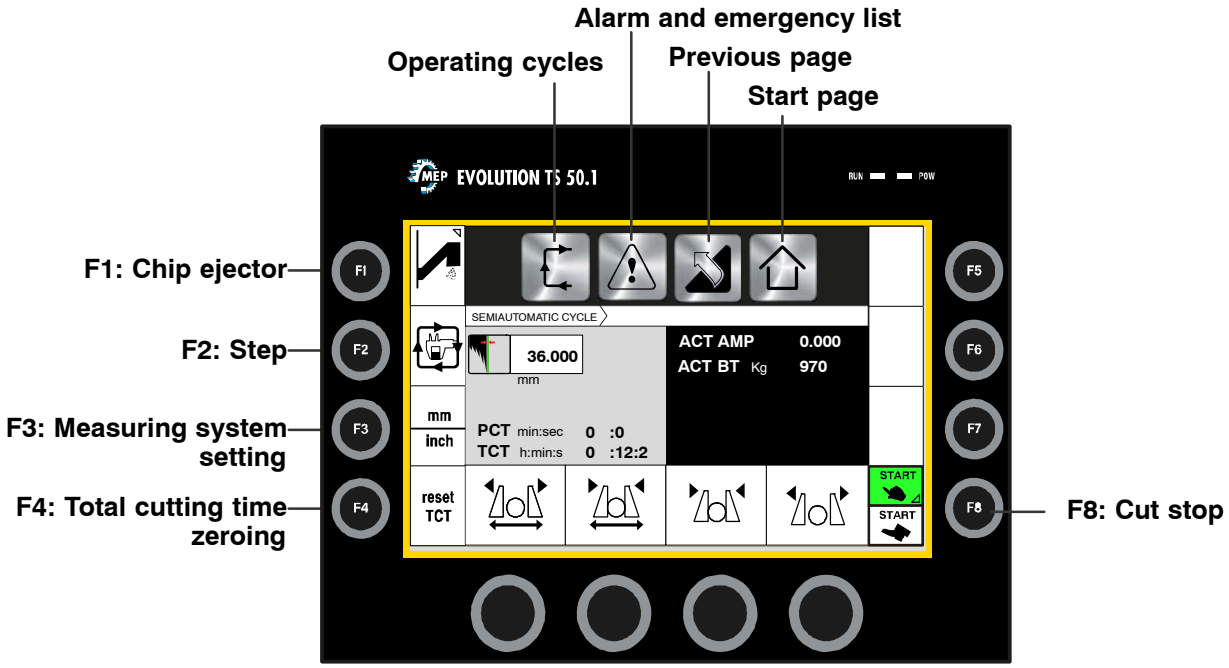
The microswitch is enabled when the machine is not in emergency state. In compliance with the relevant existing standards, voltage is 24V and the microswitch is installed in a housing (blue knob) sealed against external agents such as dust or moisture, with a protection rating of IP 55.

Symbol key

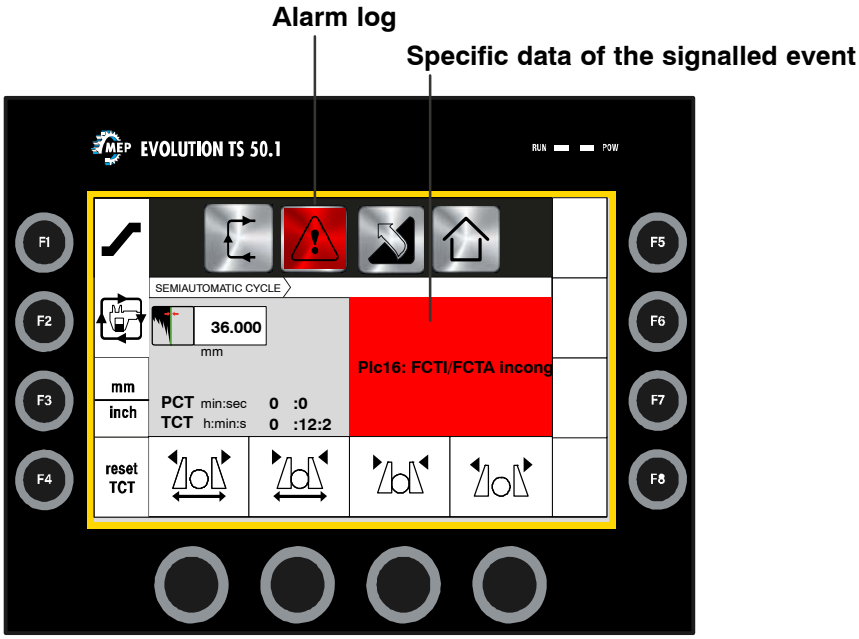
The key for the symbols used on the display follows.



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



If there is an alarm message, the system displays the alarm icon in red and a box where the text of the last recorded alarm is displayed.

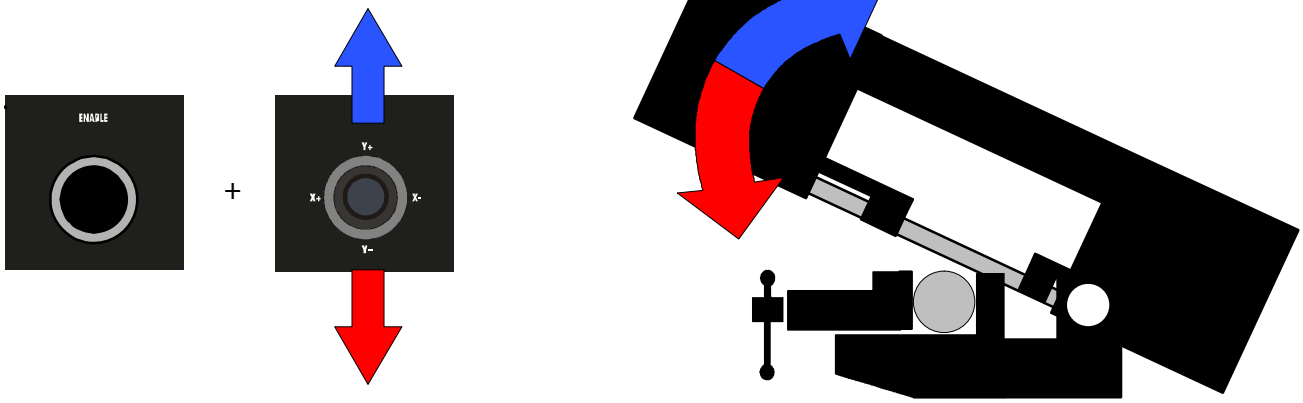


Pressing the red boxes you can access the alarm log as well as the characteristic data of the event occurred.

Basic instructions for carrying out a cutting operation cycle

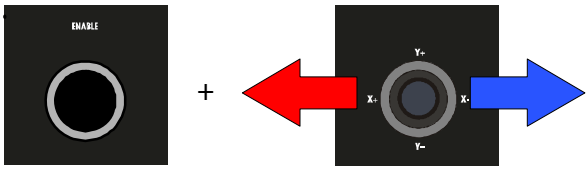
Moving the cutting head up and down

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.



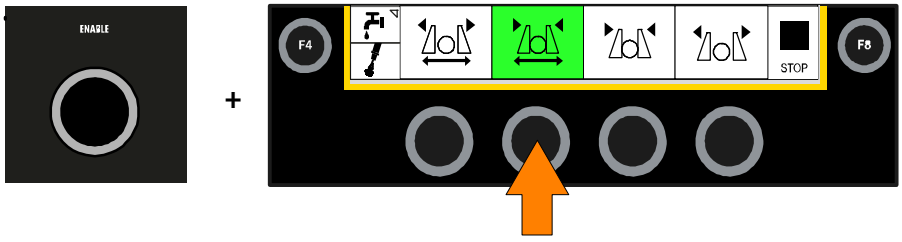
Manoeuvring the feeder

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.

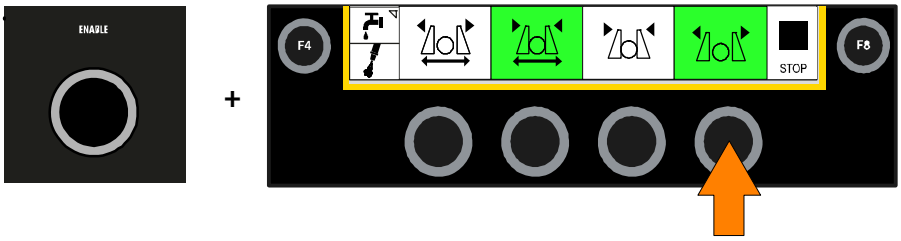


You can also move the material being processed using the joystick to position it at a preset height. The instructions are below:

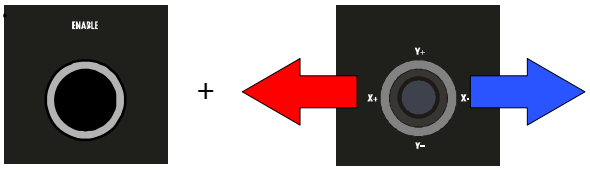
- ▶ Position the material inside the feeding vice.
- ▶ Close the feeding vice by holding the control enabling button and the vice closing button pressed at the same time.



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

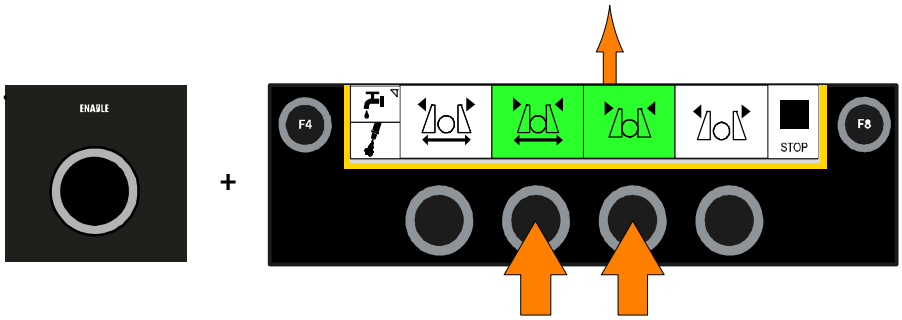


▶ Feed the material being processed to the preset height using the joystick and holding the control enabling key pressed. If the stroke is not sufficient repeat the operation for a new stroke.



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

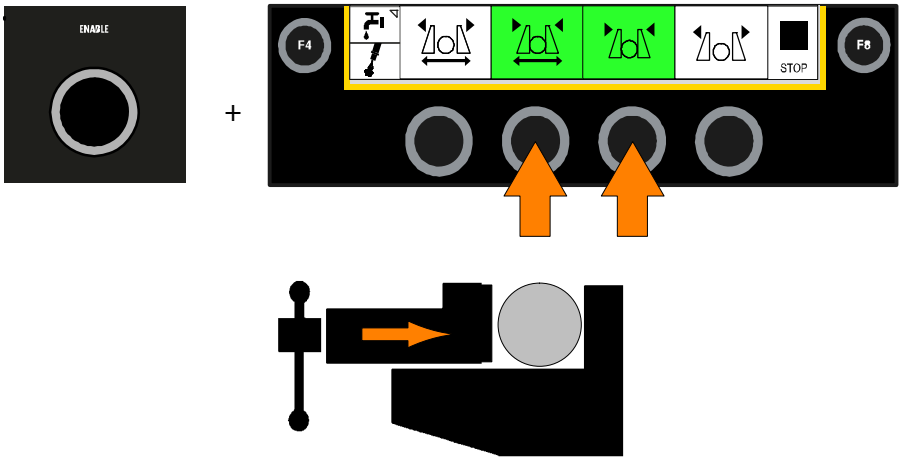
▶ Close the cutting vice by holding the control enabling button and the vice closing button pressed at the same time.



▶ Make the cut in the wished machining mode.

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.

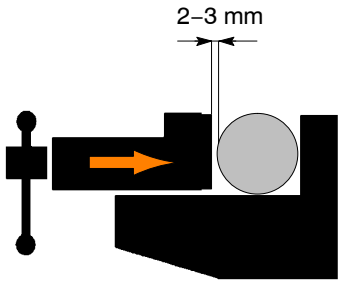


However, to ensure that the workpiece is securely clamped in the vice, proceed as follows:

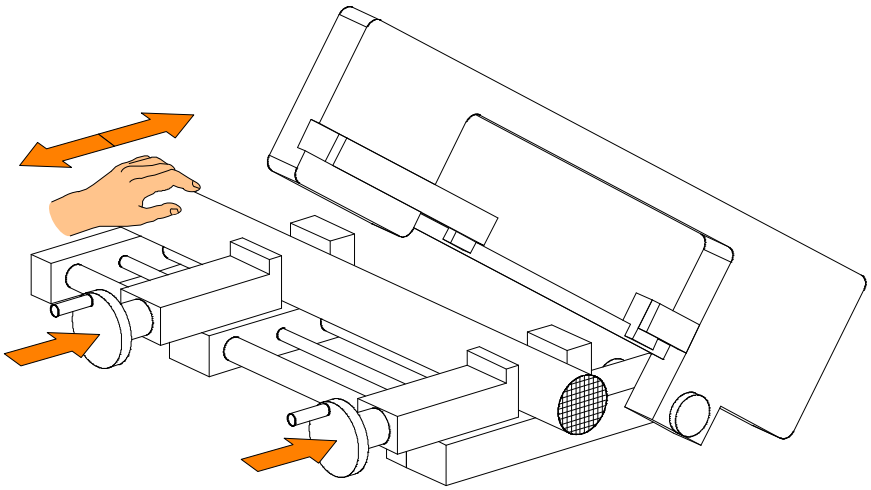
▶ make sure the workpiece dimensions do not exceed the machine's cutting capacity;

▶ 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.

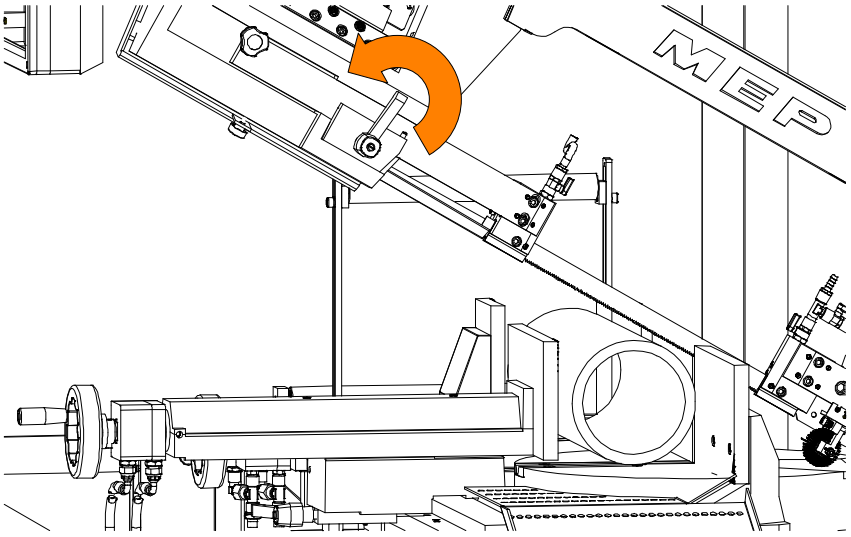


Width of cut

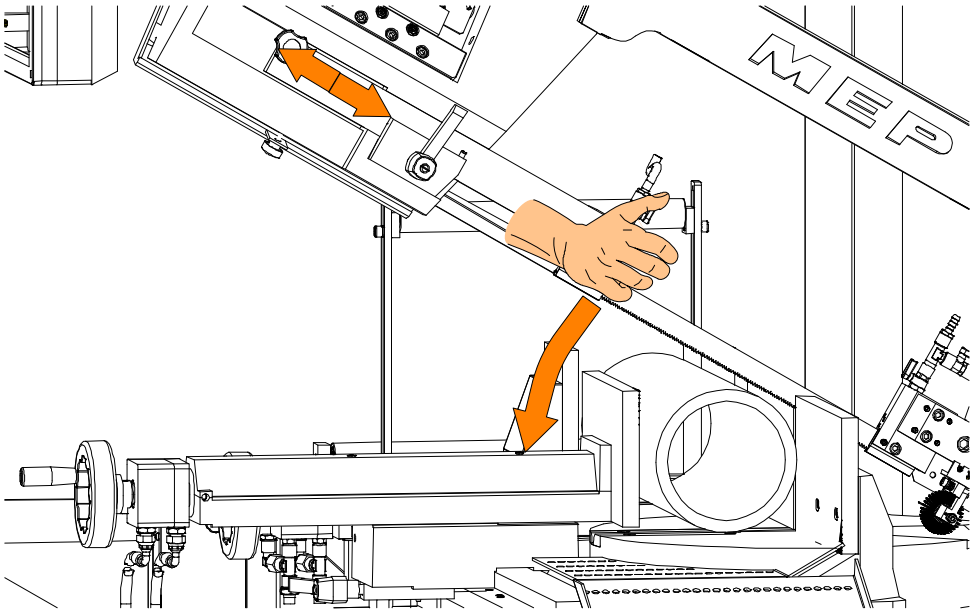
The machine is fitted with protections which protect the entire blade stroke, leaving exposed only the part of the blade required to make the cut itself as specified by current standards. The width of the cut is determined by the longitudinal section of the workpiece, so that only the part of the blade required to make the cut is actually exposed.

▶ Position the workpiece on the work table in proximity to the blade downstroke trajectory and clamp it in the vice.

▶ Slacken the ratchet lever on the sliding shaft of the front blade guide head.



▶ Position the mobile front guide head near the workpiece so that the downstroke trajectory exceeds the mobile vice jaw.



▶ Tighten the ratchet lever to lock the head slide.

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”.



Manual



Dynamic Semiautomatic



Semiautomatic



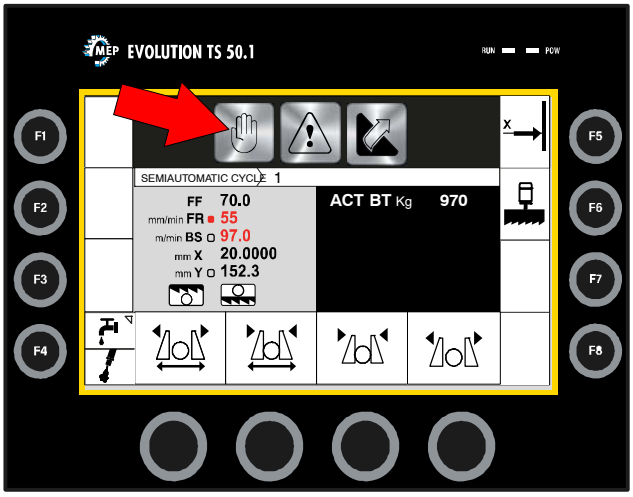
Automatic – Single program

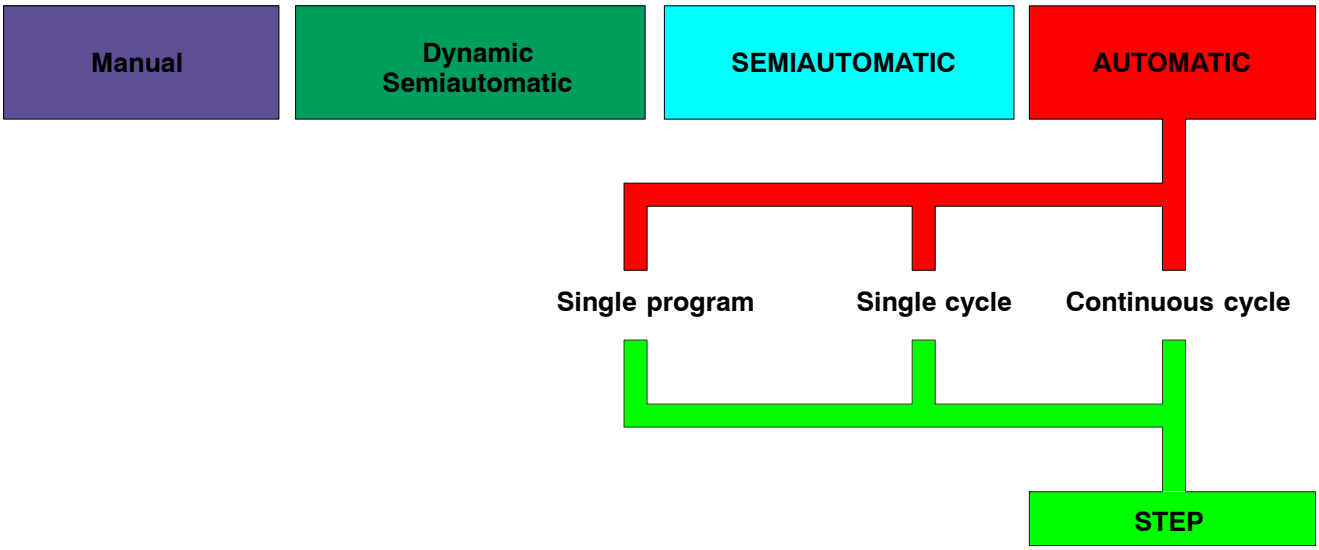


Automatic – Single cycle



Automatic – Continuous cycle





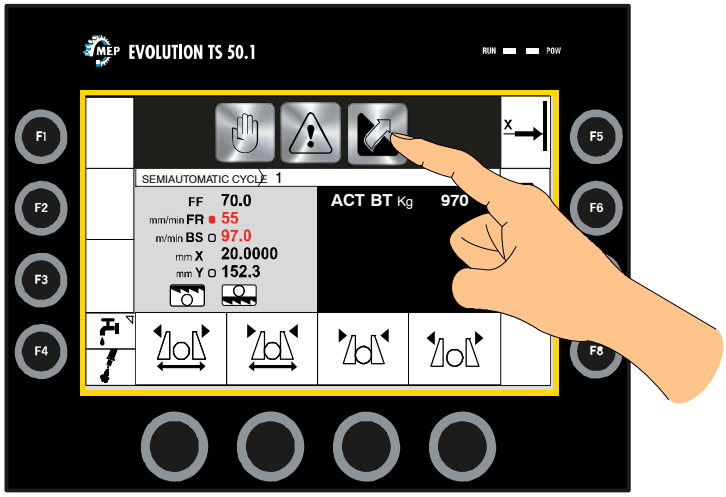
AUTOMATIC CYCLE

- 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.

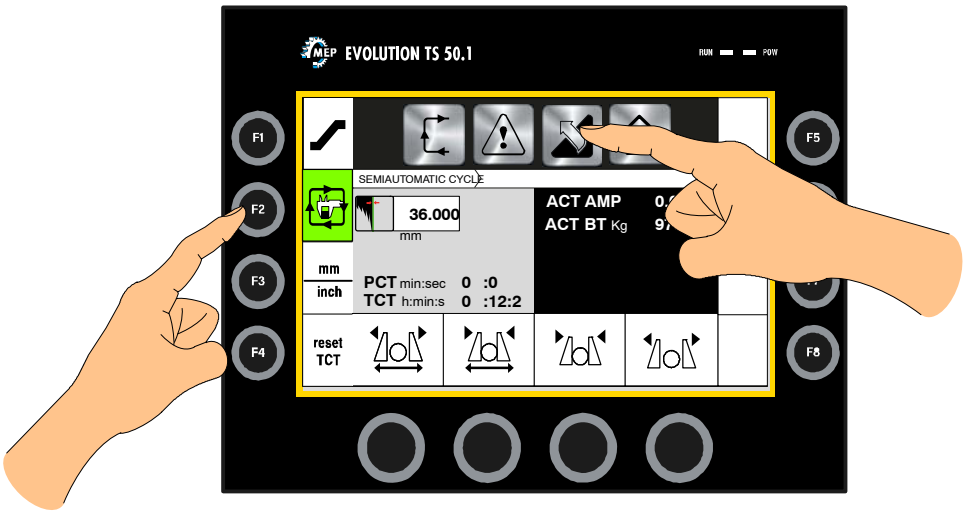
UTILITY STEP

- 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 “F2 – 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).

Preliminary check list for cutting operation

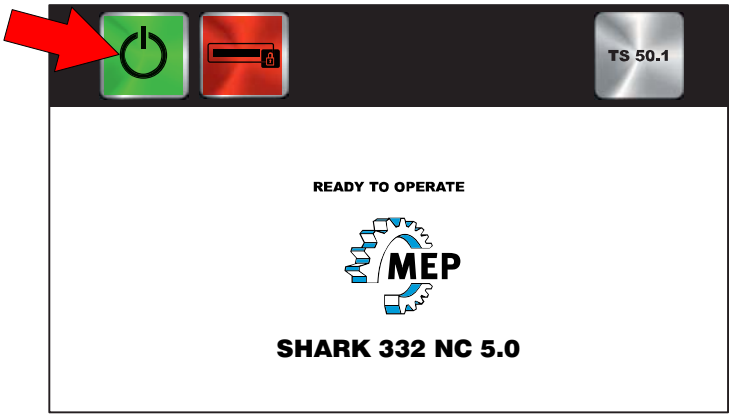
To guarantee complete safety during cutting cycles, the operator should work through a check list of the entire apparatus, checking:

- blade tension;
- that the blade guide head bracket is locked in the correct position;
- that the cutting angle is correct and the cutting head is locked;
- that the work piece is properly clamped in place;
- that the blade teeth are correct for the job to be begun;
- that the speed selected is right for the kind of piece to be cut;
- that all protections are in place and correctly locked;
- the level of lubricant/coolant and that the electropump is activated;
- that the blade downstroke speed and cutting pressure are correct.

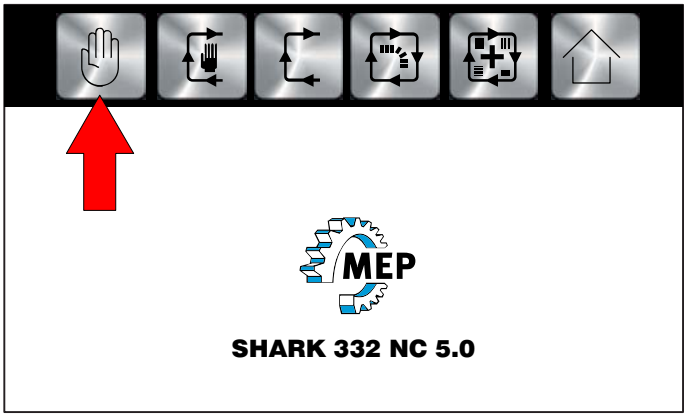
Starting up the machine

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

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

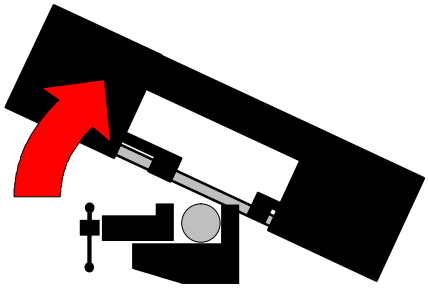


▶ choose a machining cycle pressing the relevant key on the console;



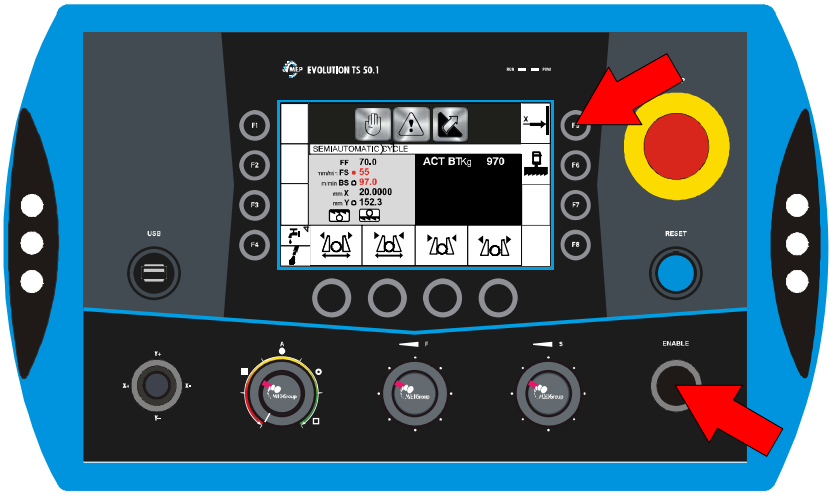
▶ release the emergency mushroom button if pressed, then press the RESET button: the head rises completely up.





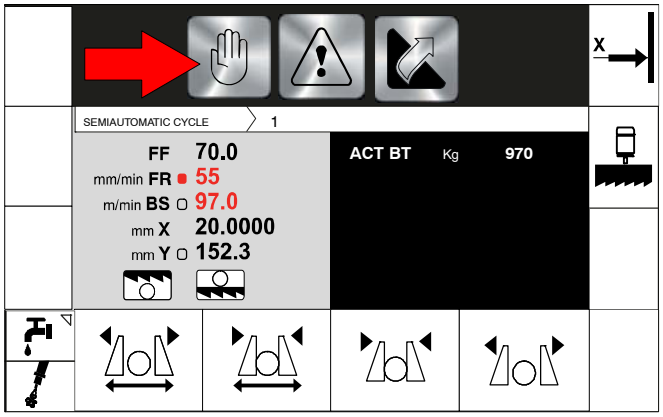
N.B. The above described procedure must always be followed before starting the work with the sawing machine.

▶ Set the feeder to zero by pressing, in sequence and simultaneously, the control enabling keys and the F5 key shown in the figure.



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.

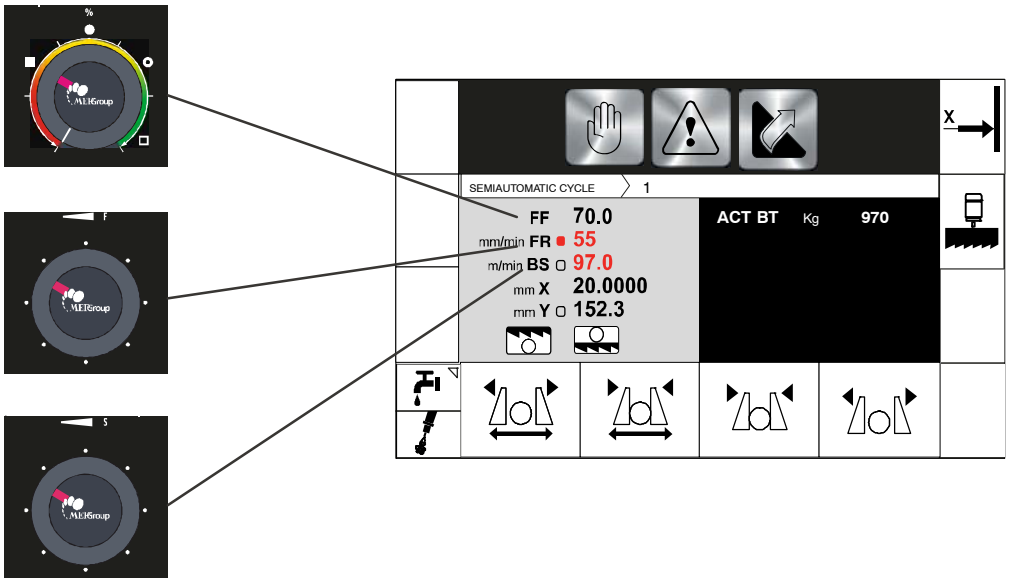
▶ After the initialization of the sawing machine the display shows the following screen. Press the box shown in the figure until the symbol of the wished cycle is displayed.



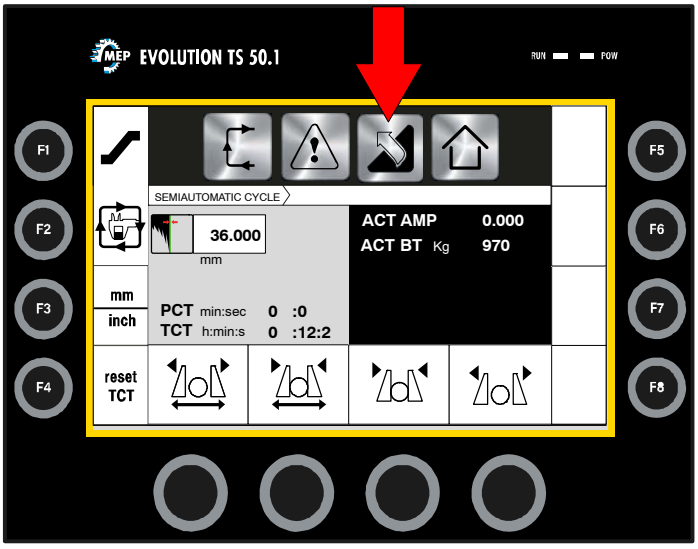
The available working cycles are: manual, dynamic semiautomatic, semiautomatic, automatic with single program, automatic with single cycle and automatic with continuous cycle.
In the manual cycle the cutting only involves the setting of the rear head limit switches (RHLS) and forward head limit switches (FHLS); then, after having positioned the material at the wished cutting length, start by the Cut start key (F7).

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.
BS = Blade Speed, value of the band rotation speed that can be set through the

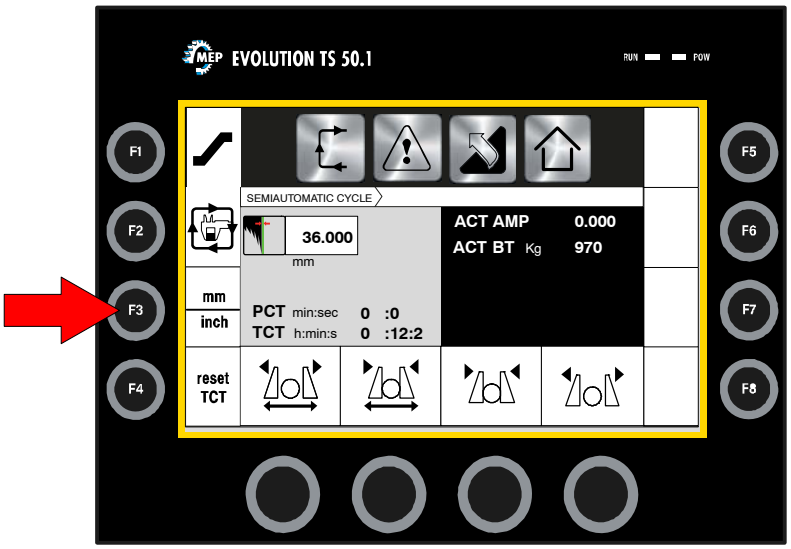
potentiometer from the control board.



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



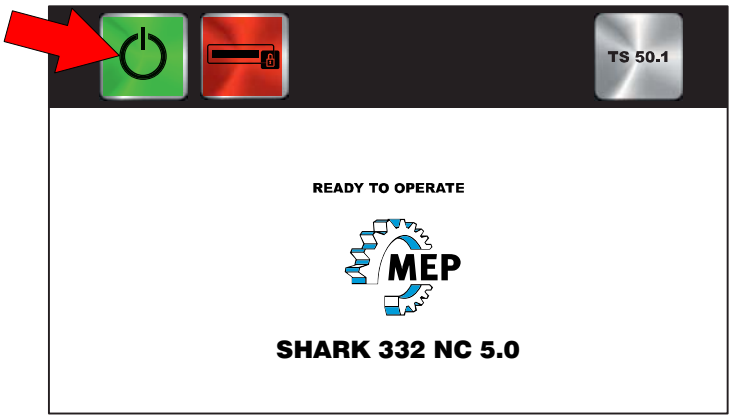
N.B. Pressing the key (F3) shown in the figure the decimal metric measuring system or the Imperial measuring system can be set.



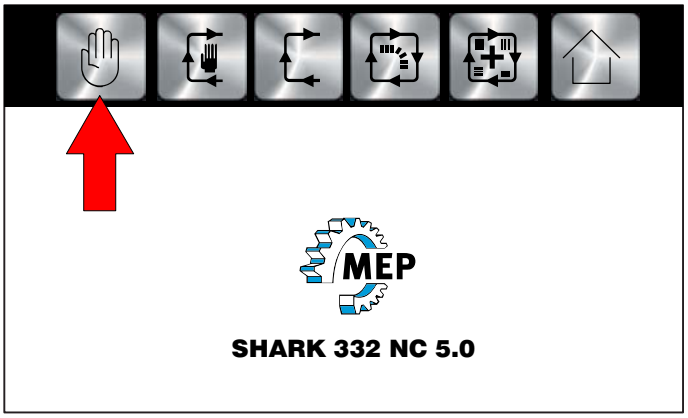
Manual operating cycle

The operation sequence for running a manual cutting cycle:

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



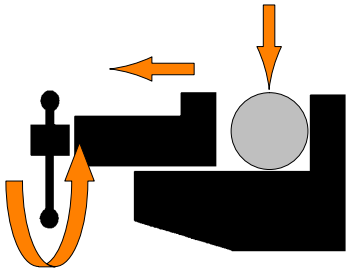
- ▶ Select the manual machining mode, pressing the box shown in the figure on the touch screen.



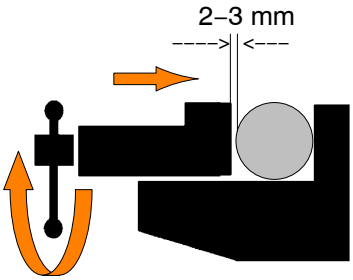
- ▶ Release the emergency mushroom button if pressed, then press the RESET button.



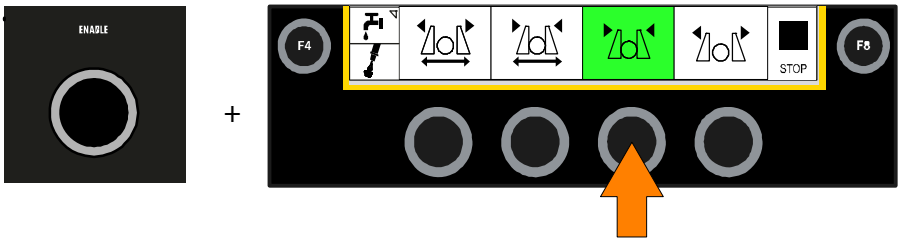
▶ Open the vice by turning the handwheel counter−clockwise and then position the material to be cut between the jaws.



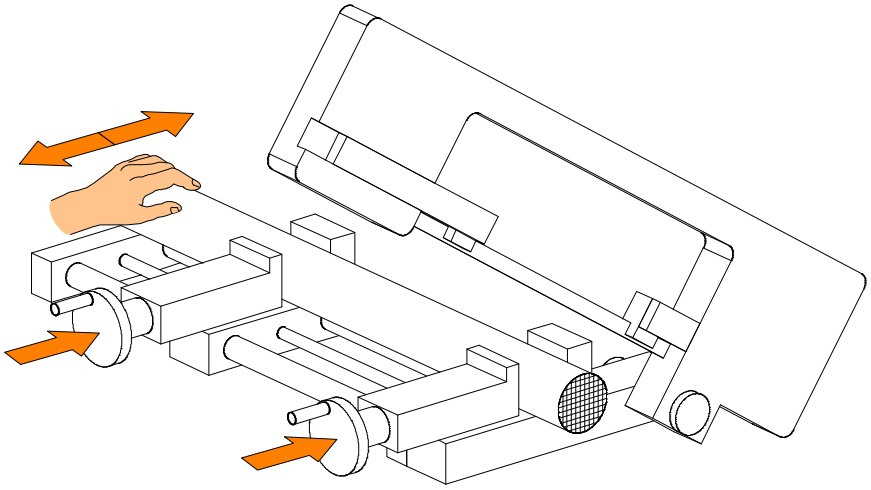
▶ Bring the moveable jaw to within 2÷3 mm of the workpiece by rotating the handwheel clockwise.



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

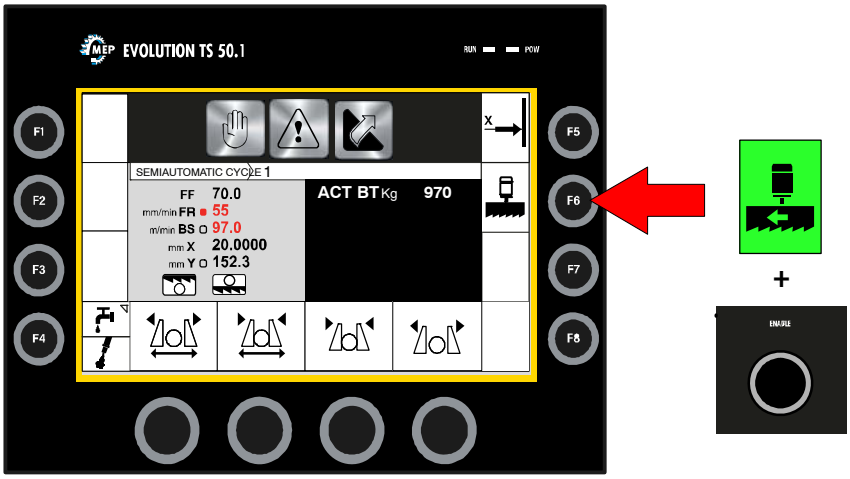


▶ Make sure the workpiece is effectively locked in place, repeating the operation if it is not!

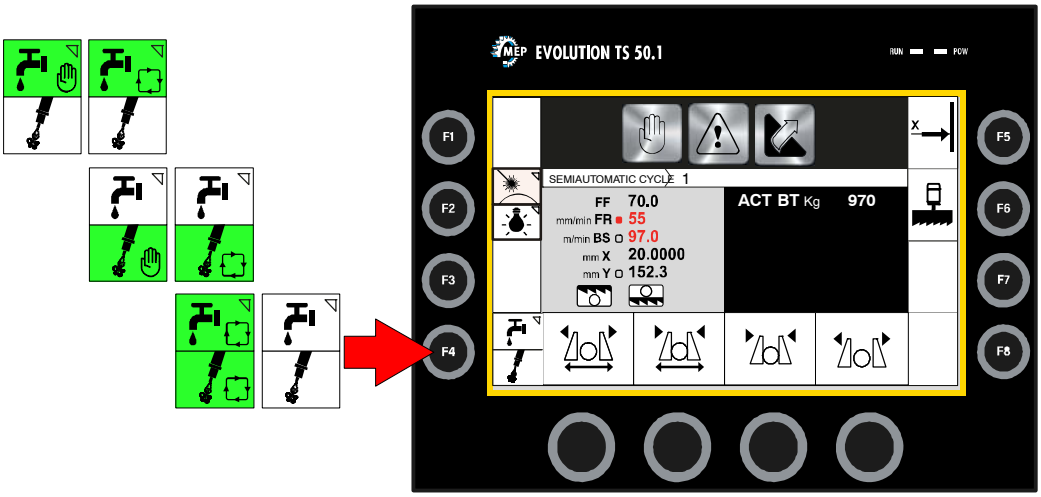


N.B. The piece can seem not locked as the vice is already in the closing position through the hydraulic piston. Thus, the operation must be repeated, namely: open the vice by the suitable push button, approach the movable jaws to the piece further and lock again by the closing push button, considering that the stroke of the hydraulic piston is about 6 mm

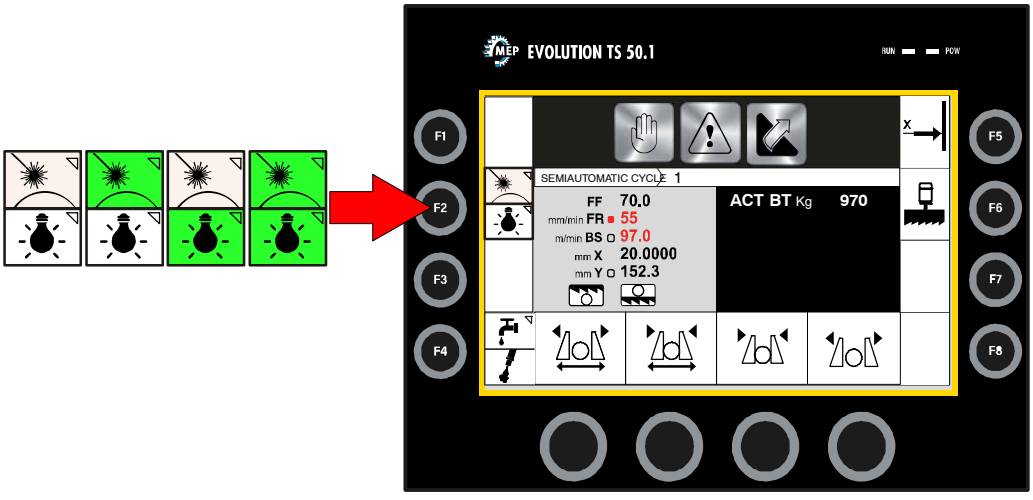
▶ Hold the control enabling key and the band rotation enabling key (F6) pressed at the same time.



▶ 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).



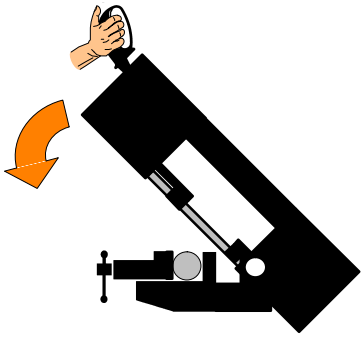
N.B. The machine can be equipped with a lamp for lighting the working table and with a laser projector (optional) to aid the machine positioning under the blade vertical. These options can be selected by pressing once or more times the same key (F2) on the icon left.



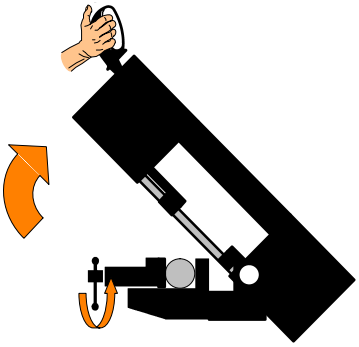
- Set the band rotation speed depending on the characteristics of the material to be cut



- The head downstroke speed potentiometer is automatically excluded when selecting manual cycle and therefore no adjustment is required.
- After having clamped the material and carried out the selections described, you may cut in manual.
- Grab the handle and press the trigger switch so as to start blade motor.

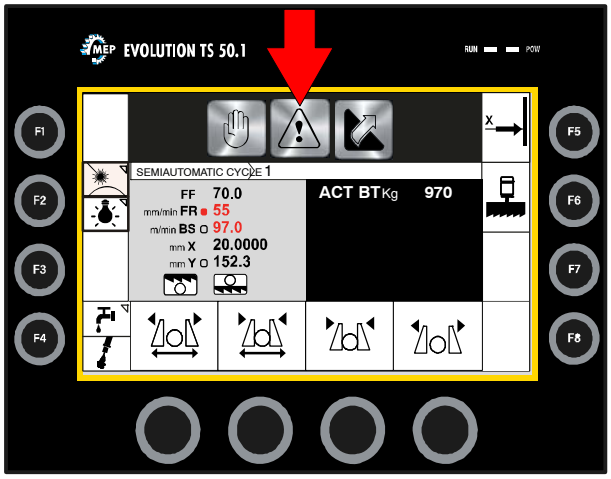


- At the end of the cut bring the head back up to top position.



- You may now loosen the piece cut by means of the button to open/close vice or by turning manually the vice handwheel.

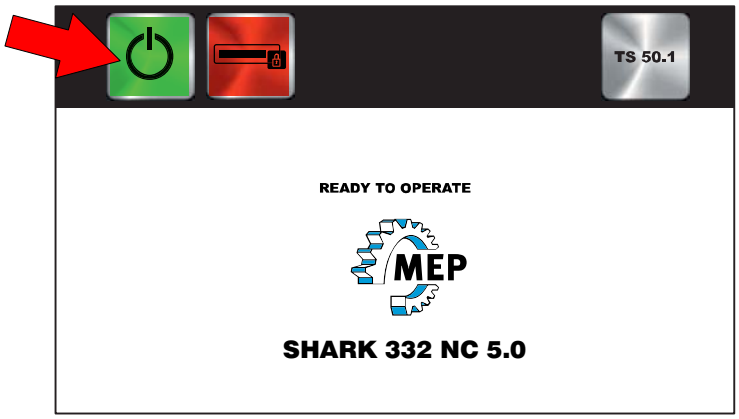
N.B. Tap on the touchscreen box shown in the figure to see problems during operation. The box will turn blue to indicate caution and red to indicate a machine alarm. See chapter 10 for a complete list of alarms.



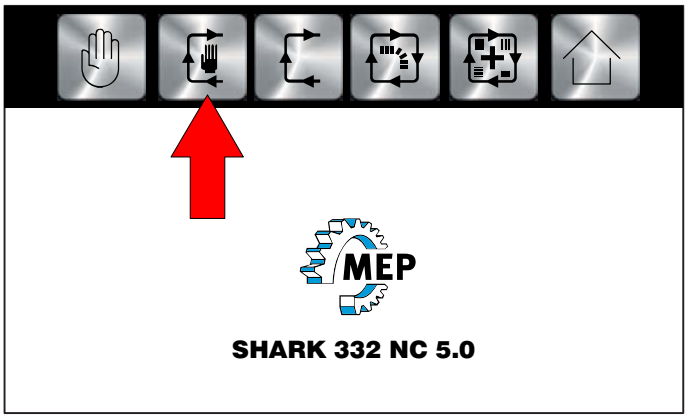
Dynamic–semiautomatic operating mode

Sequence of operations for a dynamic semi–automatic cut:

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

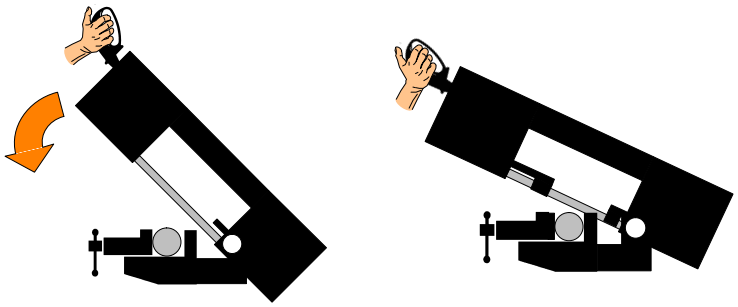


- Select the dynamic semiautomatic working mode, pressing the box shown in the figure on the touch screen.



Tighten the workpiece and prepare it for the cut as indicated in the previous section “Manual cycle”.

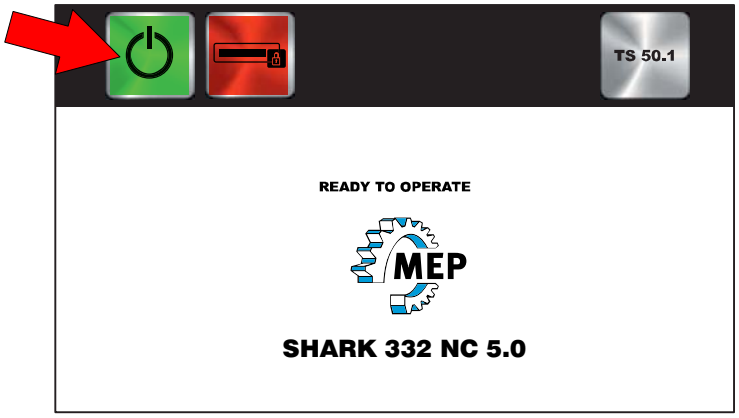
The dynamic–semiautomatic cycle differs from the semiautomatic cycle because it includes the possibility of approaching the cutting head manually to the piece, with the bow completely free, and to start the cutting cycle using the grip. The machine carries out all the operations of the semiautomatic cycle described in the following paragraph.



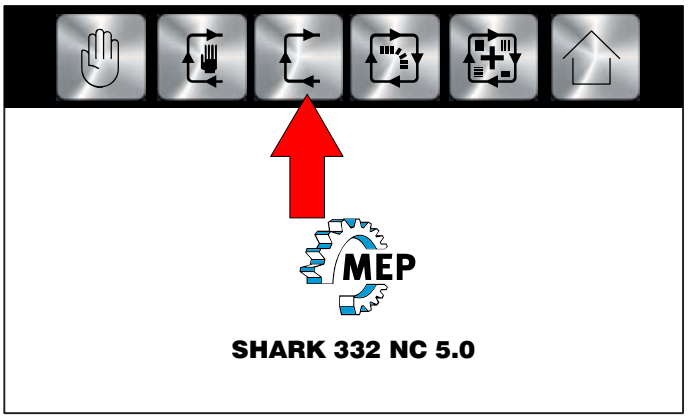
Semi–automatic operating cycle

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.

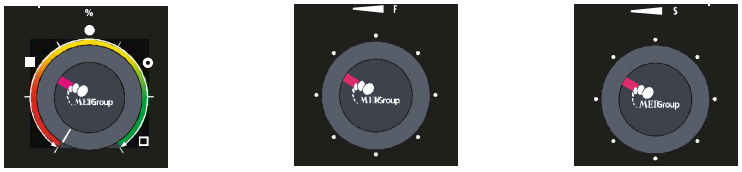


- Release the emergency mushroom button if pressed, then press the RESET button.

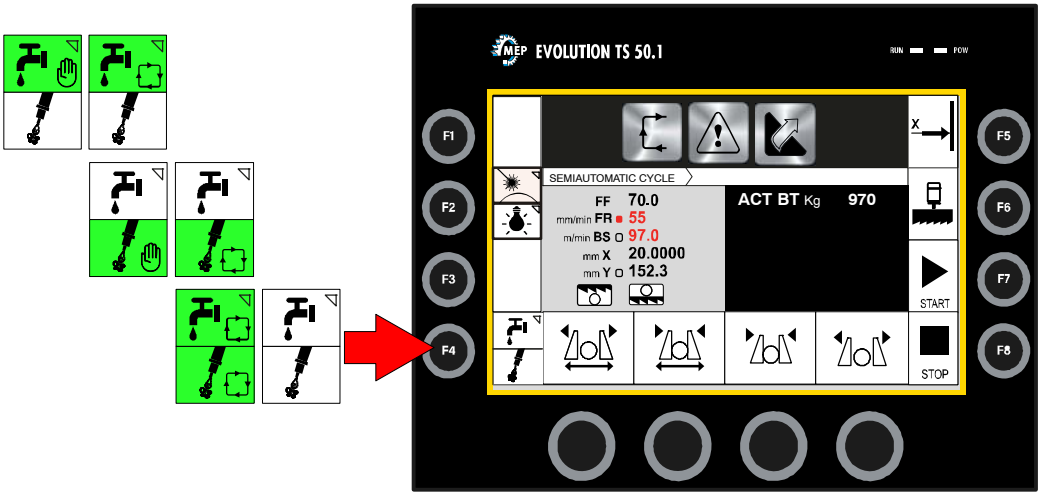


▶ Set the cutting parameters, previously shown, using the following adjusters.

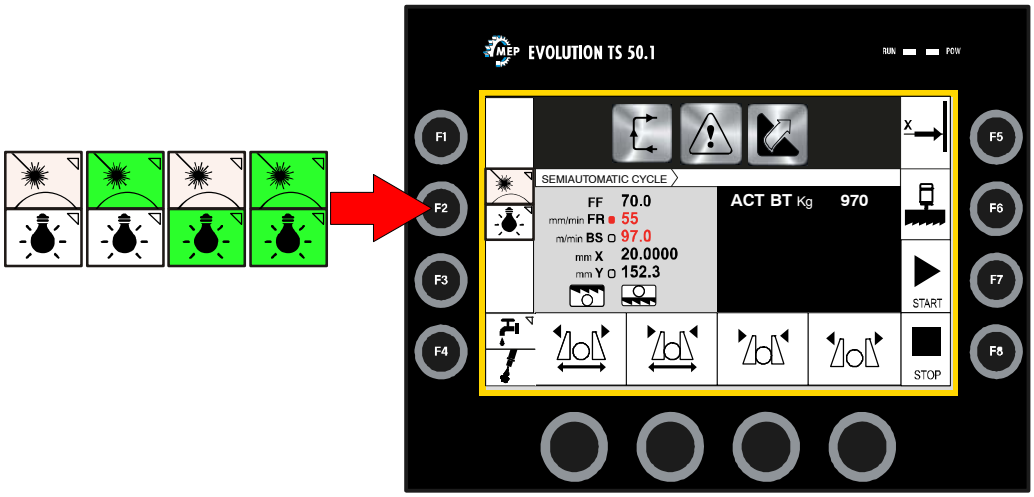
Attention In this step it is recommended to set the head lower adjuster at the min. value, to prevent the head from lowering too fast breaking the blade.



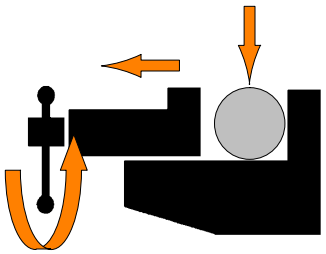
▶ Set the fluid jet by pressing the button shown in the figure (F4). The box will light up to indicate that it is selected. Adjust the amount using the valves on the blade guide head. Press the button repeatedly to select the dispensing mode (automatic or manual).



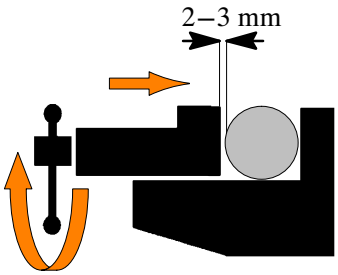
N.B. The machine can be equipped with a lamp for lighting the working table and with a laser projector (optional) to aid the machine positioning under the blade vertical. These options can be selected by pressing once or more times the same key (F2) on the icon left.



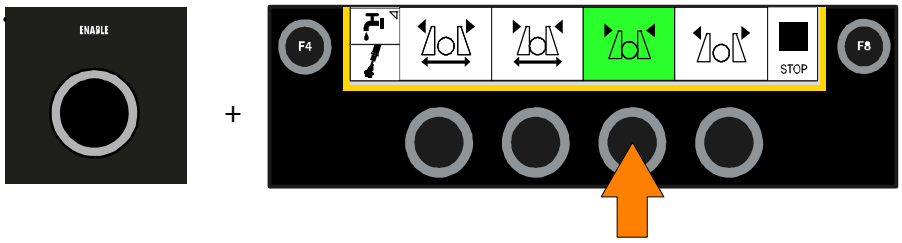
▶ Open the vice by rotating the handwheel anti−clockwise and position the workpiece between the jaws.



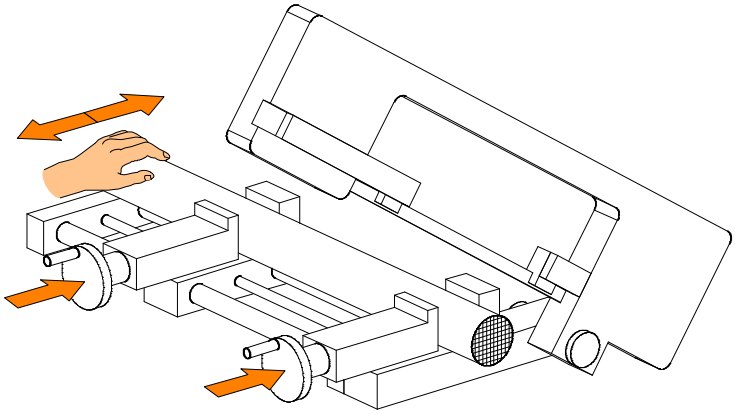
▶ Bring the moveable jaw to within 2÷3 mm of the workpiece by rotating the handwheel clockwise.



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



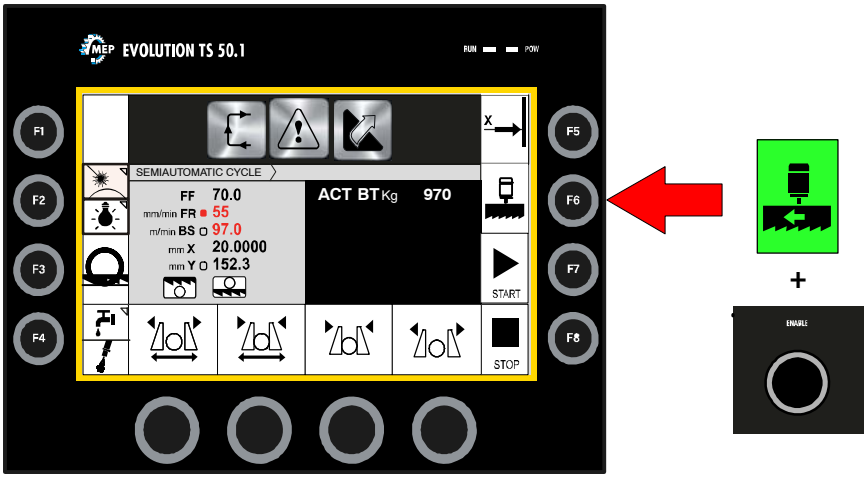
▶ Check that the workpiece is effectively locked in positon!



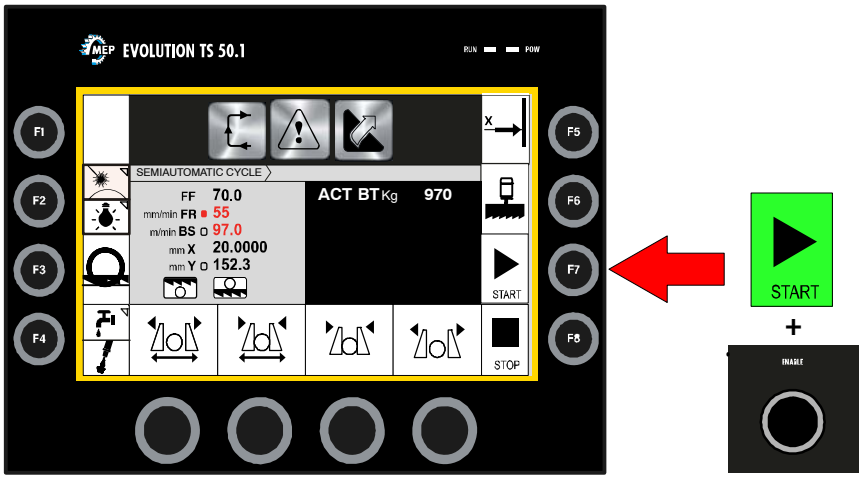
N.B. The piece can seem not locked as the vice is already in the closing position through the hydraulic piston. Thus, the operation must be repeated, namely: open the vice by the suitable push button, approach the movable jaws to the piece further and lock again by the closing push button, considering that the stroke of the hydraulic piston is about 6 mm

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

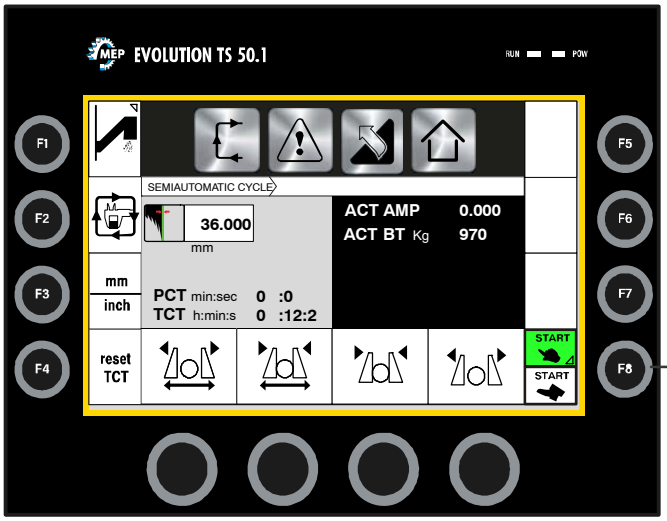
▶ Hold the control enabling key and the band rotation enabling key (F6) pressed at the same time.



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

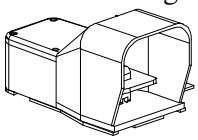


N.B. If the sawing machine is equipped with optional pedal board the cycle start can be controlled remotely. In this case, it is necessary to carry out two operations:
– enable the pedal board by activating the relevant item in the option list, as explained in Chapter 11 of this manual;
– choose the start from pedal board in the second page of the working cycle.



F8: Cut stop

▶ Press the pedal control to start the working cycle.



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

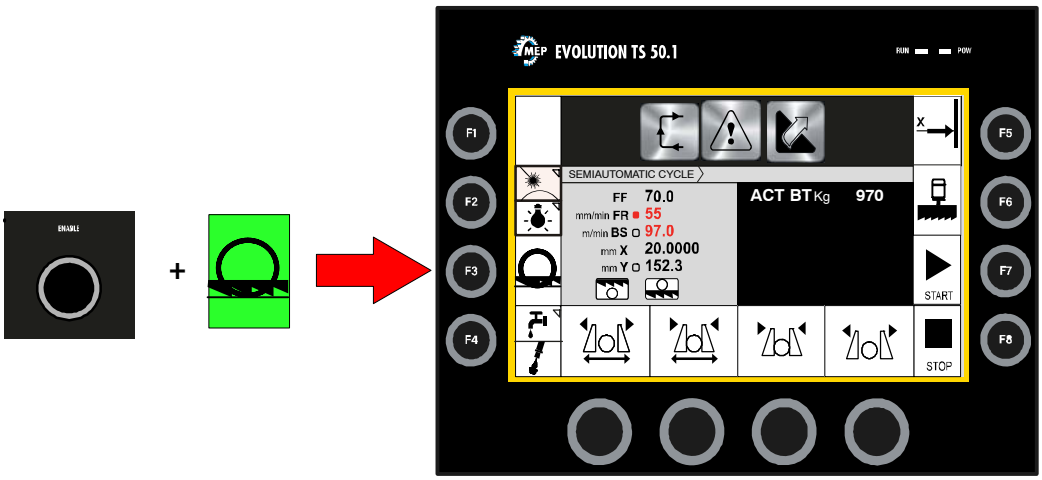






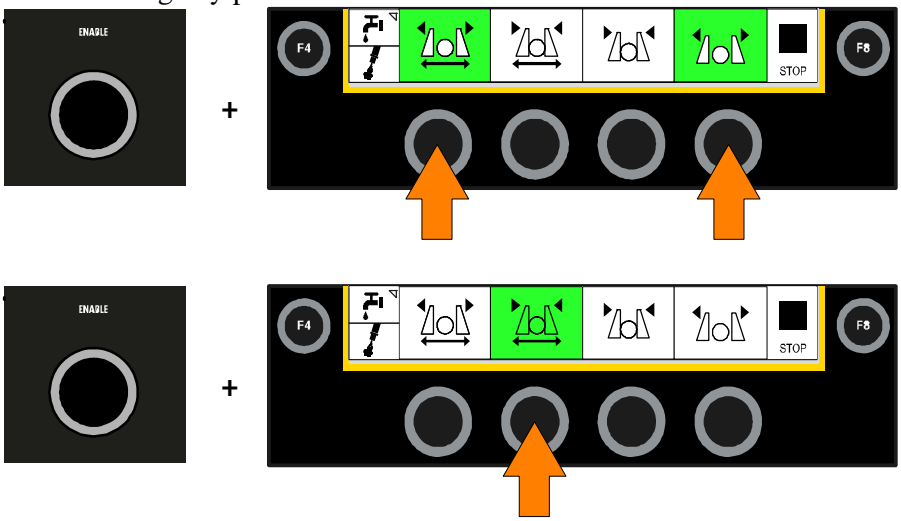
Now the blade starts, the cutting cylinder is under pressure and the lubricant/coolant supply starts.

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.

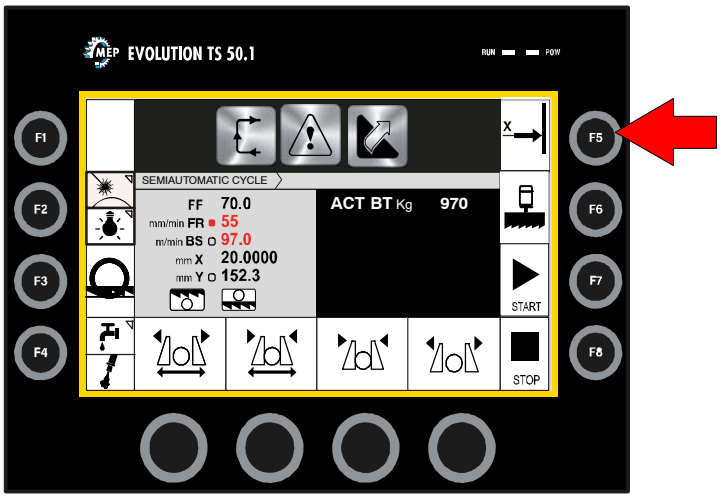


▶ When the head reaches the FHLS point the band stops and the head returns to the set RHLS point, ready to make a new cutting cycle.

▶ 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.

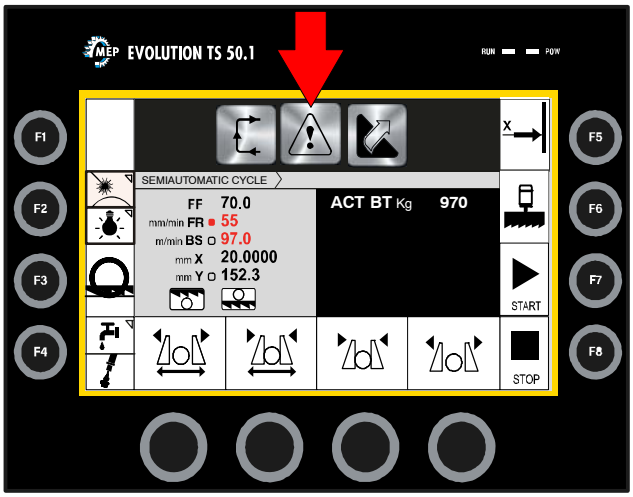


N.B. The sawing machine zeroes the feeder shuttle when the automatic cycles are started. If the feeder must be zeroed before the cycle start, select the semi–automatic working cycle and zero by pressing the control enabling key and the F5 key shown in the figure at the same time.



Warning

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.



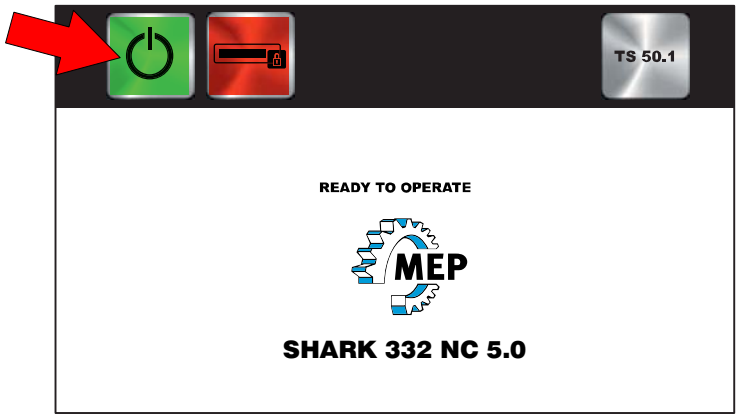
Automatic mode single job

- 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.

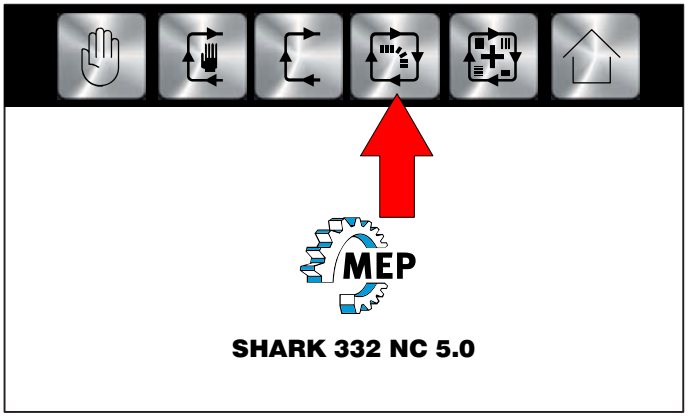
The operation sequence for running in automatic mode and single job:

▶ power up the machine by turning the main switch;

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



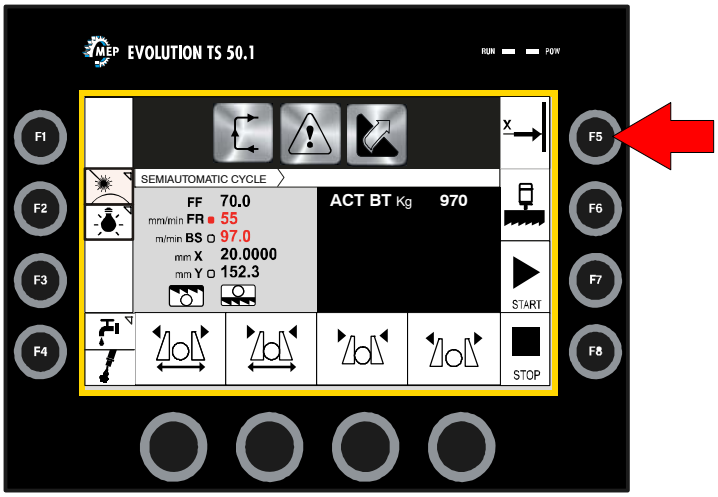
▶ Select the automatic – Single program working mode, pressing the box shown in the figure on the touch screen.



▶ release the emergency mushroom button if pressed, then press the RESET button.

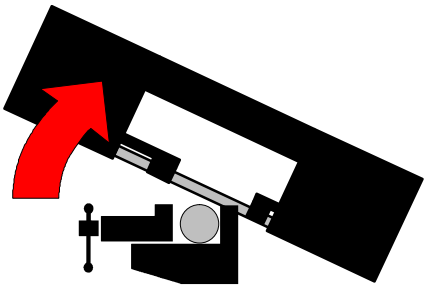


N.B. The sawing machine zeroes the feeder shuttle when the automatic cycles are started. If the feeder must be zeroed before the cycle start, select the semi–automatic working cycle and zero by pressing the control enabling key and the F5 key shown in the figure at the same time.



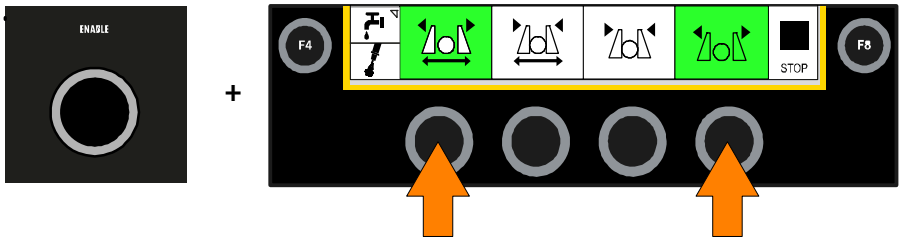
▶ Completely lift the cutting bow using the joystick (Y+), and pressing the ENABLE button at the same time.



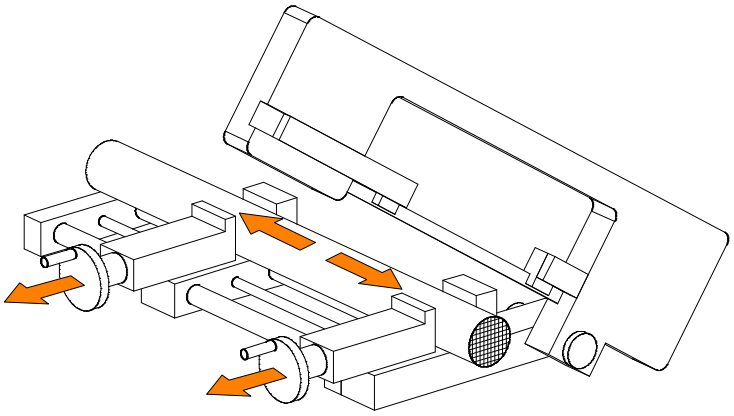


Warning The head lifting completely up is recommended to avoid the accidental contact between the material and the blade during the insertion inside the vices.

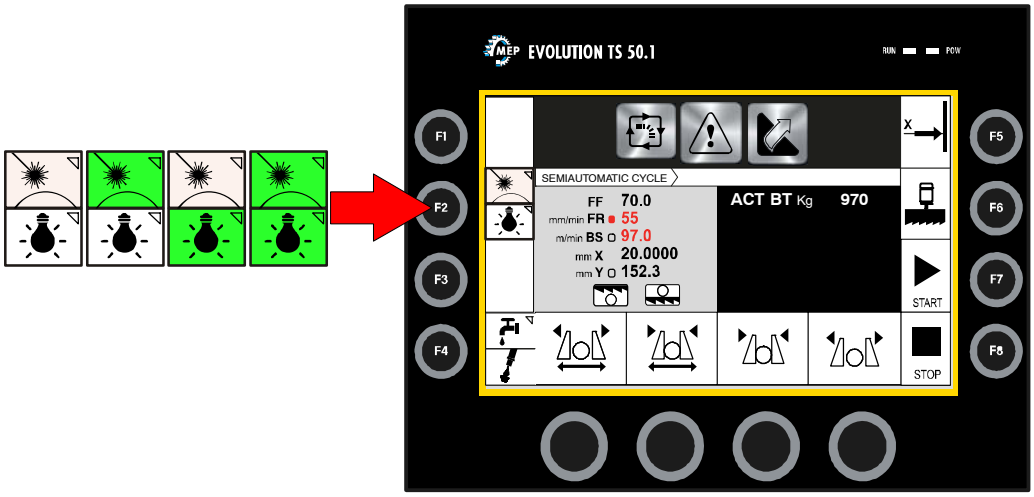
▶ Open the cutting and feeding vices holding the control enabling key and the relevant buttons on the keyboard pressed at the same time.



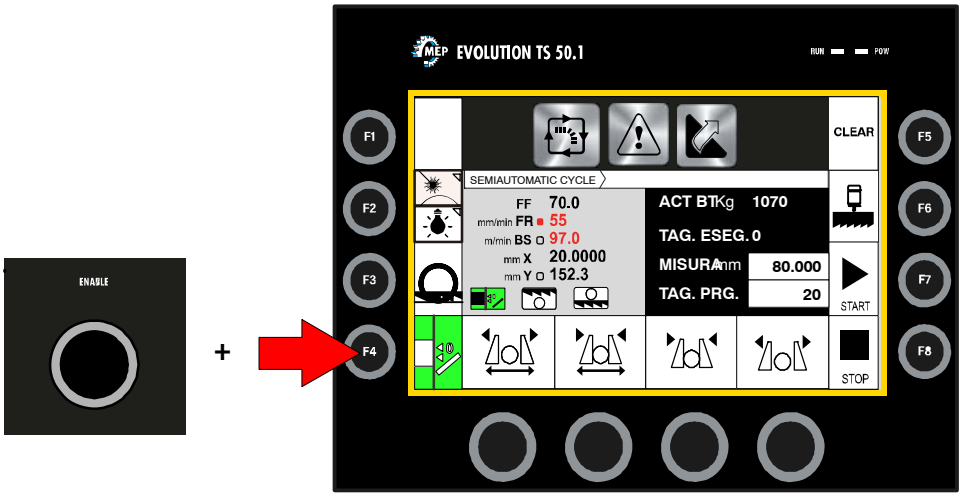
▶ Open the cutting and feeding vices using the flywheels, then insert the material being processed positioning it under the blade vertical, ready for the facing cut.



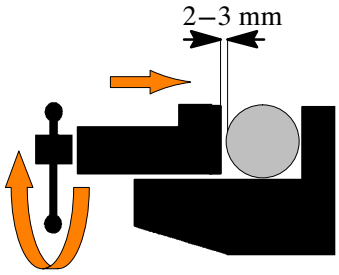
N.B. The machine can be equipped with the laser−lamp accessory to illuminate the working table and to make the material positioning under the blade vertical easier. Pressing the F2 key several times you can choose either or both.



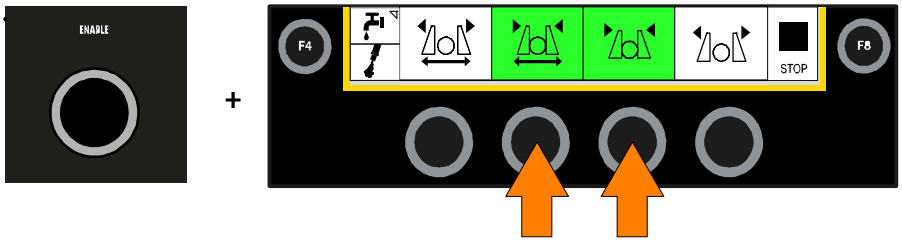
Warning In the standard automatic operation the sawing machine never counts the first cut, as it is considered as a bar facing scrap. To exclude this function, deactivate it pressing the ENABLE + F4 keys in sequence and at the same time. To re−activate it, use the same control.



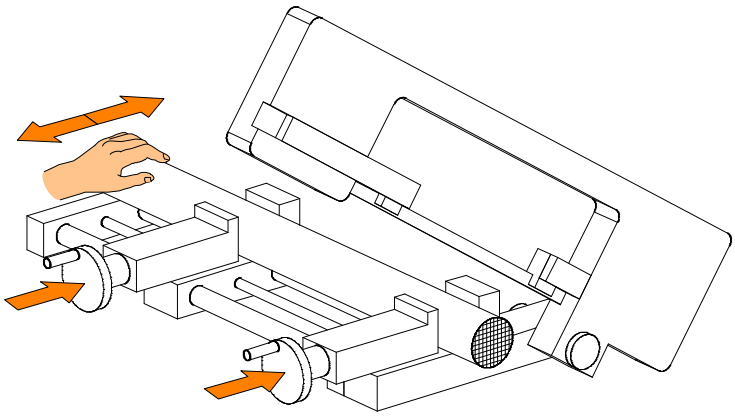
▶ Close the feeding and cutting vices rotating the flywheel clockwise, approaching the movable jaws at 2÷3 mm from the material to be cut.



▶ Close both vices by holding the control enable button and the vice closing buttons pressed in sequence and at the same time.

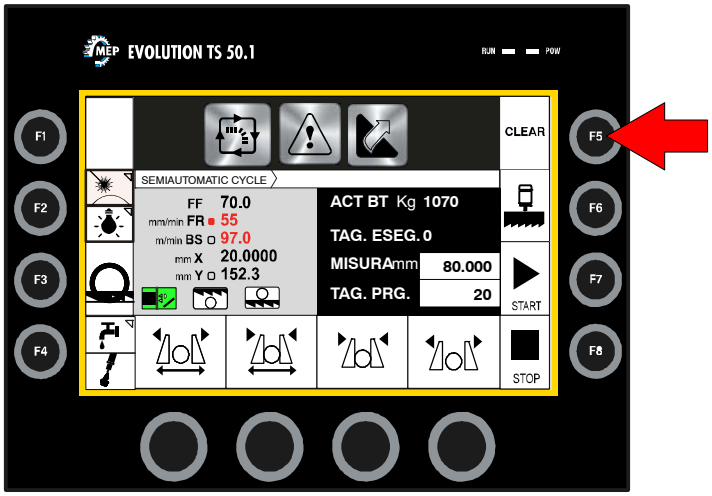


Attention Check that the workpiece is effectively locked in positon!

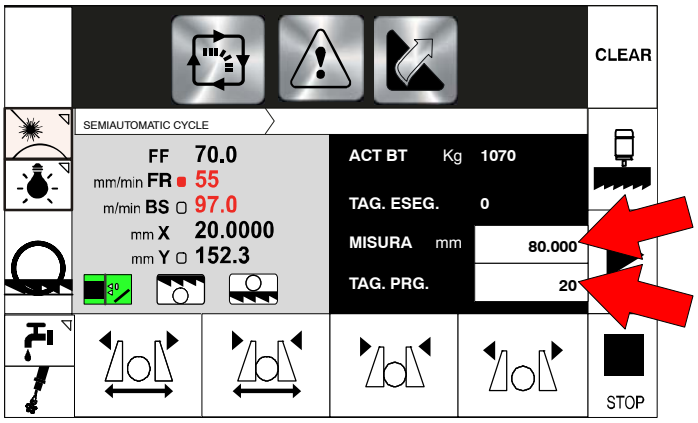


N.B. The piece can seem not locked as the vice is already in the closing position through the hydraulic piston. Thus, the operation must be repeated, namely: open the vice by the suitable push button, approach the movable jaws to the piece further and lock again by the closing push button, considering that the stroke of the hydraulic piston is about 6 mm

▶ 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.

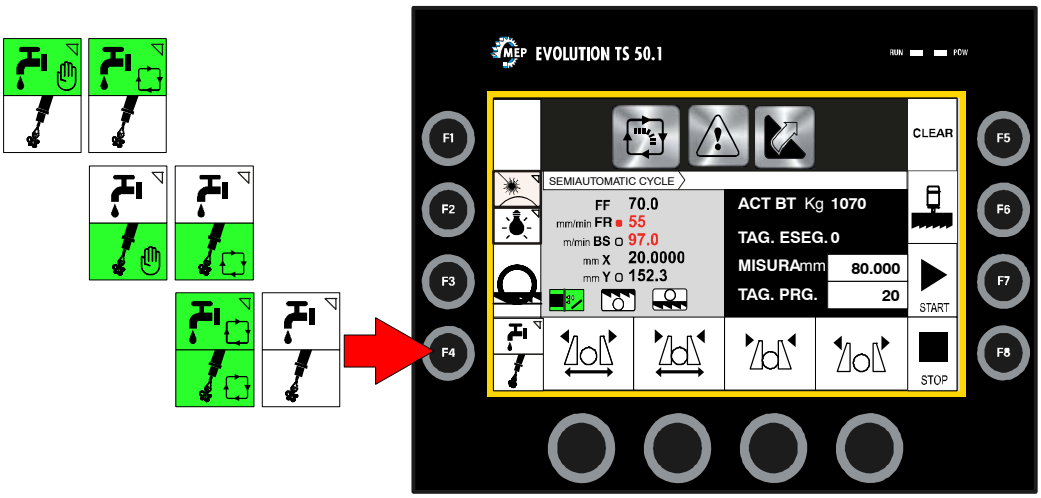


▶ Set the cutting parameters, previously shown, using the following adjusters.

Attention 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.

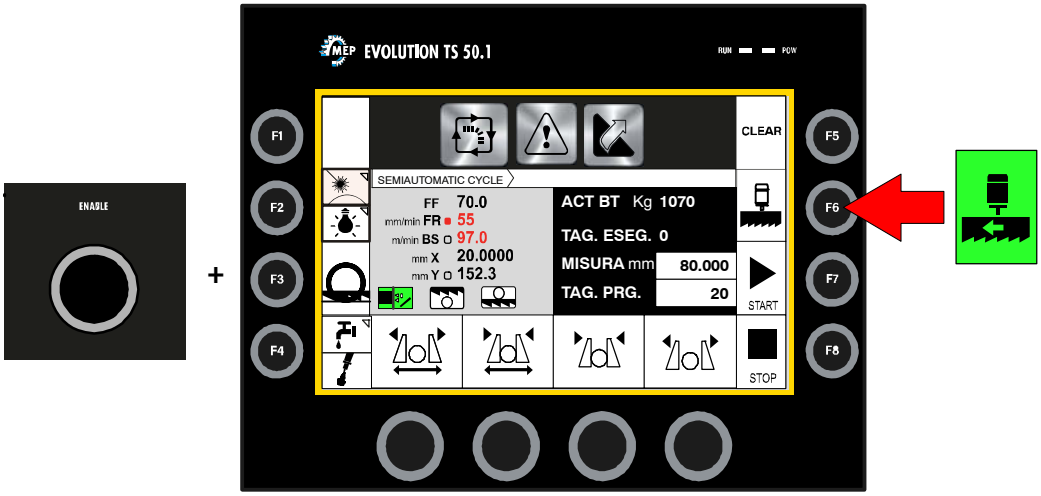


▶ Set the fluid jet by pressing the button shown in the figure (F4). The box will light up to indicate that it is selected. Adjust the amount using the valves on the blade guide head. Press the button repeatedly to select the dispensing mode (automatic or manual).

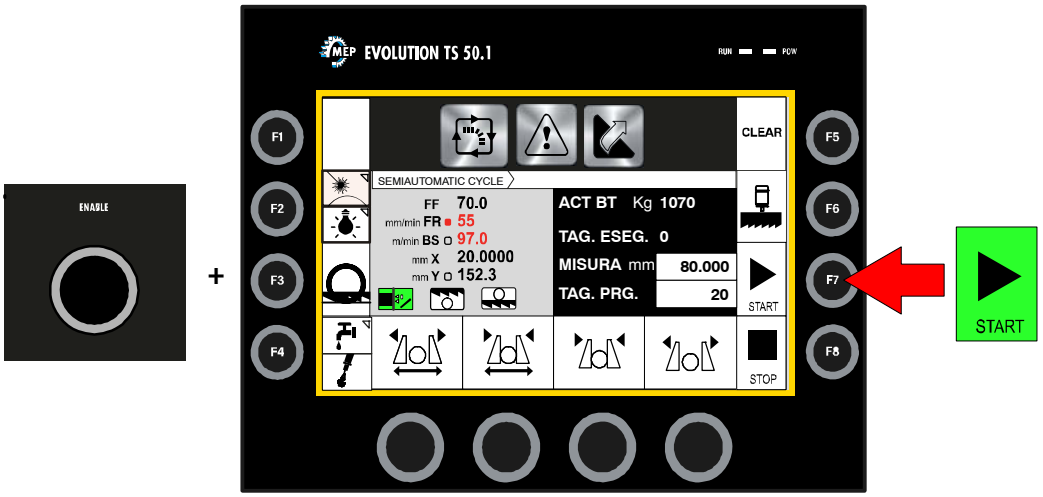


▶ Position the head at approximately 10 mm from the workpiece.

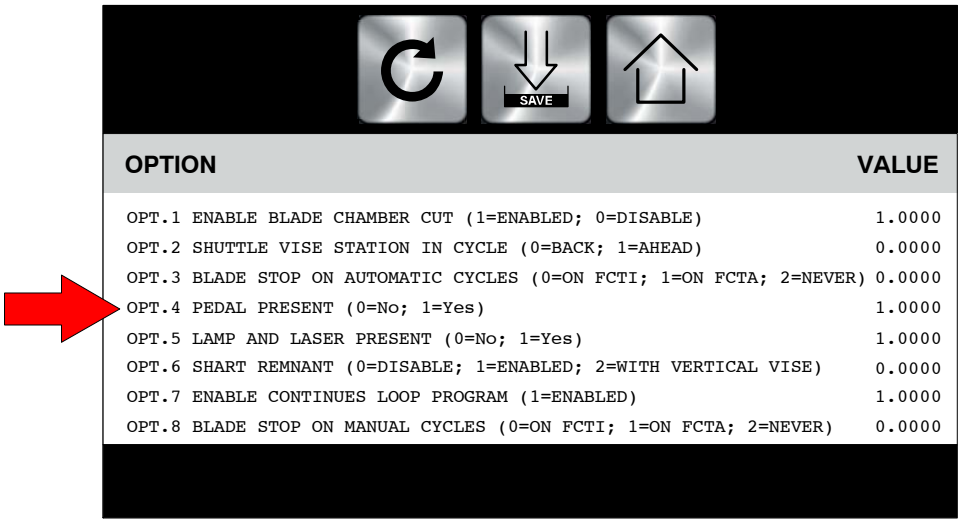
▶ Hold the control enabling key and the band rotation enabling key (F6) pressed at the same time.



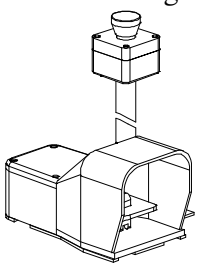
▶ Hold the control enabling key and the cycle start key (F7) pressed at the same time to start the band rotation and the head lowering at the set speeds. The RHLS point is automatically stored in this way.



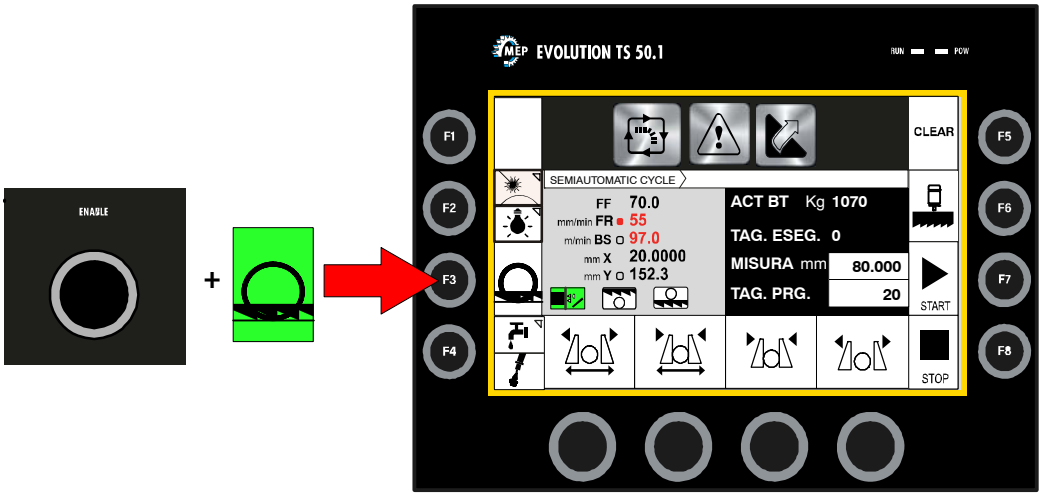
N.B. If the sawing machine is equipped with optional pedal control the cycle start control can be made from remote station. In this case it is necessary to enable the operation of the pedals, by selecting the appropriate entry in the list of options.



▶ Press the pedal control to start the working cycle.



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 band motor stops. If you intend to repeat the cycle or start a new job, press CLEAR (F5) to clear the cut pieces.

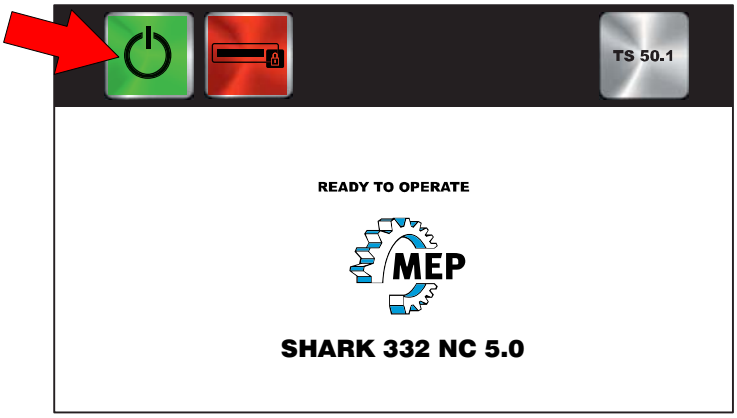
Automatic operating cycle with single cycle

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

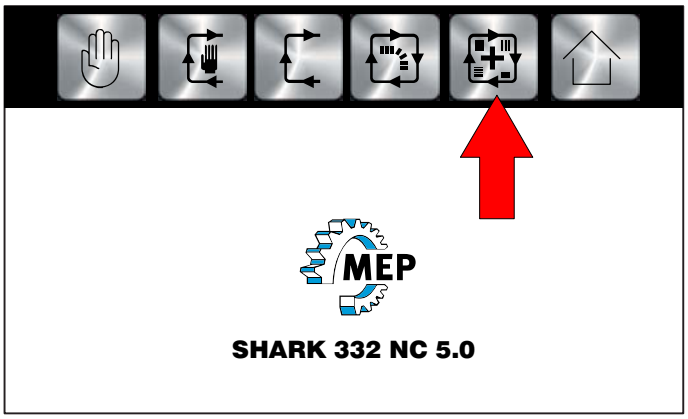
Sequence of the operations for an automatic cutting with single cycle:

▶ power up the machine by turning the main switch;

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



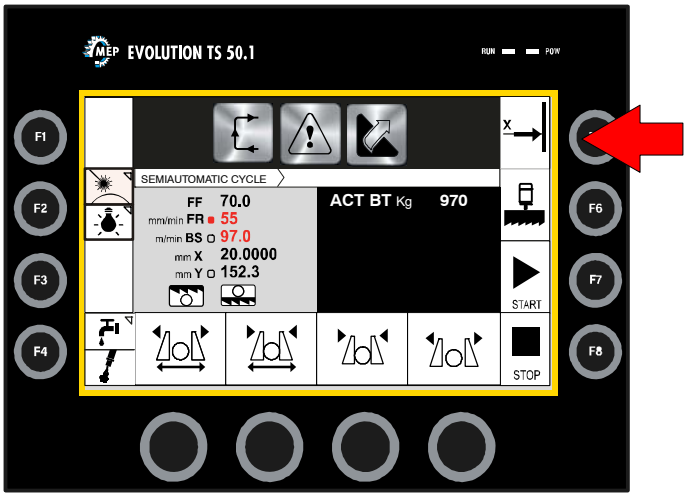
▶ select the single cycle – automatic working mode, pressing the box indicated in the figure on the touch screen.



▶ release the emergency mushroom button if pressed, then press the RESET button.

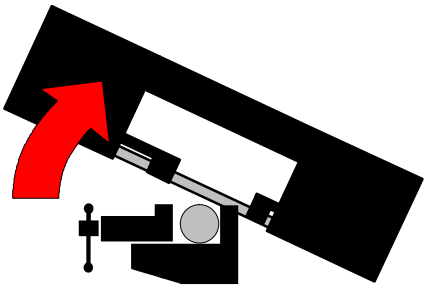


N.B. The sawing machine zeroes the feeder shuttle when the automatic cycles are started. If the feeder must be zeroed before the cycle start, select the semi–automatic working cycle and zero by pressing the control enabling key and the F5 key shown in the figure at the same time.



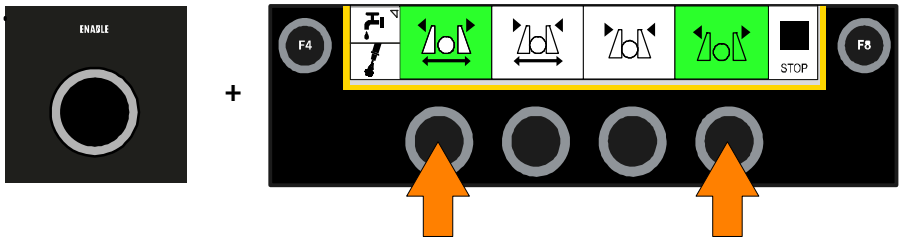
▶ Lift the cutting bow completely using the joystick (Y+), pressing the ENABLE button at the same time.



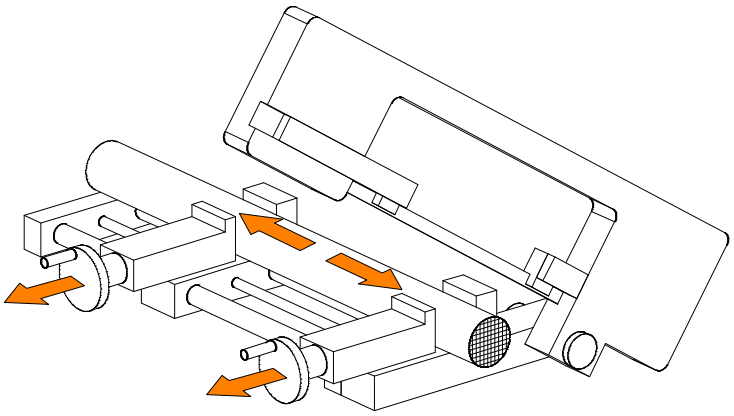


Warning The head lifting completely up is recommended to avoid the accidental contact between the material and the blade during the insertion inside the vices.

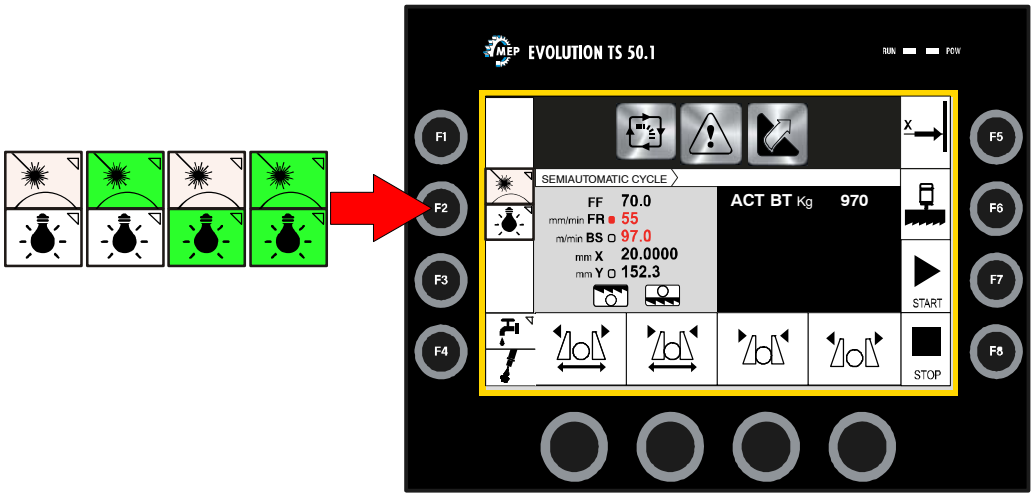
▶ Open the cutting and feeding vices holding the control enabling key and the relevant buttons on the keyboard pressed at the same time.



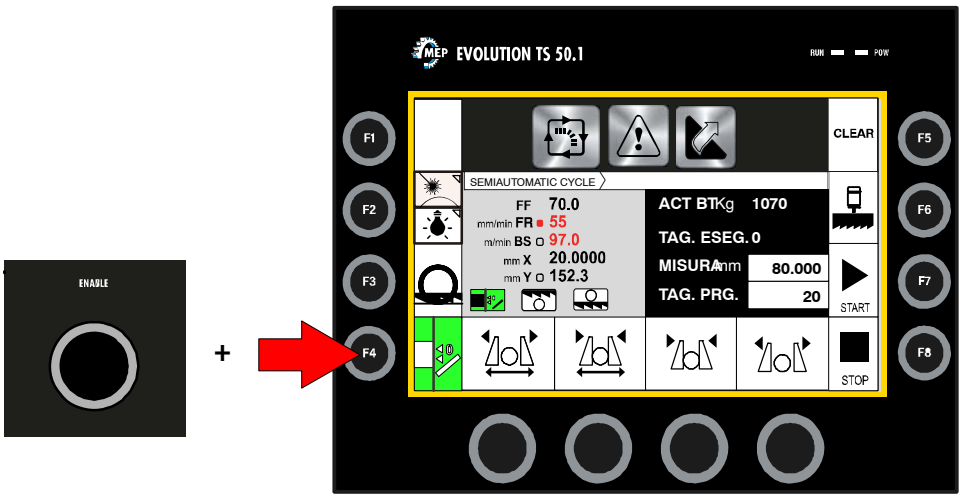
▶ Open the cutting and feeding vices using the flywheels, then insert the material being processed positioning it under the blade vertical, ready for the facing cut.



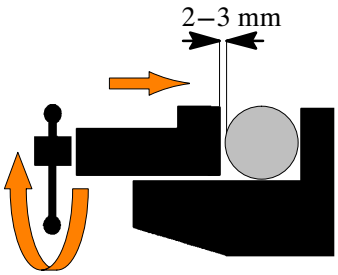
N.B. The machine can be equipped with the laser−lamp accessory to illuminate the working table and to make the material positioning under the blade vertical easier. Pressing the F2 key several times you can choose either or both.



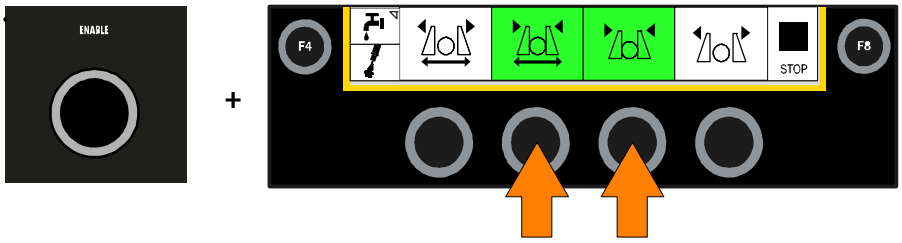
Warning In the standard automatic operation the sawing machine never counts the first cut, as it is considered as a bar facing scrap. To exclude this function, deactivate it pressing the ENABLE + F4 keys in sequence and at the same time. To re−activate it, use the same control.



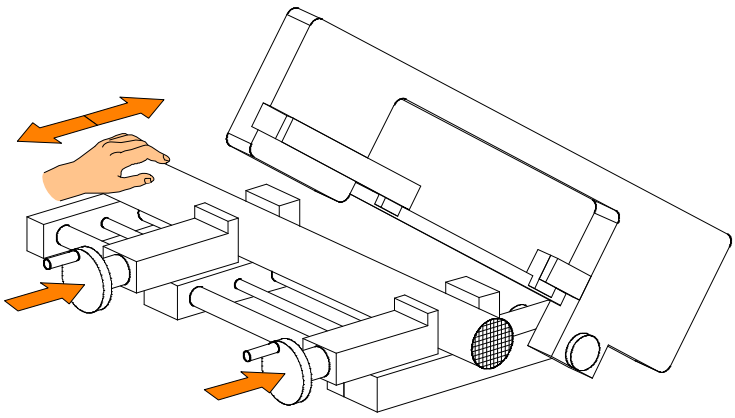
▶ Close the feeding and cutting vices rotating the flywheel clockwise, approaching the movable jaws at 2÷3 mm from the material to be cut.



▶ Close both vices by holding the control enable button and the vice closing buttons pressed in sequence and at the same time.

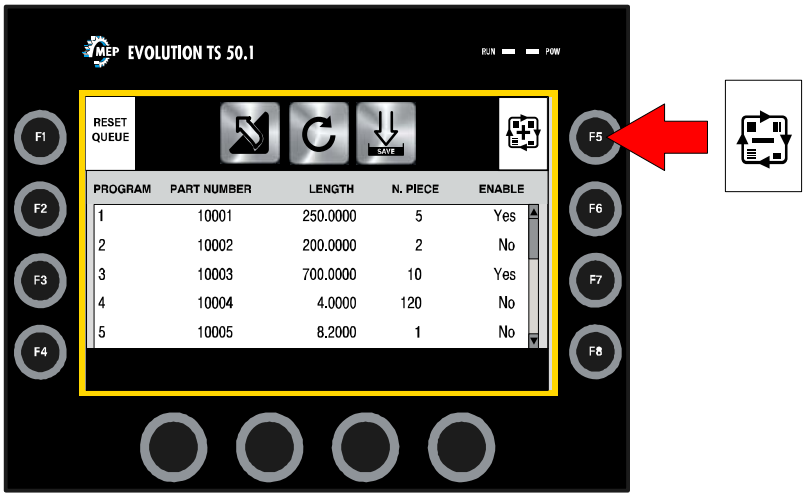


Attention Check that the workpiece is effectively locked in positon!

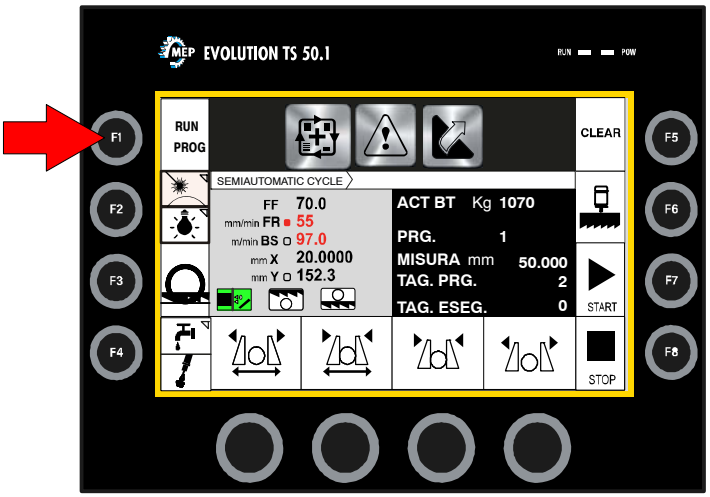


N.B. The piece can seem not locked as the vice is already in the closing position through the hydraulic piston. Thus, the operation must be repeated, namely: open the vice by the suitable push button, approach the movable jaws to the piece further and lock again by the closing push button, considering that the stroke of the hydraulic piston is about 6 mm

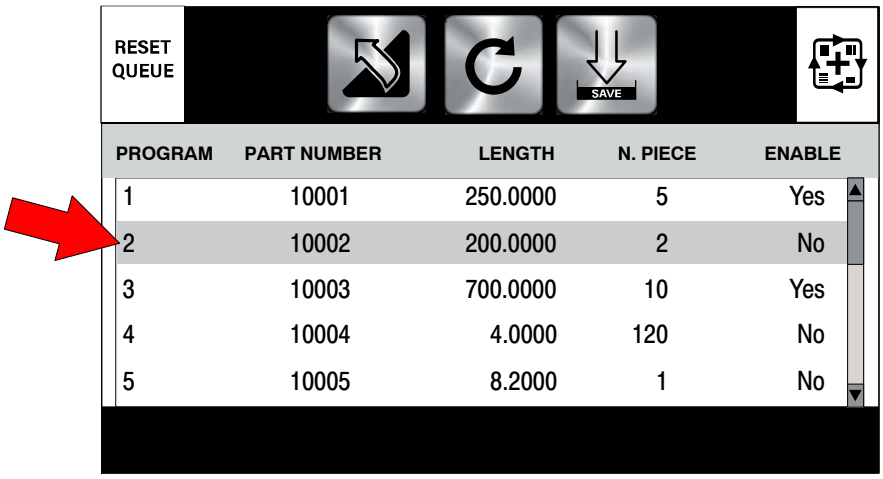
▶ Press the F5 key to select the Single Cycle – Automatic working mode (icon with "–")



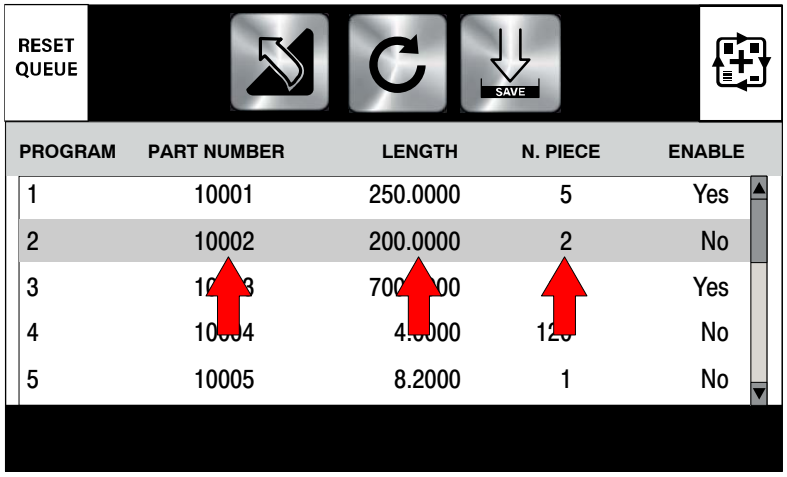
▶ Press the RUN/PROG key to access the programming page for the automatic operation with single cycle.



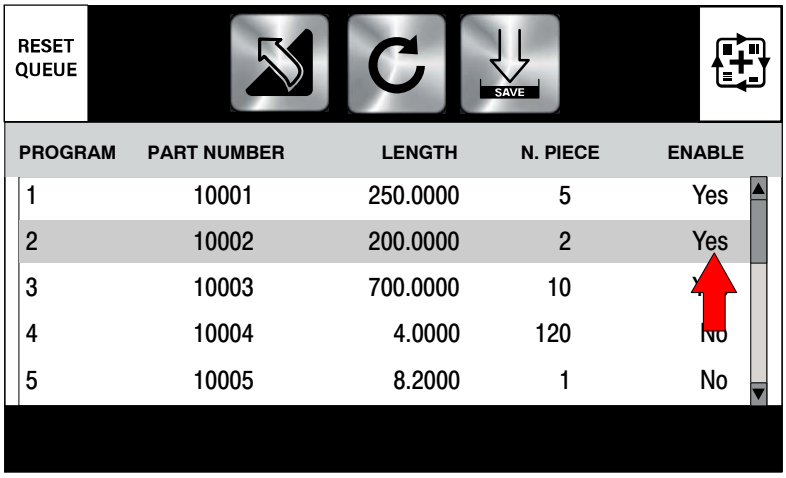
▶ The display shows the following screen listing all programs (max. 10). Press the program number to select the one to be set.



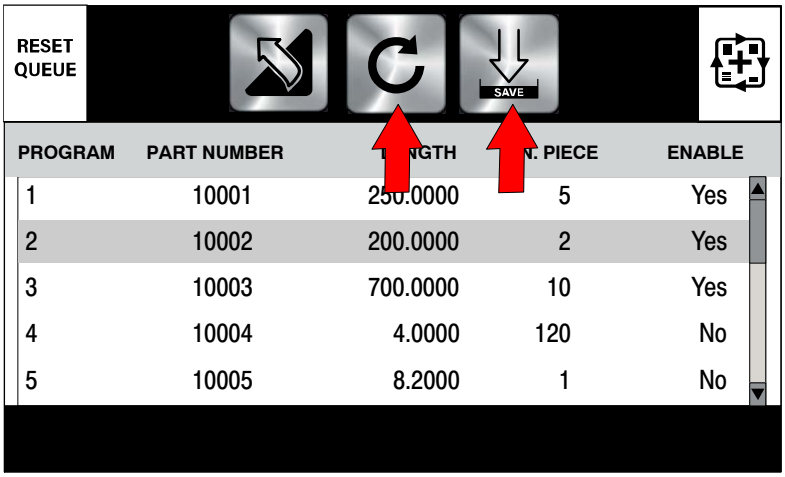
▶ Press to edit all values of “Part Number” (company identification code), “Length” (piece length), and “Nr. Piece” (number of pieces) using the key-pad.



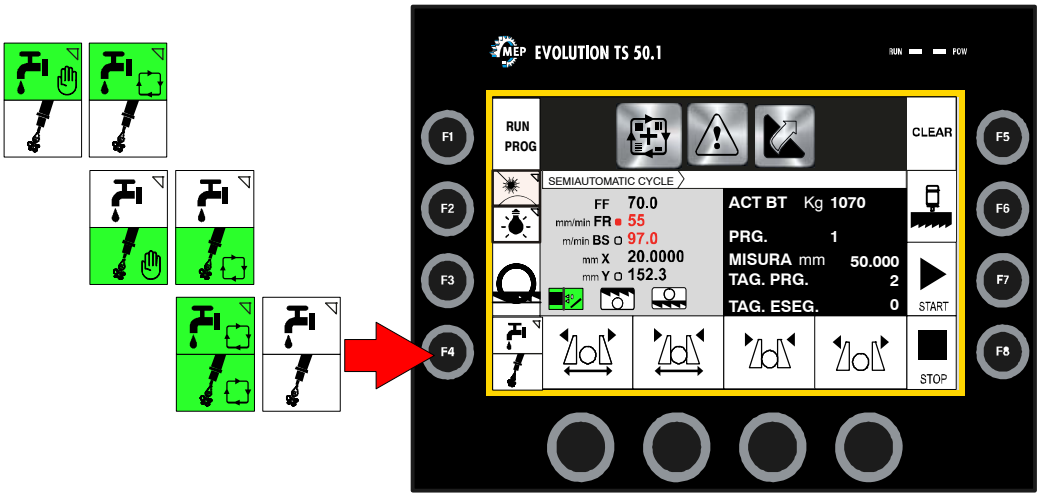
▶ In the end choose to activate or deactivate the selected by “Enable” (Yes / No).



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.

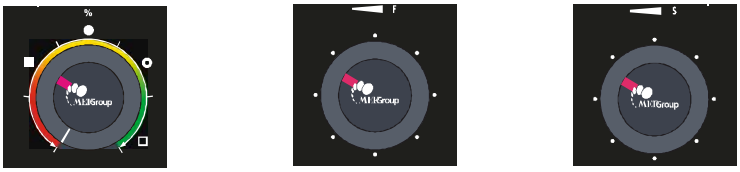


▶ Set the fluid jet by pressing the button shown in the figure. The box will light up to indicate that it is selected. Adjust the amount using the valves on the blade guide head. Press the button repeatedly to select the dispensing mode (automatic or manual).



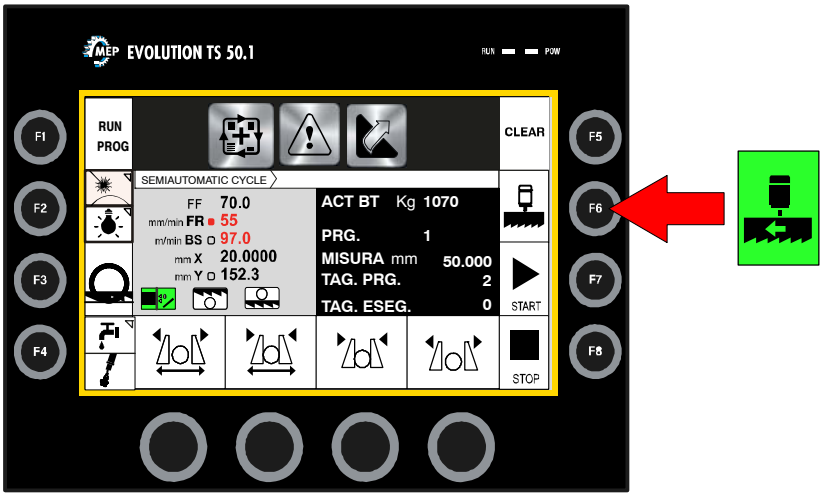
▶ Set the cutting parameters, previously shown, using the following adjusters.

Attention 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.

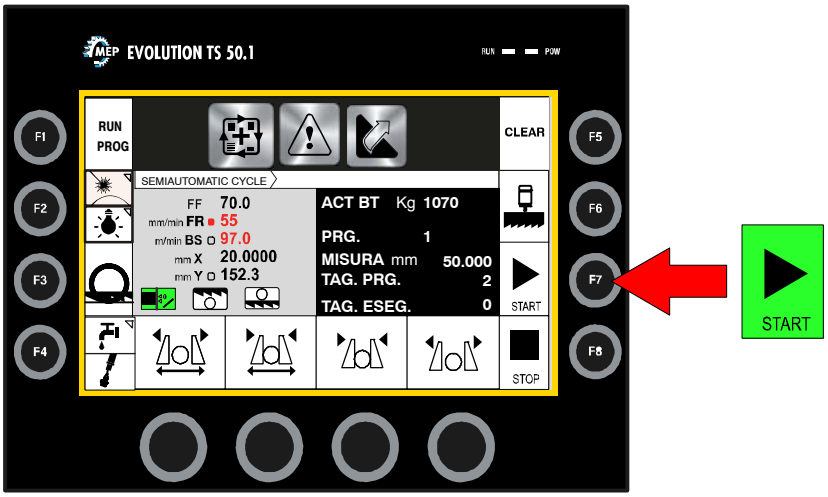


▶ Position the head at approximately 10 mm from the workpiece.

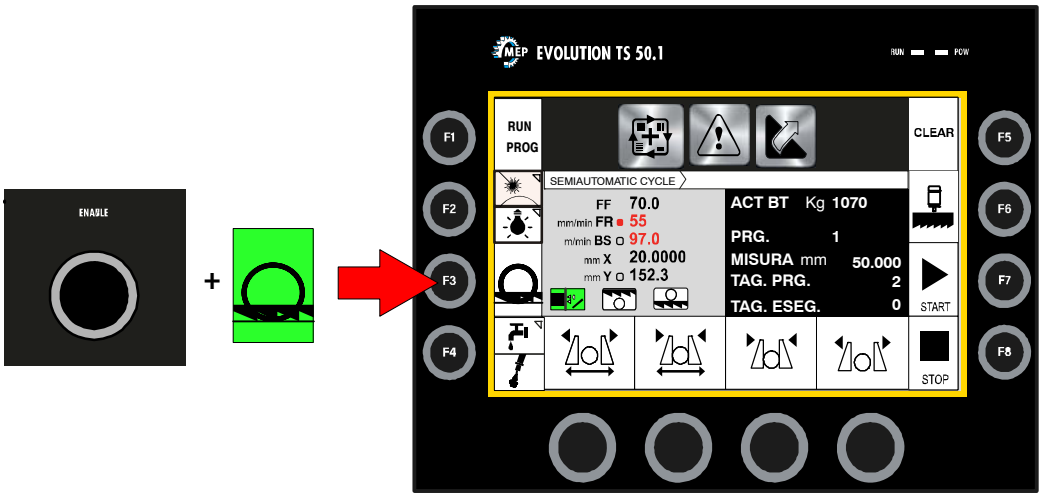
▶ Press the band rotation enabling key (F6).



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

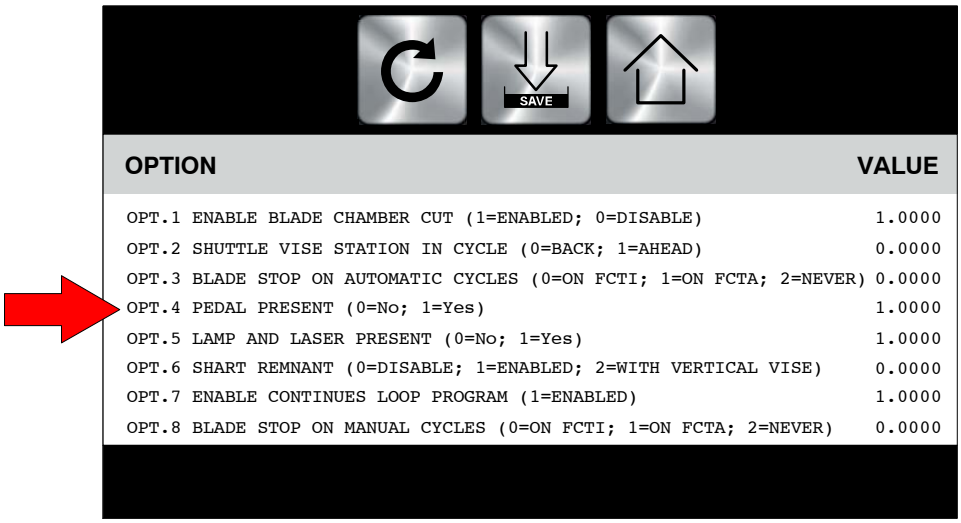


N.B. If the existing FHLS point is to be deleted now, follow the operations described above.



The sawing machine 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 band motor stops. To repeat the cycle or to start a new machining press CLEAR (F5) to set the cut pieces to zero.

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.



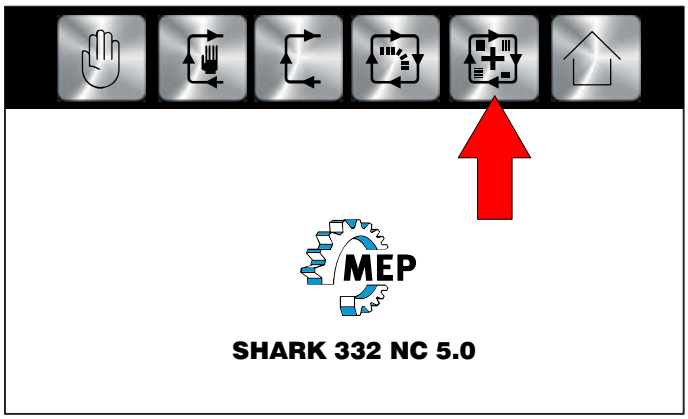
If the machining cycle must be stopped, press F8 Cycle Stop. To start it again, press an uold down the enabling command key and F7 Cycle Start key.

Automatic operating cycle with continuous cycle

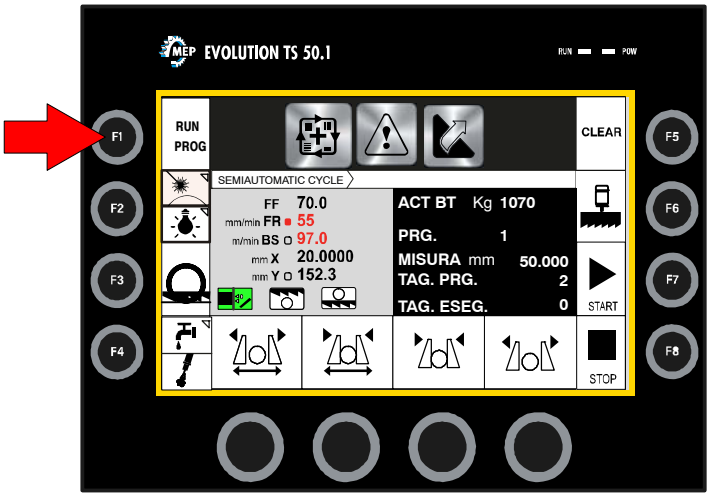
- Continuous cycle: it carries out the stored programs like in the single cycle but at the end of each program it AUTOMATICALLY goes to the next program.

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:

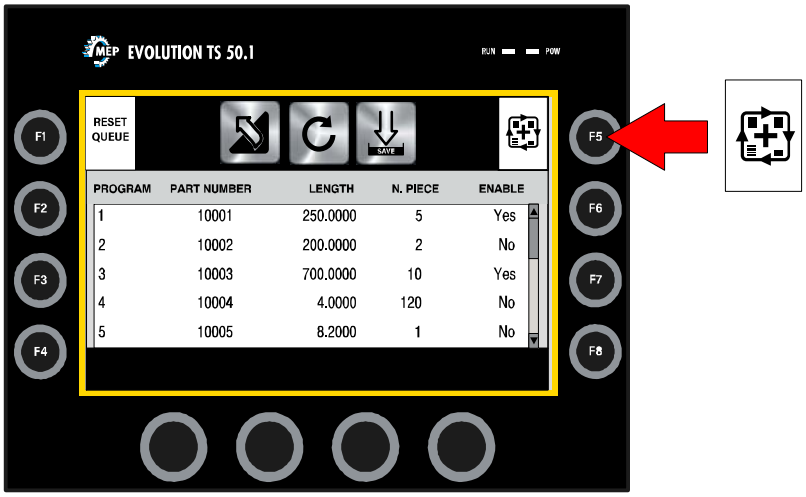
▶ After having initialized the machine, prepared the material to be machined and set the functional parameters, select the automatic machining mode with continuous cycle, pressing the box shown in the figure on the touch screen.



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

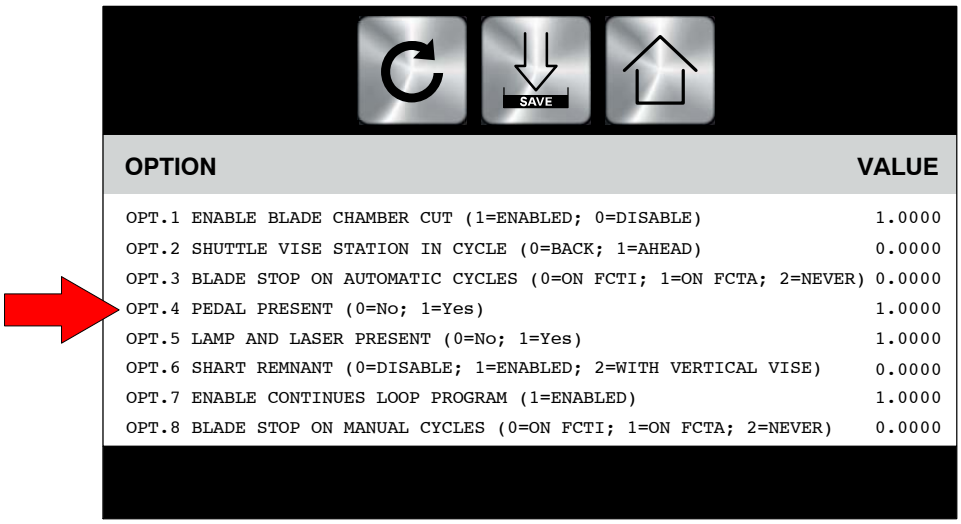


▶ Press the F5 key to select the Continuous Cycle – Automatic working mode (icon with “+”)



The sawing machine then feeds new material performing all the program cuts and continues automatically with the next ones according to the set sequence.

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.



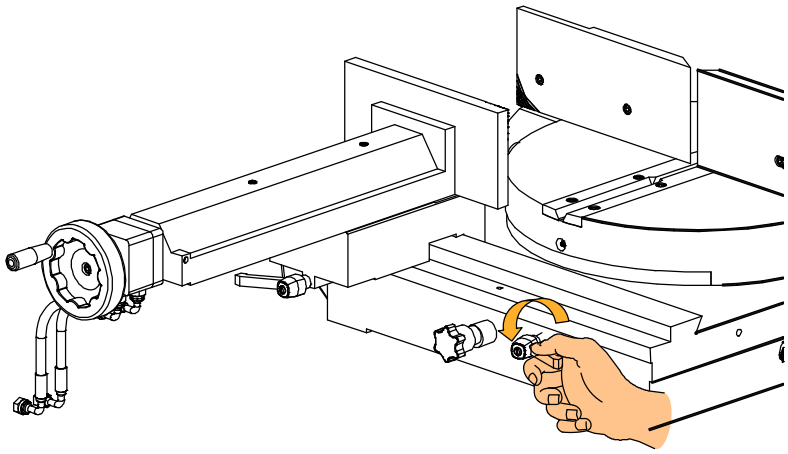
If the machining cycle must be stopped, press F8 Cycle Stop. To start it again, press an uold down the enabling command key and F7 Cycle Start key.

Angled cuts

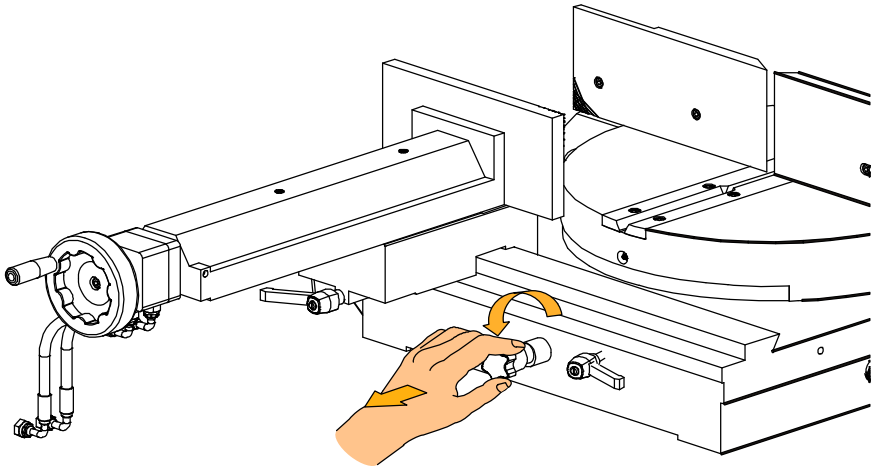
The machine can make angled cuts from 60° left to 45° right. Reference stops are mounted on the sides of the turntable to facilitate rapid 0°, 45° and 60° cuts to the left and 45° cuts to the right.

Angled cuts 45° to the left

- ▶ Make sure the vice is positioned to the left of the 0° cutting slot;
- ▶ slacken the turntable lock/release lever.

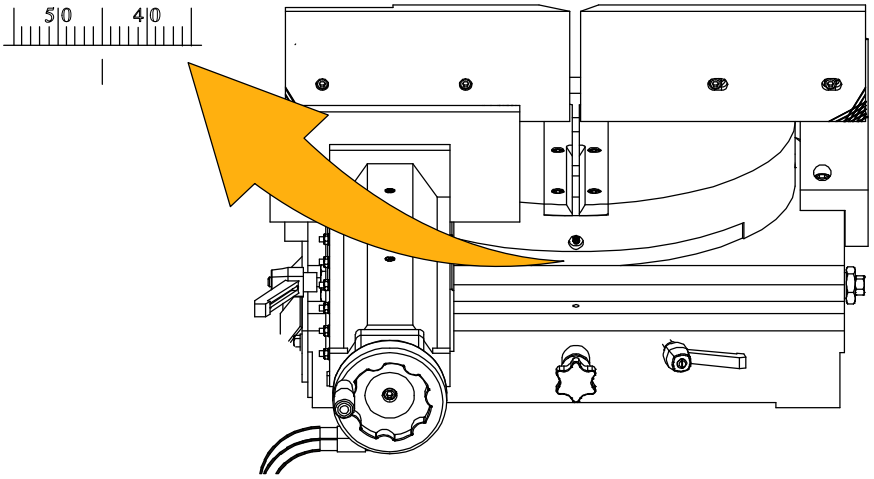


- ▶ Pull the eccentric pin knob towards you (0° reference stop) and rotate slightly to raise it.



Warning The 0, 45 and 60° reference stops for cuts to the left and the 45° reference stop for cuts to the right facilitate rapid head positioning during turntable rotation. However, the eccentric pin is only correctly positioned if the initial rotation of the turntable when released is corrected.

▶ Swing the head from left to right until it is positioned at the required angle, as indicated by the graduated scale on the turntable.



Attention Always rotate the head when it is in the upper position to avoid blade collision with the moving jaw on the clamp.

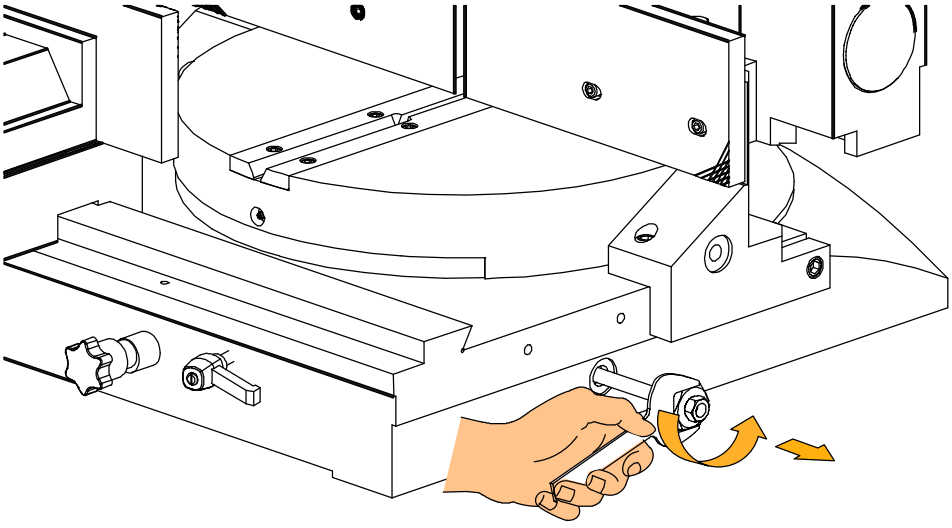
▶ Relock the turntable lock/release lever.

▶ Make the cut in the required operating mode, following the preliminary safety instructions set out in this chapter.

Angled cuts 60° to the left

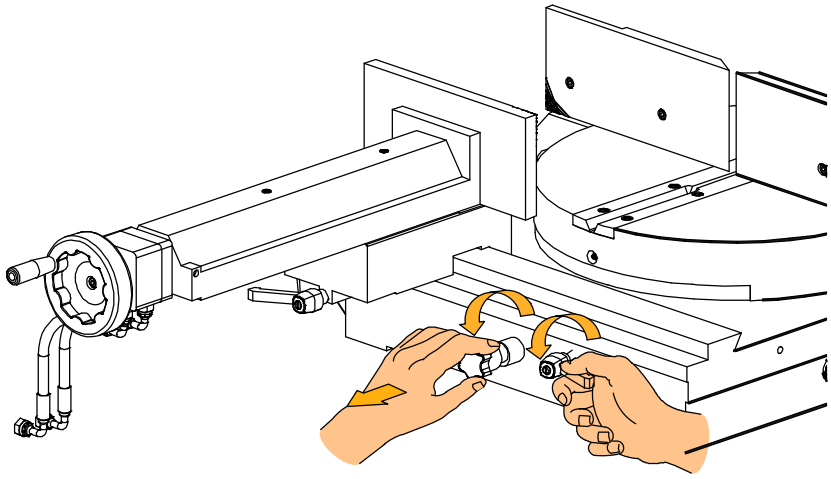
▶ Undo the bush on the 45° left reference stop, as illustrated in the figure below, using a 36 mm wrench.

▶ Remove the 45° reference stop.



▶ Slacken the turntable lock/release lever.

▶ Pull the eccentric pin knob towards you (0° reference stop) and rotate slightly to raise it.



▶ Swing the head from left to right until it is positioned at the required angle, as indicated by the graduated scale on the turntable.

▶ Relock the turntable lock/release lever.

▶ Before cutting, remove the lever from the front head support and replace it with the grub screw in the accessory pack.

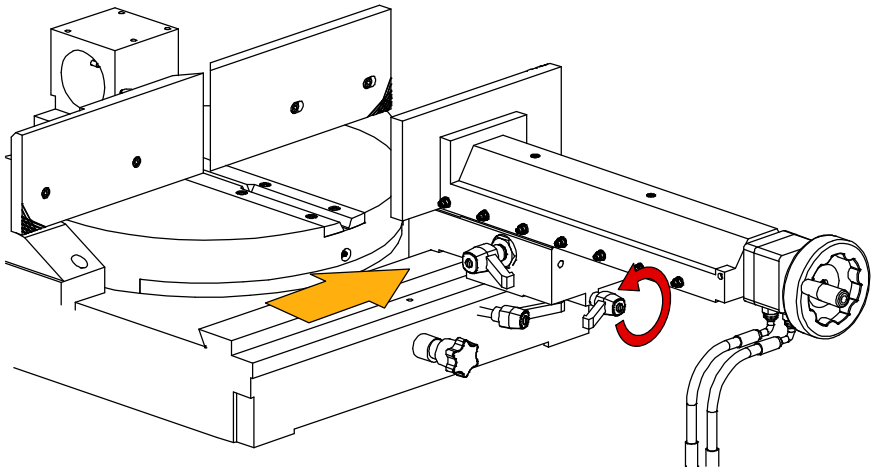
▶ Make the cut in the required operating mode, following the preliminary safety instructions set out in this chapter.

Angled cuts 45° to the right

▶ Make sure the vice is positioned to the right of the 0° cutting slot.

▶ slacken the locking lever as shown in the figure below;

▶ position the vice to the right and lock the lever.

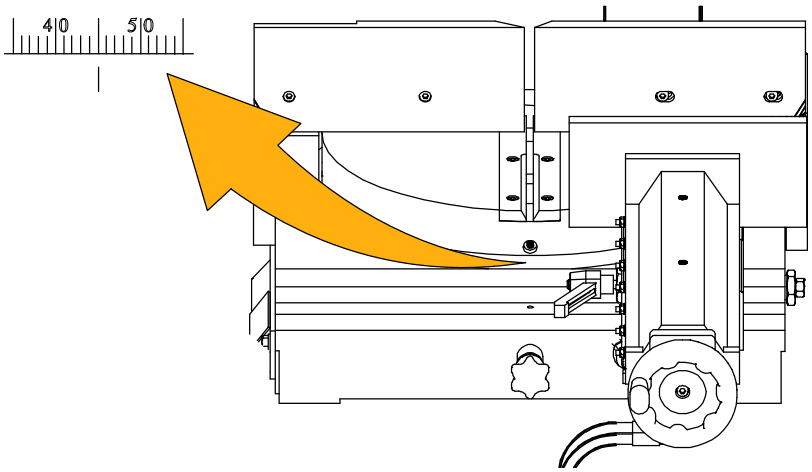


Attention When positioning the vice to the left or right, make sure the moving jaw is beyond the 0° cutting slot to avoid any risk of collision with the blade downstroke.

Following the same procedure described above for 45° cuts to the left, now position the head for 45° cuts to the right:

▶ slacken the turntable lock/release lever;

▶ pull the eccentric pin knob towards you (0° reference stop) and rotate slightly to raise it;

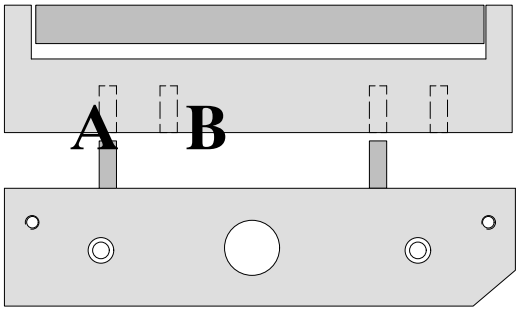


▶ swing the head from left to right until it is positioned at the required angle, as indicated by the graduated scale on the turntable;

▶ relock the turntable lock/release lever;

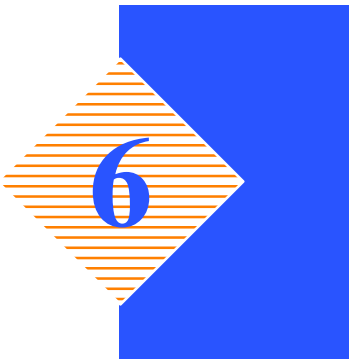
▶ make the cut in the required operating mode, following the preliminary safety instructions set out in this chapter.

Warning When cuts at 45 degrees to the right are made, the feeder support bar next to the fixed platform must be moved from position “A” to position “B”.



Attention Do not carry out cuts inclined to the right with automatic operation cycle, rather only with manual, semiautomatic and semiautomatic–dynamic operation cycles.

Diagrams, exploded views and replace–ment parts



This chapter contains functional diagrams and exploded views of the **SHARK 332–1 NC 5.0**. 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.

APSL3 drive for step motors

FOREWORD

This drive enables to control a stepper motor using a direction–step pulse train. By connecting the input ENABLE with +15 V dc/+24 V dc the drive will be enabled (current in the motor = 12 A) with following power supply to the stepper motor, after sending at least 1 step, disconnecting or connecting with 0 V the drive will be disabled and the motor will be stopped, without supplying any torque.
The acceleration/deceleration ramp, the current and the step division can be adjusted using the dip switches and the trimmers on the card (see tables).

CHARACTERISTICS

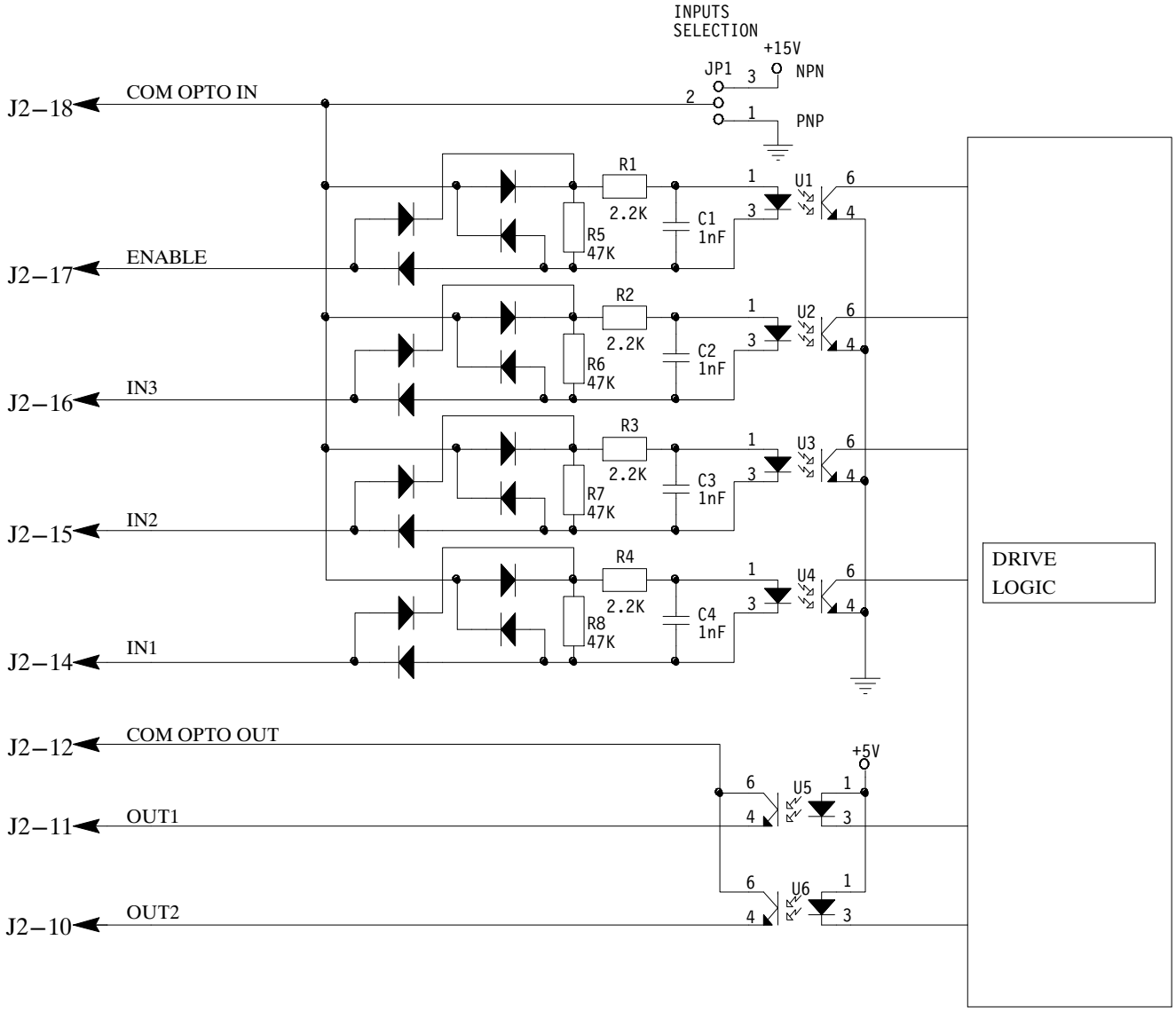
CUT	APSL3
VDC NOM. [V]	40–80
VDC MAX. [V]	90
VDC MIN. [V]	30
I MAX. [A]	12
I MIN. [A]	1
I LÉPÉS [A]	0.5
Operating temperature [°C]	0–55

MEANING OF THE PARAMETERS IN THE TABLE

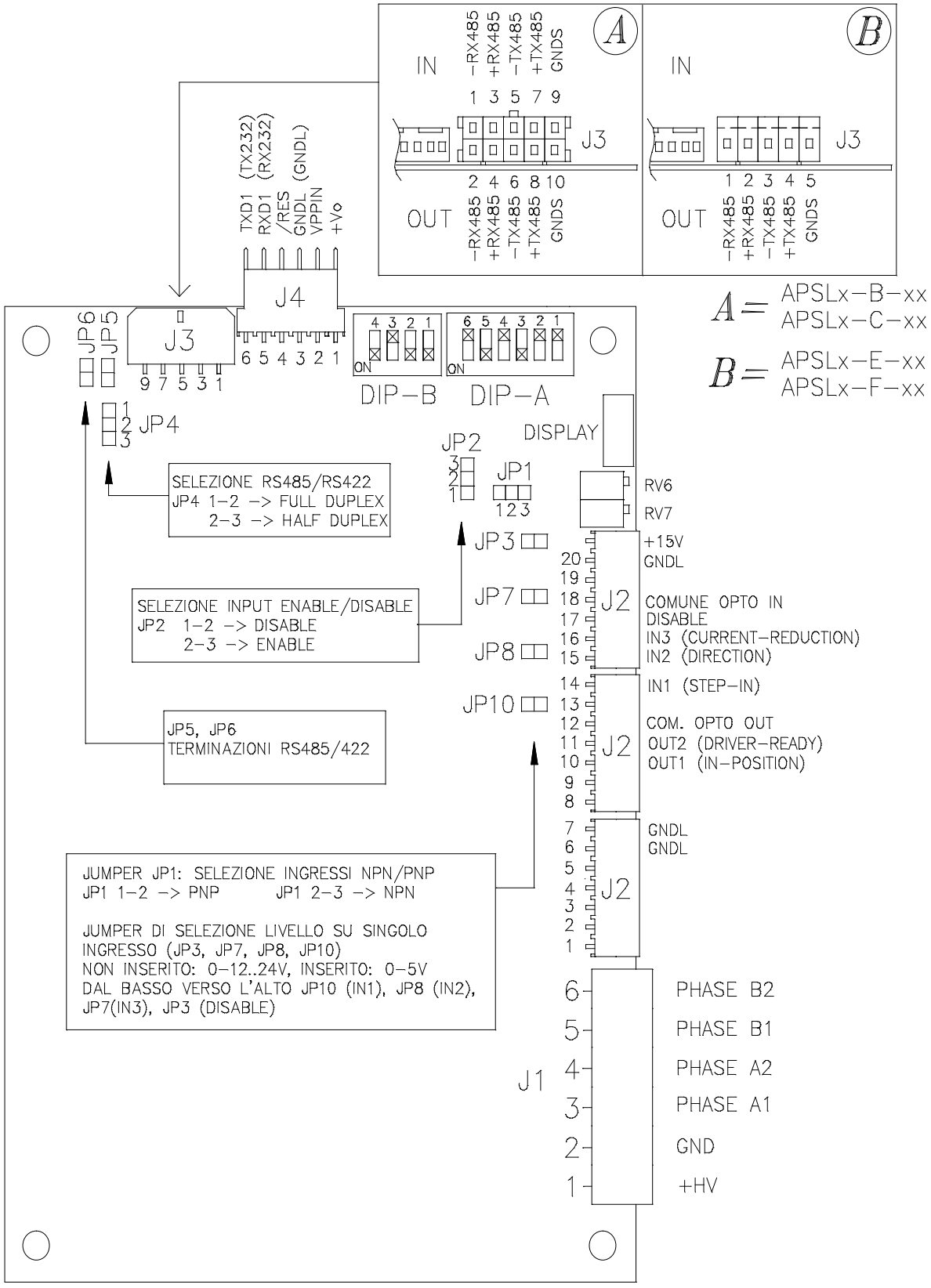
- **Vdc nom:** Nominal voltage at which the drive can be powered.
- **Vdc max:** Maximum voltage at which the drive can operate, where this limit is exceeded the protection intervenes, inhibiting the operation of the drive itself.
- **Vdc min:** Minimum voltage at which the drive can operate. When the 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.

TECHNICAL CHARACTERISTICS – APSL3 DRIVE	
Power supply	Terminal Name: + HV (Positive power supply) GND (0 V)
Engine connection	PHASE A1 = Phase A1 of the step motor PHASE A2 = Phase A2 of the step motor PHASE B1 = Phase B1 of the step motor PHASE B2 = Phase B2 of the step motor
Outputs	Of a PNP optoinsulated type “open collector” (10 mA max)
	Also optoinsulated, so an external power supply (+12V/+24V) must be connected to the terminal common to the optoinsulators (Pin 12 connector J2). Maximum current for each output (10 mA).
Inputs	Of a PNP type (from 12 Vdc to 24 Vdc)
	Not optoinsulated: jumper JP1 –inserted Pin 12 of connector J2 –connected to +15V auxiliary (pin 21 connector J2) (common input optoinsulators)
	Optoinsulated: jumper JP1–not inserted Pin 18 on connector J2 –connected to GND of outside power supply (common input optoinsulators)
Protections and safety devices	Protections against short circuits: – between outputs – between outputs and the positive power supply terminal If one of the conditions above occurs, the drive will disable the power bridge, and display the error conditions on the screen: “u” = wrong power supply voltage value “t” = thermal protector intervention “c” = max. current protector intervention. due to a short circuit across the phases, or excess current. If the drive is not disabled by a protective device, the display will indicate the letter “r” (ready).
	Thermal protection against overheating
	Mains undervoltage and overvoltage safety devices

SCHEMATIC CONFIGURATION OF INPUTS / OUTPUTS



LAYOUT OF APSL3 DRIVE COMPONENTS



LISTA FOGLI \ INDEX

Foglio Sheet	Descrizione Description	Revisione \ Revision 0	1	2	3	4	5	6	7	8	9
1	INDICE CONTENUTI										
	Content Index										
2	INDICE CONTENUTI										
	Content Index										
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	Symbol Key										
4	LEGENDA SIMBOLI										
	Symbol Key										
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	Power Supply										
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	Motor Power Supply 400V										
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	Transformer Power Supply										
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	Auxiliary Circuit Power Supply										
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	Emergency safety relay										
12	RELE SICUREZZA RIPARI										
	Machine Guard Safety Relay										
13	AUSILIARI INVERTER										
	Inverter Auxiliary Circuits										

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	Stepper Motor Auxiliary Circuits										
15	UNITA' CENTRALE MEP50										
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16	INGRESSI DIGITALI MEP50										
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	Digital Output MEP50										
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21	INGRESSI ANALOGICI MEP50										
	Analog Input MEP50										
22	USCITE STEPPER MEP50										
	Stepper Output MEP50										
23	USCITA ANALOGICA E SERIALE MEP50										
	Analog Output and Serial MEP50										
24	ALIMENTAZIONE E ENCODER PANNELLO										
	Power Supplay and Panel Encoder										
25	OPTIONAL										
	Optional										
26	MORSETTIERA QUADRO										
	Panel Terminal Board										

Note :

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Dis. N. SHNC5.0/40050CE/1419
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Denominazione/Title: INDICE CONTENUTI / Content Index
Ordine/Requisition:
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Esecutore/Executor: MEP S.p.A.

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	Board Inside			CENTRAL OIL UNIT (HEAD)	
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32	RIASSUNTIVO CAVI		106	DISTINTA COMPONENTI	
	Cable Summary			MATERIAL LIST	
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	Cable Summary			MATERIAL LIST	
34	RIASSUNTIVO CAVI		108	DISTINTA COMPONENTI	
	Cable Summary			MATERIAL LIST	
35	DISTINTA MATERIALI		109	DISTINTA COMPONENTI	
	Material List			MATERIAL LIST	
36	DISTINTA MATERIALI				
	Material List				
37	DISTINTA MATERIALI				
	Material List				
38	DISTINTA MATERIALI				
	Material List				
100	LEGENDA SIMBOLI				
	SYMBOL KEY				

Note :

REV.	MODIFICA	DATA	FIRME
R0.0.	First Draft	01/04/2019	MEP S.p.A.

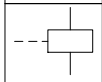
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Sim.\Sym.	File	Descrizione\Description
	H5	Lampada *Lamp*
	H11	LED *Led*
	M2	Motore asincrono trifase *Three–phase inductor motor*
	M9	Motore corrente alternata monofase *Single–phase inductor motor*
	Q1360	Int. automatico magnetotermico sezionatore tripolare *Three–phase automatic switch*
	R1	Resistore *Resistor*
	R6	Potenziometro *Potentiometer*
	R60	Potenziometro *Potentiometer*
	S2	Comando a Pulsante NO *Push button NO*
	S4C	Pulsante di emergenza NC *Emergency push button NC*
	S5	Comando rotativo a due posizioni NO *Rotary selector two position*

Sim.\Sym.	File	Descrizione\Description
	S7	Comando a pedale NO *Control pedal NO*
	S13C	Fine corsa comandato a camma libero NC *Limit switch free NC*
	S14C	Fine corsa comandato a camma azionato NC *Limit switch actuated NC*
	S15C	Comandato dal livello di un fluido (livellostato) NC *Water gauge NC*
	T2	Trasformatore per ausiliari con schermo *Trasformer for auxiliary white shield*
	Y1	Elettrovalvola (A) *Solenoid valve (A)*
	Y1A	Elettrovalvola (B) *Solenoid valve (B)*
	KA1	Bobina rele' Aux *Auxiliary relay coil*
	KM1	Bobina contattore *Contactor coil*
	BLK11	Trasformatore per ausiliari con schermo *Trasformer for auxiliary white shield*
	BLK12	Inverter (potenza) *Inverter (power)*

Sim.\Sym.	File	Descrizione\Description
	BLK13	Azionamento (potenza) *Drive (power)*
	BLK14	Inverter (ausiliari) *Inverter (auxiliary)*
	BLK15	Azionamento (ausiliari) *Drive (auxiliary)*
	BLK21	Motore passo-passo *Stepper motor*
	BLK41	Raccordo SX *Connector SX*
	BLK42	Raccordo DX *Connector DX*
	BLK43	Tubo corrugato *Corrugated pipe*
	BLK44	Riduzione PG *PG adapter*
	BLK51	Dado PG *PG nut*
	BLK56	Terminale a puntale *Terminal*
	BLK57	Filo unipolare *Wire*

				Dis. N SHNC5.0/40050CE/1419	Impianto/Plant *SHARK 281–332NC5.0 – CEI PLe*	Ordine/Requisition		Foglio/Page 3
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				File SHNC5.0CEI\1.dwg	Denominazione/Title LEGENDA SIMBOLI	Esecutore/Executor MEP S.p.A.		Ultimo/Last 216
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Translation of the original instructions

Sim.\Sym.	File	Descrizione\Description
	BLK58	Fascette plastiche di fissaggio *Plastic clamp*
	BLK60	Terminale a occhiello *Terminal*
	BLK66	Sacchetto portafusibile *Bag fuse*
	SPX08E	Dispositivo di prossimita' induttivo D.C. NO *Sensor of proximity fed DC NO*

Sim.\Sym.	File	Descrizione\Description

Sim.\Sym.	File	Descrizione\Description

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Data 01-04-2019

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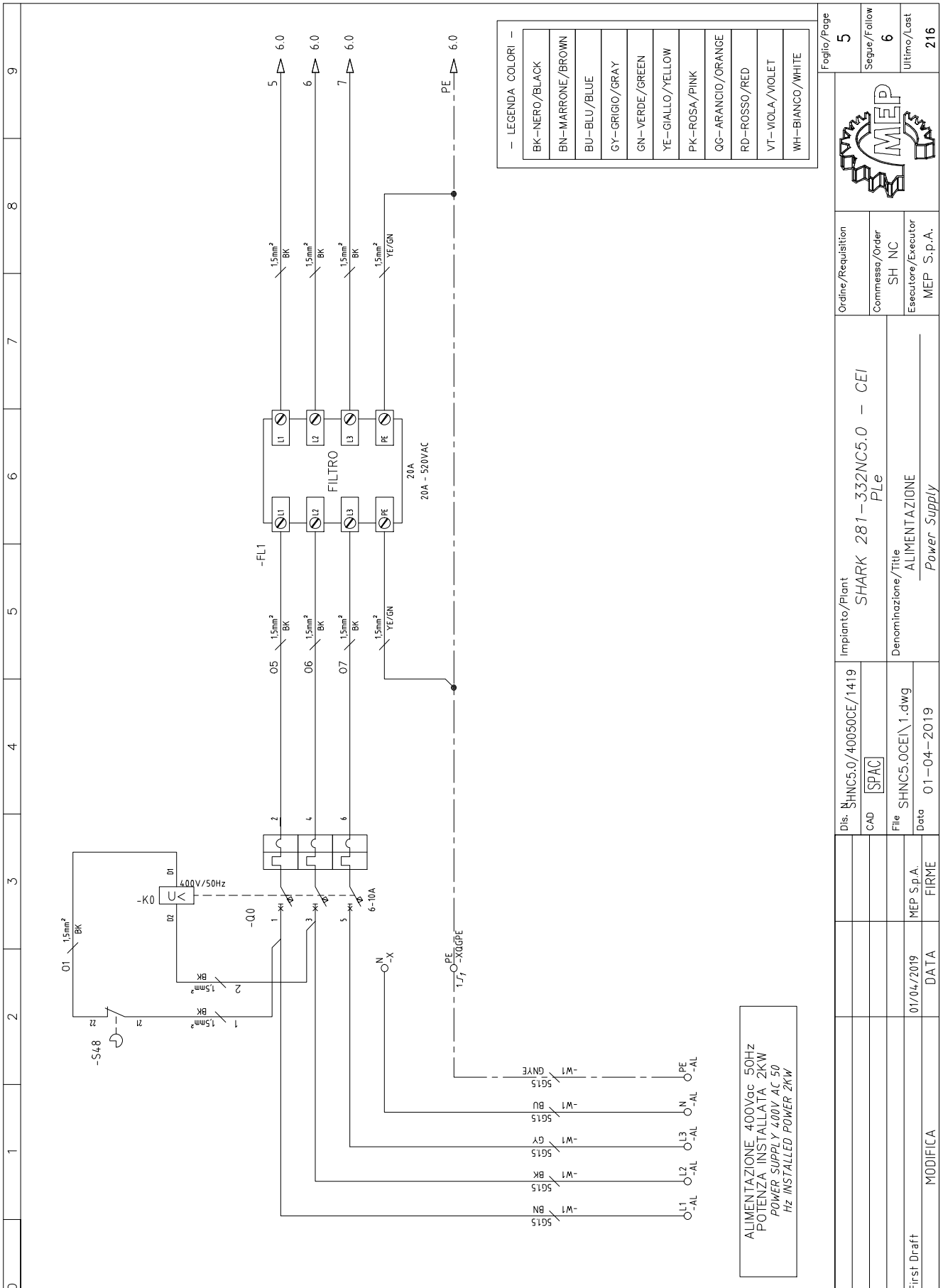
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Symbol Key

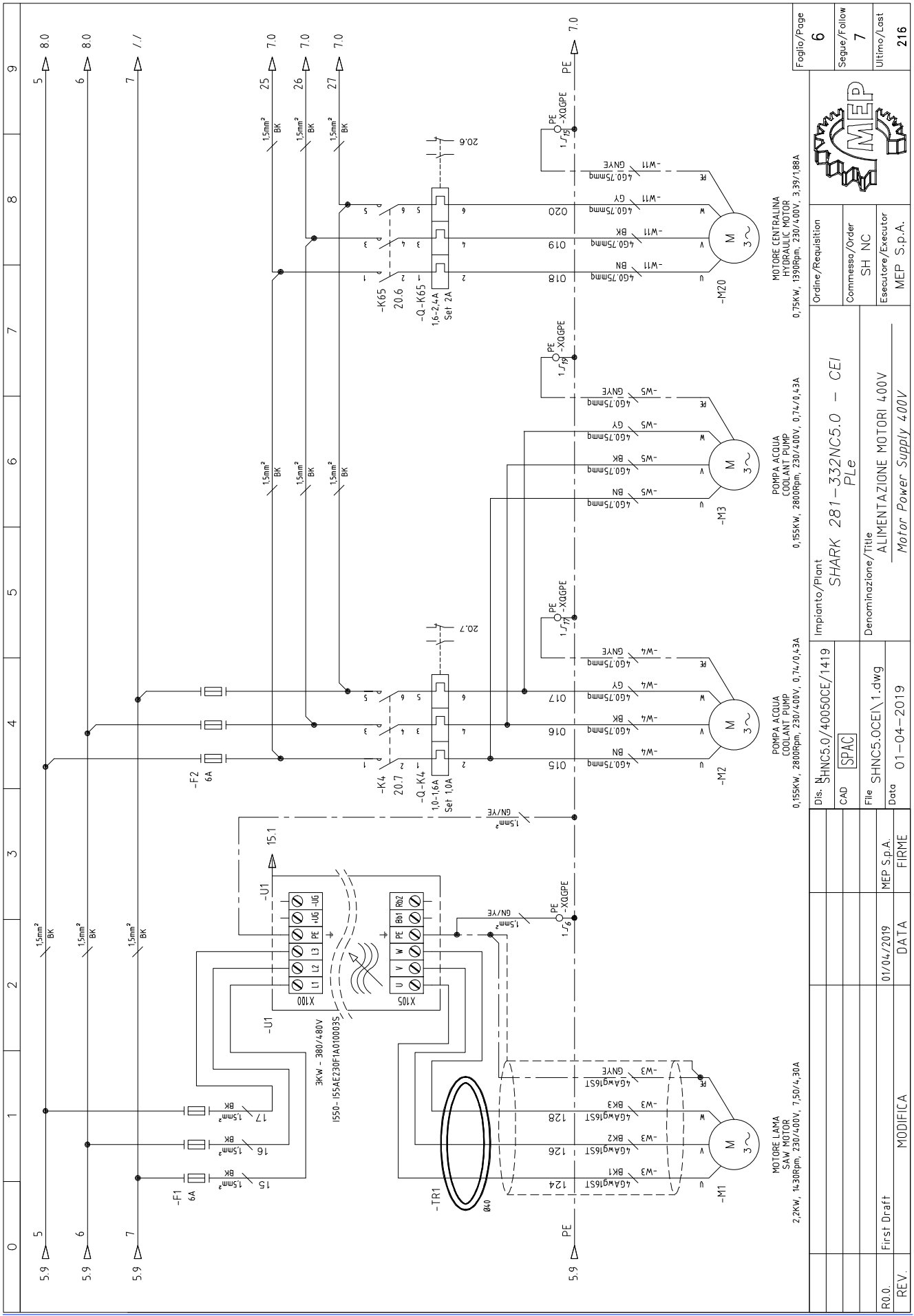
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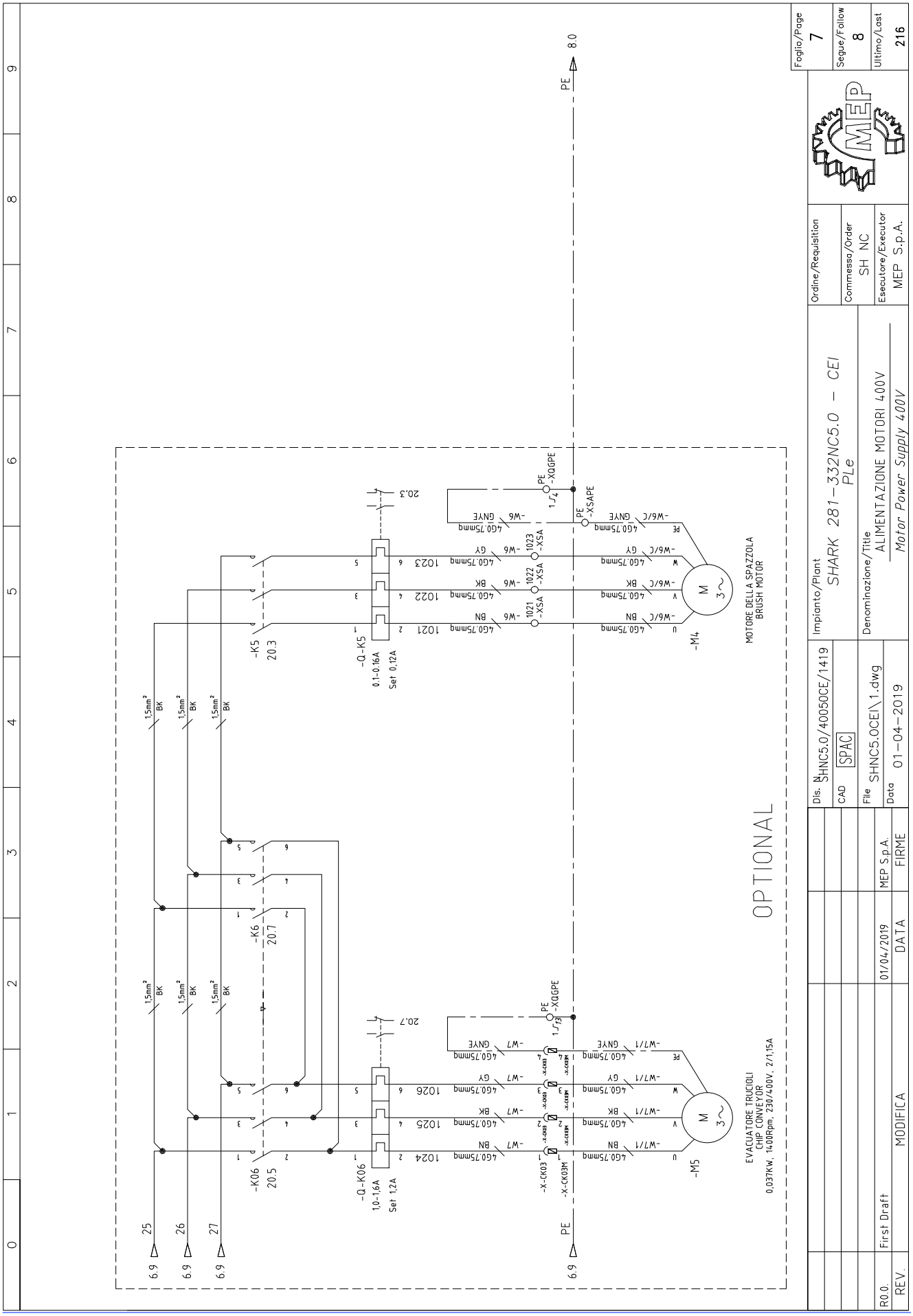
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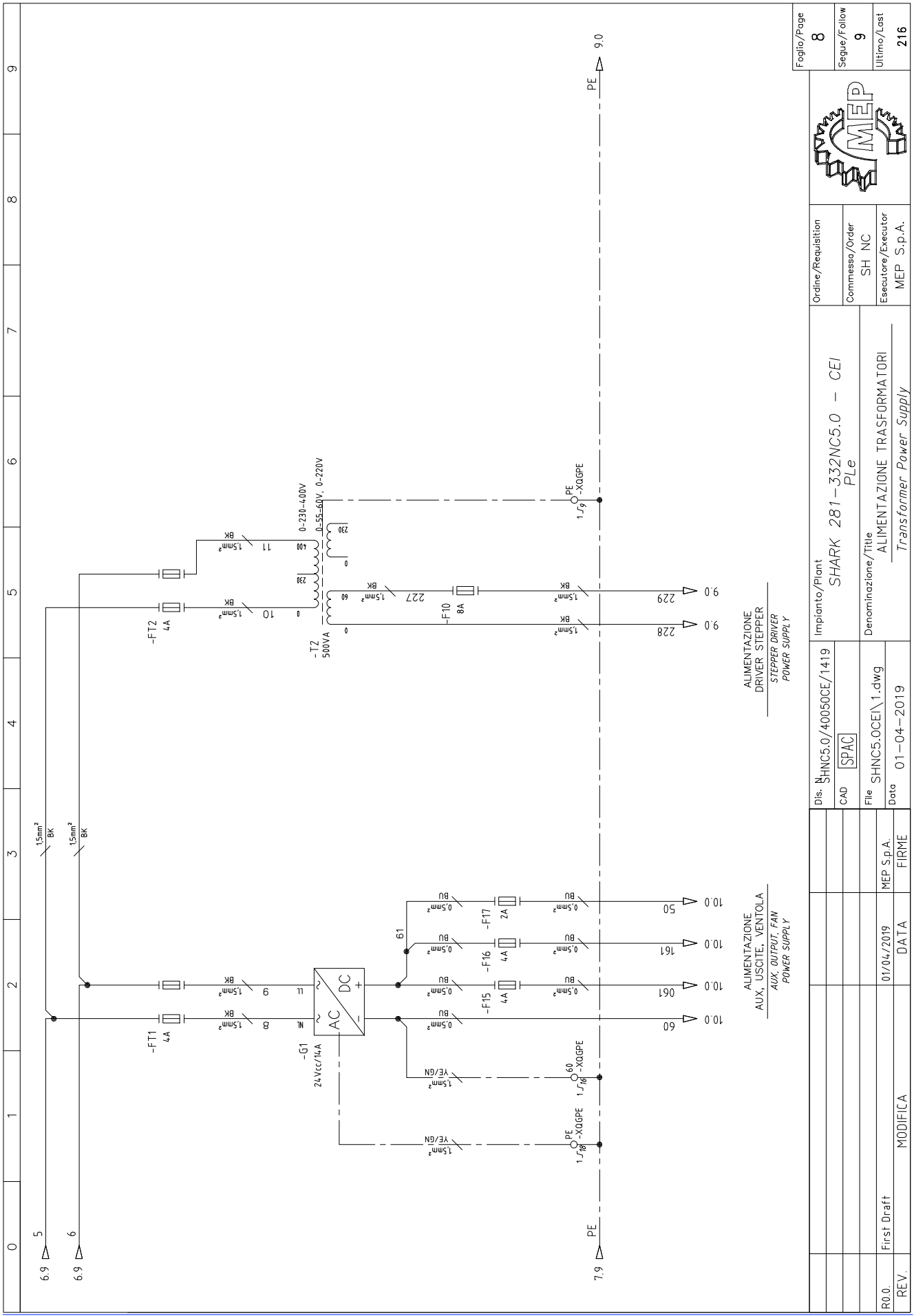
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MEP S.p.A.

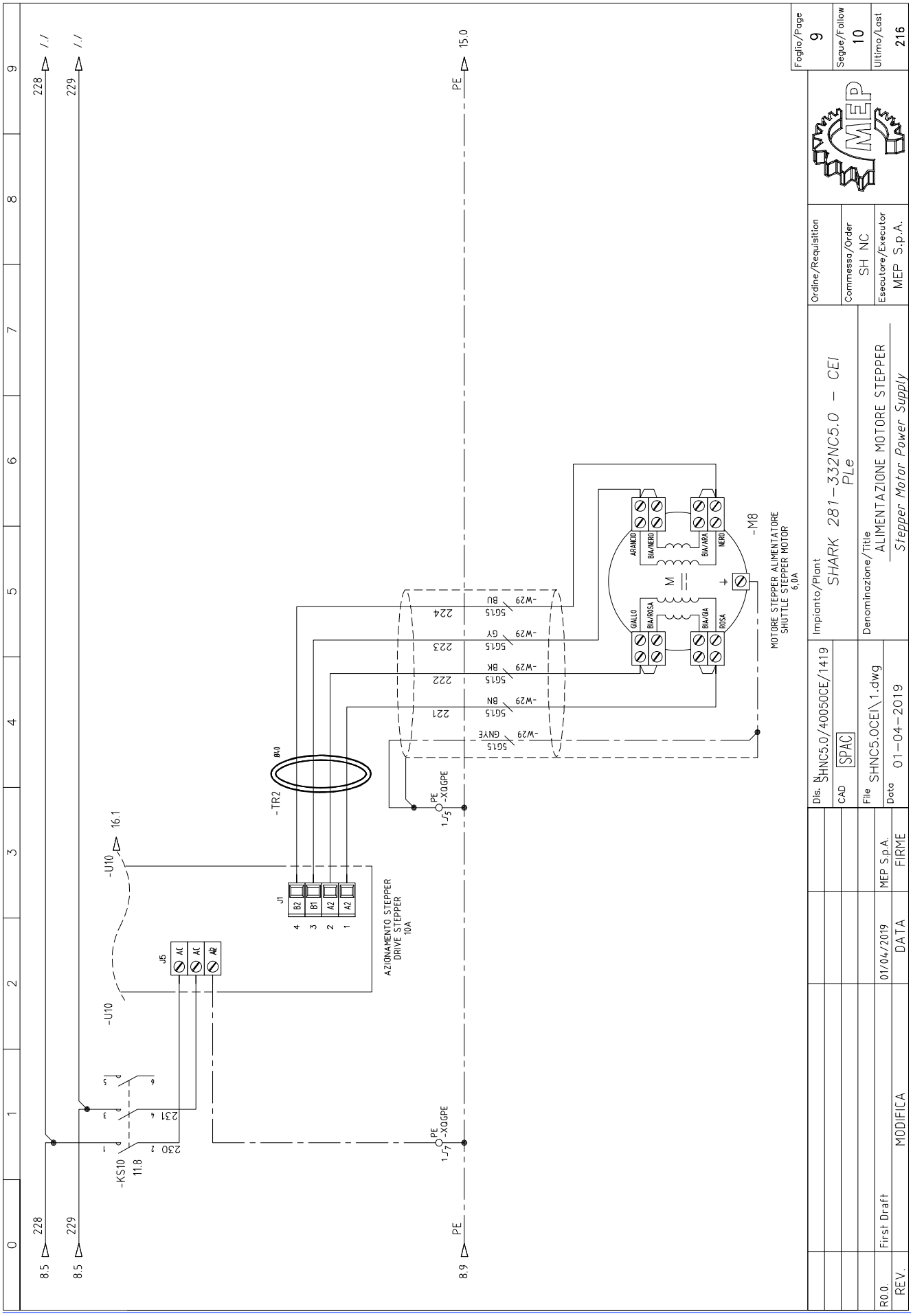
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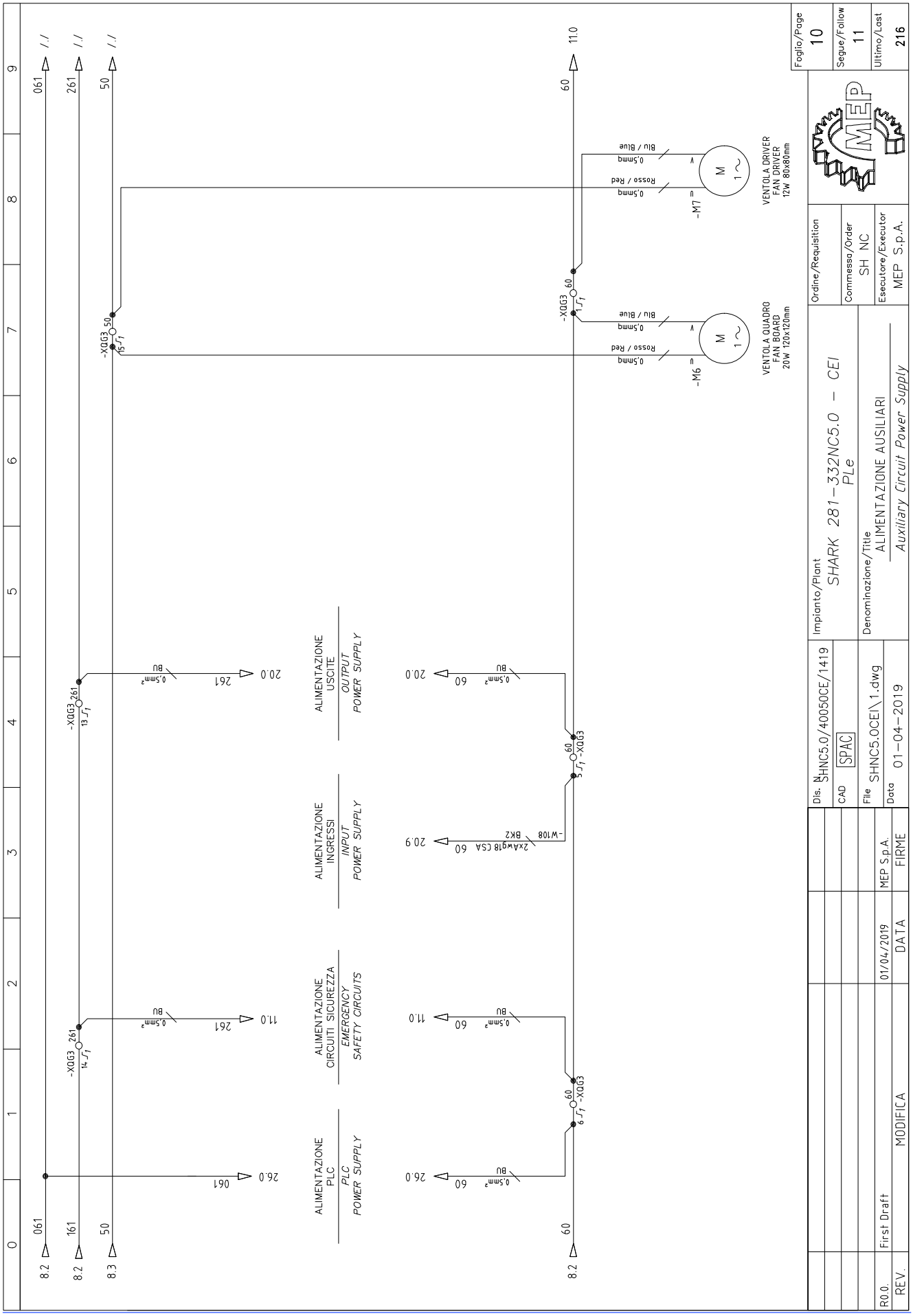

– LEGENDA COLORI –
BK–NERO/BLACK
BN–MARRONE/BROWN
BU–BLU/BLUE
GY–GRIGIO/GRAY
GN–VERDE/GREEN
YE–GIALLO/YELLOW
PK–ROSA/PINK
OG–ARANCIO/ORANGE
RD–ROSSO/RED
VT–VIOLA/VIOLET
WH–BIANCO/WHITE
-FL1
FILTRO
20A
20A - 520VAC
-K0
400V/50Hz
-Q0
-S48
6-10A
ALIMENTAZIONE 400VAC 50Hz
POTENZA INSTALLATA 2KW
POWER SUPPLY 400V AC 50
Hz INSTALLED POWER 2KW
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Esecutore/Executor MEP S.p.A.
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Denominazione/Title ALIMENTAZIONE
Power Supply
Dis. SHNC5.0/400SOCE/1419
CAD SPAC
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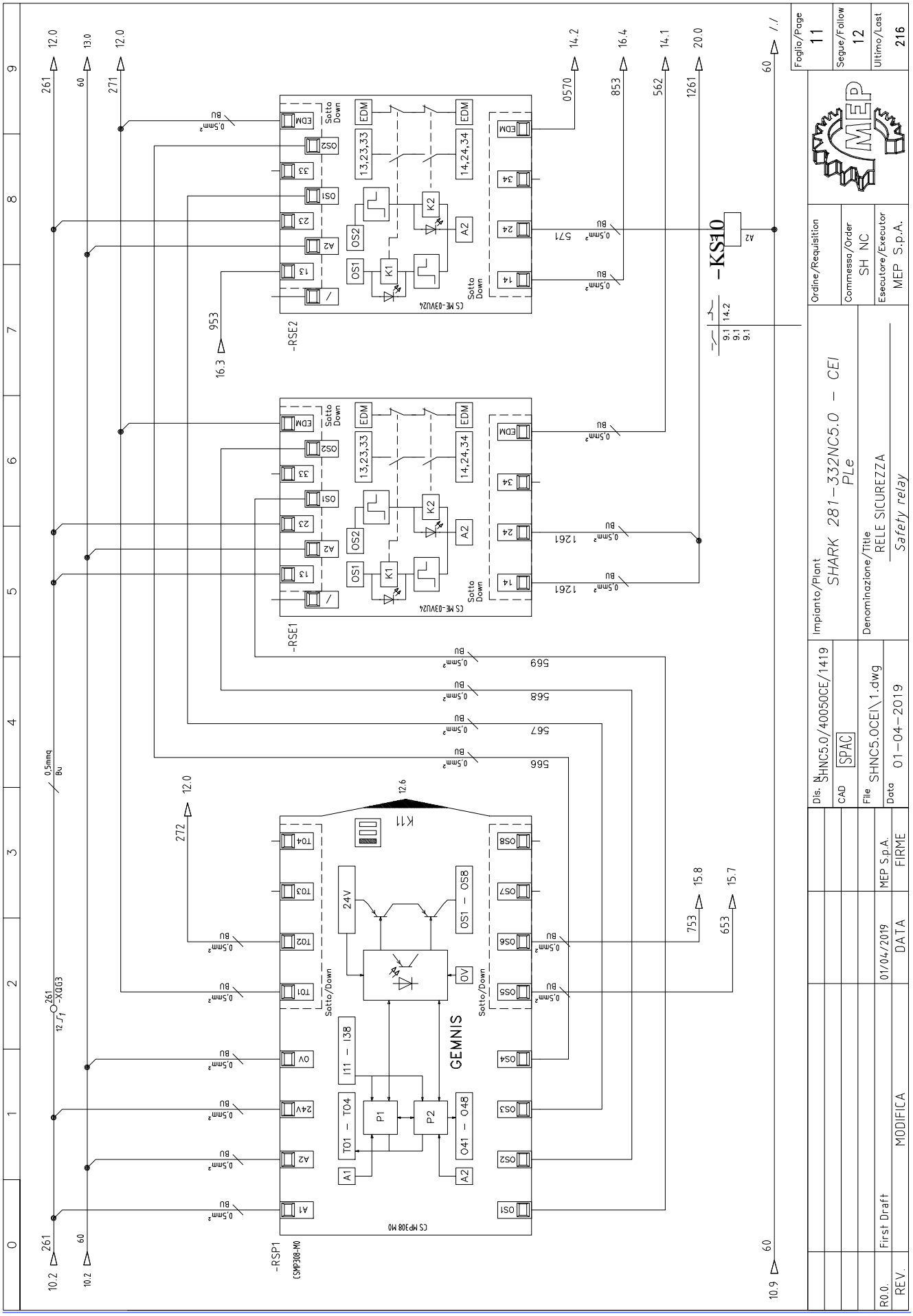

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Denominazione/Title ALIMENTAZIONE MOTORI 400V
Motor Power Supply 400V
Dis. SHNC5.0/400500E/1419
CAD SPAC
File SHNC5.0CEI\1.dwg
Data 01-04-2019
Ordine/Requisition
Commessa/Order SH NC
Esecutore/Executor MEP S.p.A.
MOTORE LAMA SAW MOTOR 2,2KW, 1430Rpm, 230/400V, 7,50/4,30A
MOTORE CENTRALINA HYDRAULIC MOTOR 0,75KW, 1390Rpm, 230/400V, 3,39/1,88A
POMPA ACQUA COOLANT PUMP 0,155KW, 2800Rpm, 230/400V, 0,74/0,43A
-M1
-M2
-M3
-M20
-TR1
-F1 6A
-F2 6A
-K4
-K65
-Q.-K4 1,0-1,6A Set 1,0A
-Q.-K65 1,6-2,4A Set 2A
-U1
3KW - 380/480V
I550-I55AE230F1A0100035
X100
X105
REV. R0.0
First Draft
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01/04/2019
DATA
MEP S.p.A.
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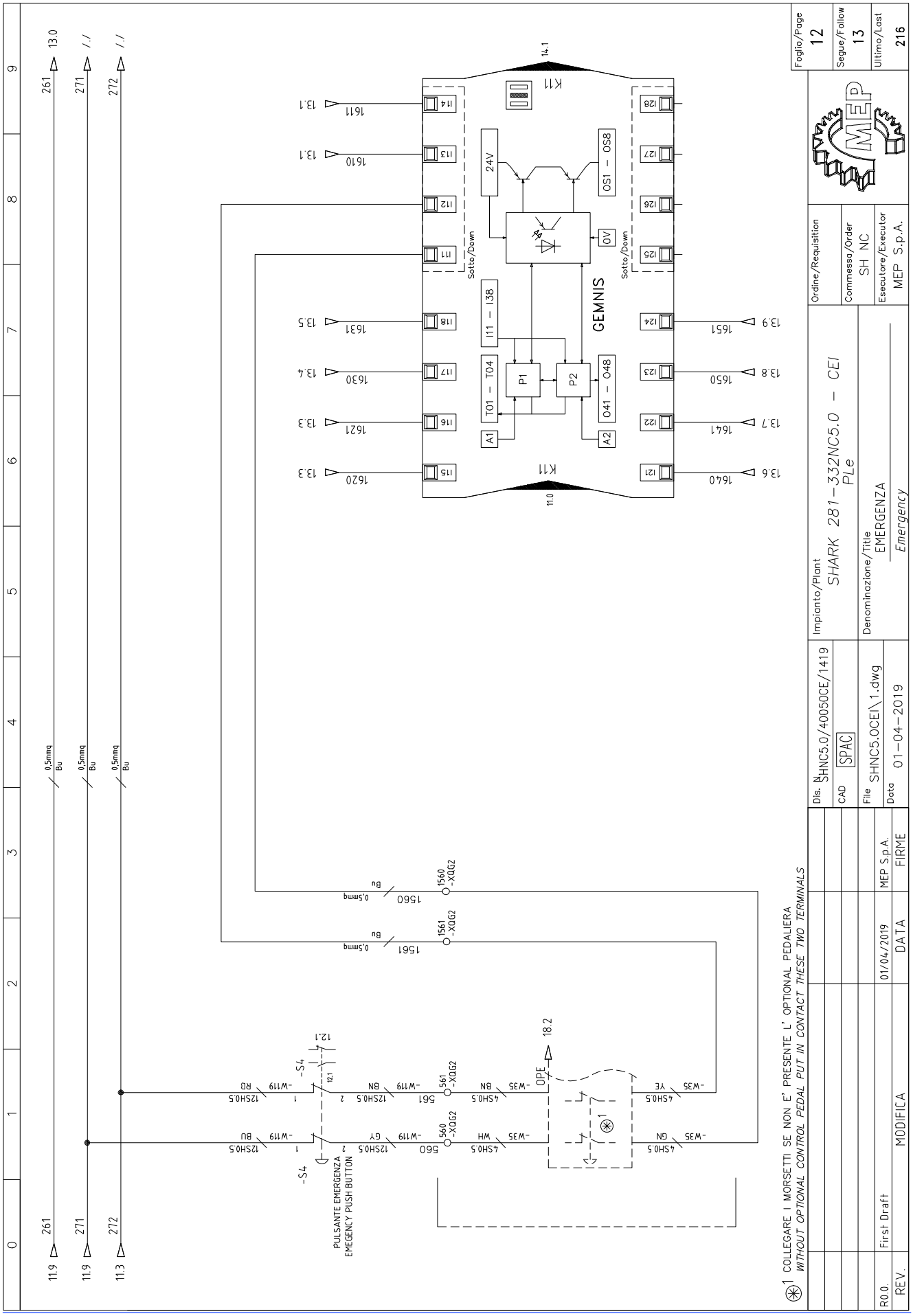

OPTIONAL
EVACUATORE TRUCIOLI
CHIP CONVEYOR
0,037KW, 1400Rpm, 230/400V, 2/1,15A
MOTORE DELLA SPAZZOLA
BRUSH MOTOR
-M5
-M4
-K06
-K6
-K5
-Q-K06
-Q-K5
-X-CK03
-X-CK03M
-XSA
-XSAPE
-XQGPE
-W7/1
-W7
-W6/C
-W6
4G0.75mmq
1,5mm²
BK
GNYE
BN
BK
GY
PE
Impianto/Plant
SHARK 281-332NC5.0 - CEI PLe
Denominazione/Title
ALIMENTAZIONE MOTORI 400V
Motor Power Supply 400V
Ordine/Requisition
Commessa/Order
SH NC
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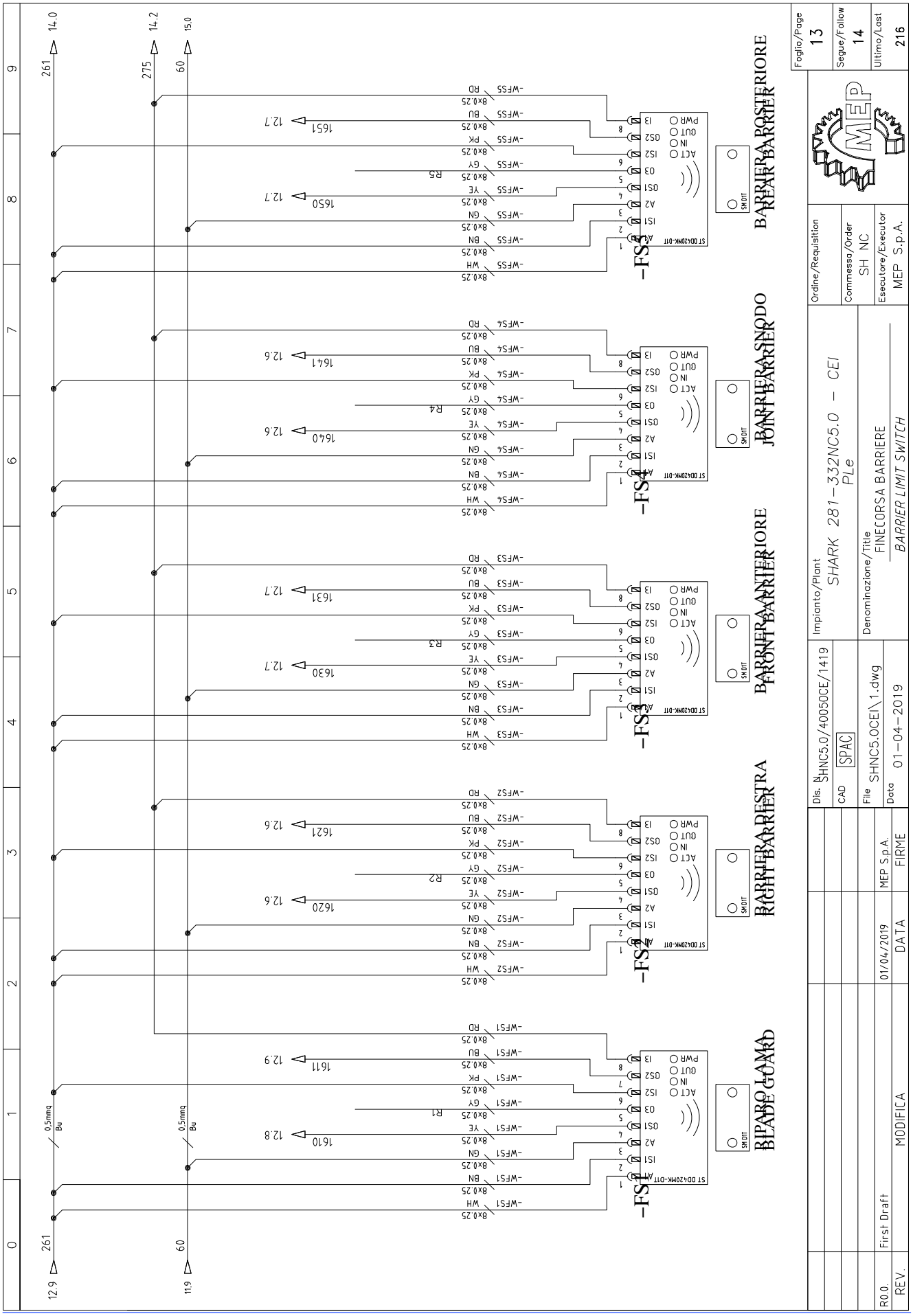

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Impianto/Plant SHARK 281-332NC5.0 - CEI PLe
Denominazione/Title ALIMENTAZIONE TRASFORMATORI
Transformer Power Supply
Dis. SHNC5.0/400500E/1419
CAD SPAC
File SHNC5.0CEI\1.dwg
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DATA
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REV. MODIFICA
-FT1 4A
-FT2 4A
-T2 500VA
0-230-400V, 0-55-60V, 0-220V
-F10 8A
-F15 4A
-F16 4A
-F17 2A
-G1 24Vcc/14A
AC DC
ALIMENTAZIONE DRIVER STEPPER
STEPPER DRIVER POWER SUPPLY
ALIMENTAZIONE AUX, USCITE, VENTOLA
AUX, OUTPUT, FAN POWER SUPPLY
PE
-XQGPE
1.5mm² BK
0.5mm² BU
1.5mm² YE/GN
1.5mm² GY
229
228
227
50
161
061
60

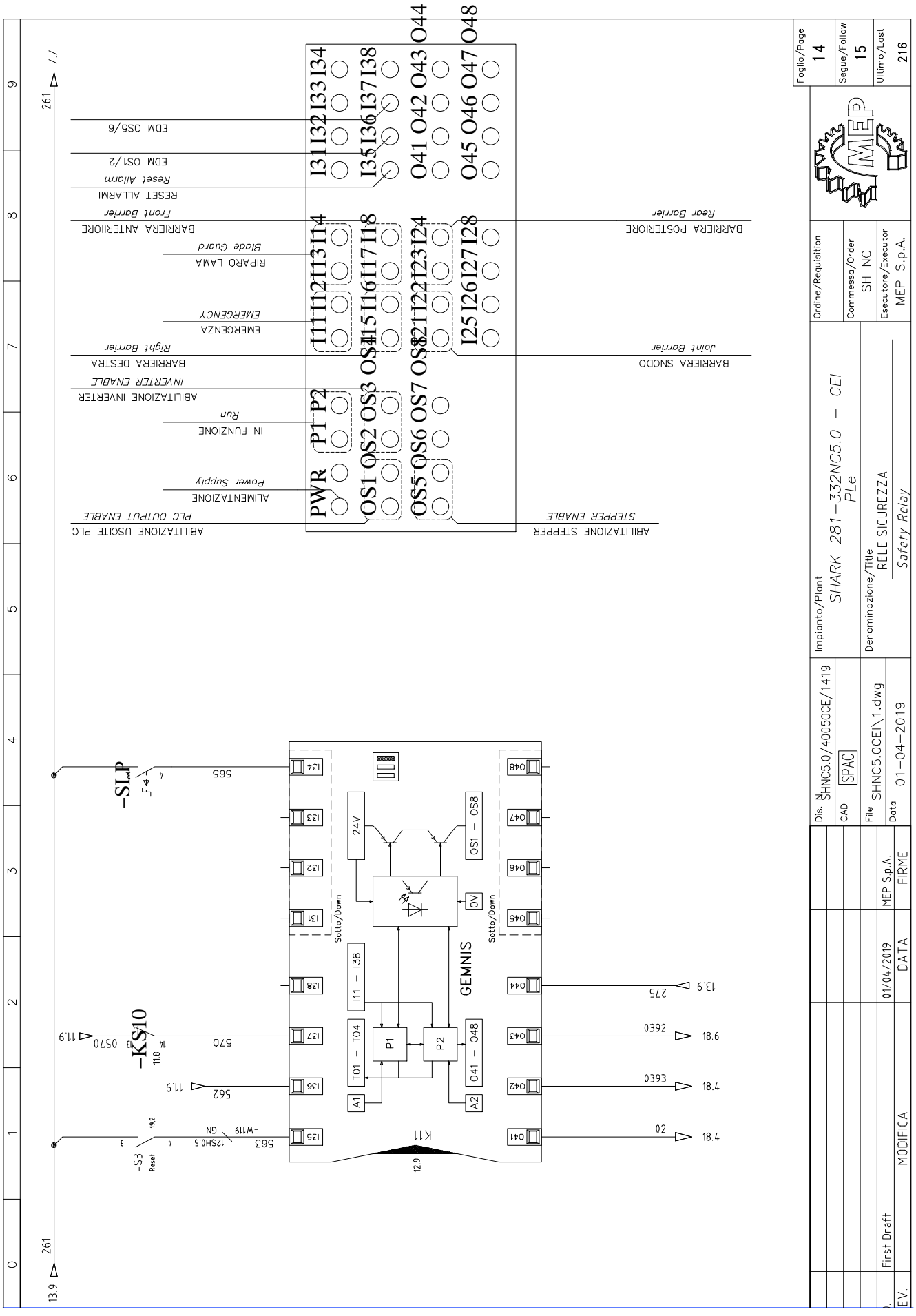

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Denominazione/Title ALIMENTAZIONE MOTORE STEPPER
Stepper Motor Power Supply
Dis. SHNC5.0/40050CE/1419
CAD SPAC
File SHNC5.OCEI\1.dwg
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DATA
MODIFICA
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-M8
MOTORE STEPPER ALIMENTATORE SHUTTLE STEPPER MOTOR 6,0A
ARANCIO
BIA/MERO
BIA/ARA
NERO
GIALLO
BIA/ROSA
BIA/GIA
ROSA
-W29 GNYE SG1.5 221
-W29 BN SG1.5 222
-W29 BK SG1.5 223
-W29 GY SG1.5 224
-W29 BU SG1.5
-TR2
B40
-XQGPE
PE
-U10
16.1
J1
B2
B1
A2
A2
AZIONAMENTO STEPPER DRIVE STEPPER 10A
J5
A1
A1
A2
-KS10
11.8
230
231
228
229
8.5
8.9
15.0

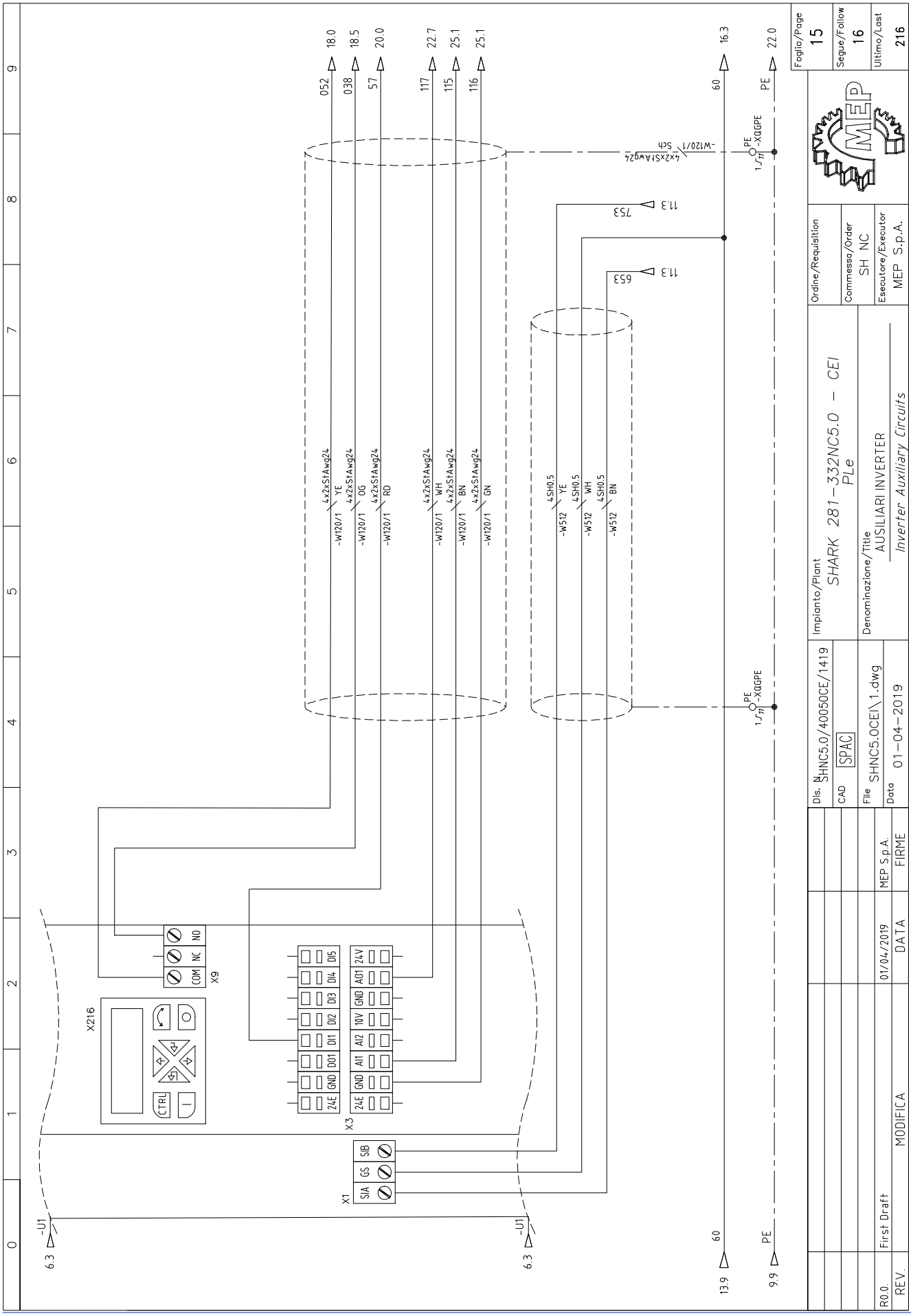

ALIMENTAZIONE PLC
POWER SUPPLY
ALIMENTAZIONE CIRCUITI SICUREZZA
EMERGENCY SAFETY CIRCUITS
ALIMENTAZIONE INGRESSI
INPUT POWER SUPPLY
ALIMENTAZIONE USCITE
OUTPUT POWER SUPPLY
VENTOLA QUADRO
FAN BOARD
20W 120x120mm
VENTOLA DRIVER
FAN DRIVER
12W 80x80mm
SHARK 281-332NC5.0 - CEI PLe
Auxiliary Circuit Power Supply
ALIMENTAZIONE AUSILIARI
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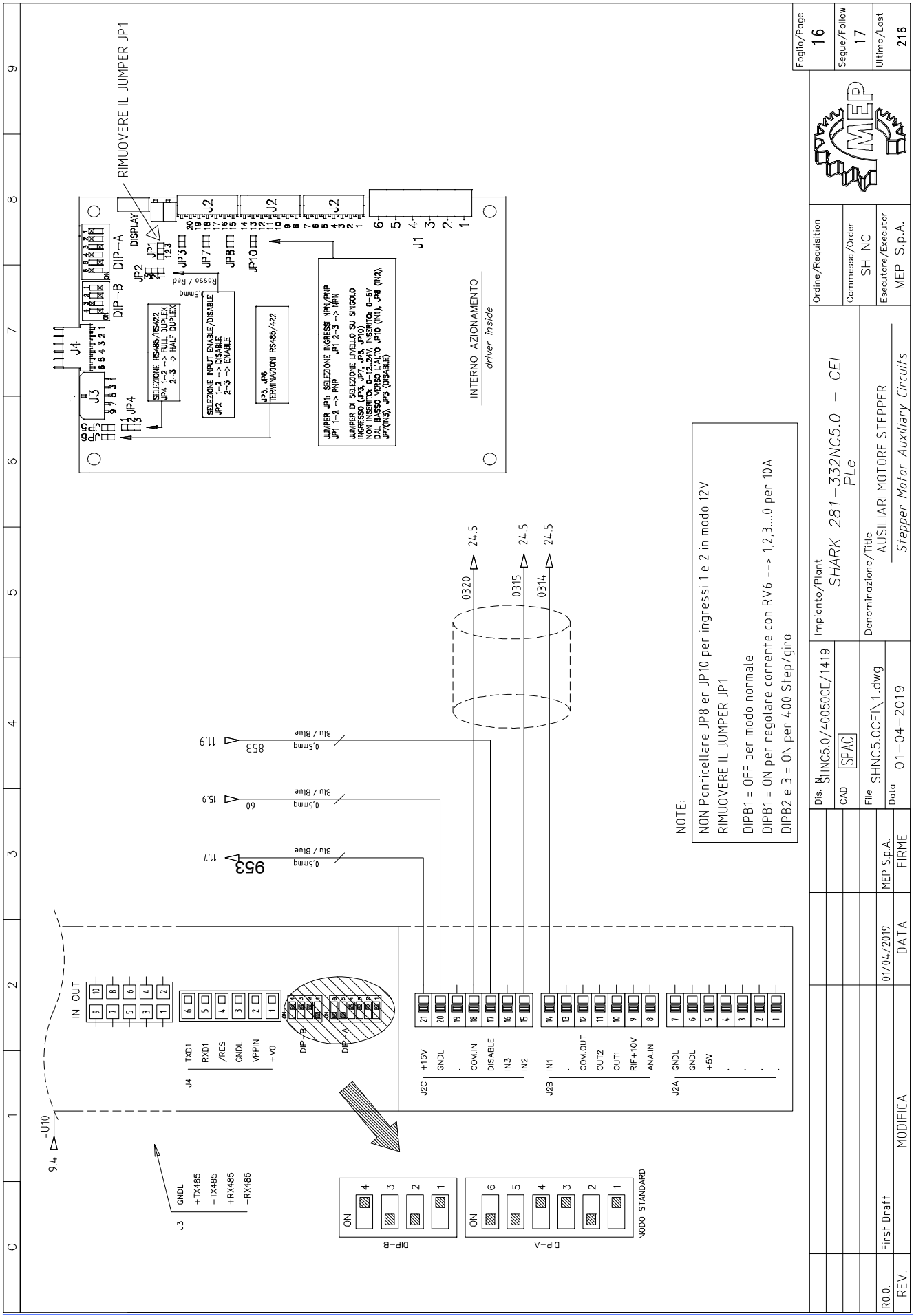

-KS10
-RSE2
-RSE1
-RSP1
CSMP308-M0
GEMNIS
Impianto/Plant
SHARK 281-332NC5.0 - CEI PLe
Denominazione/Title
RELE SICUREZZA
Safety relay
Esecutore/Executor
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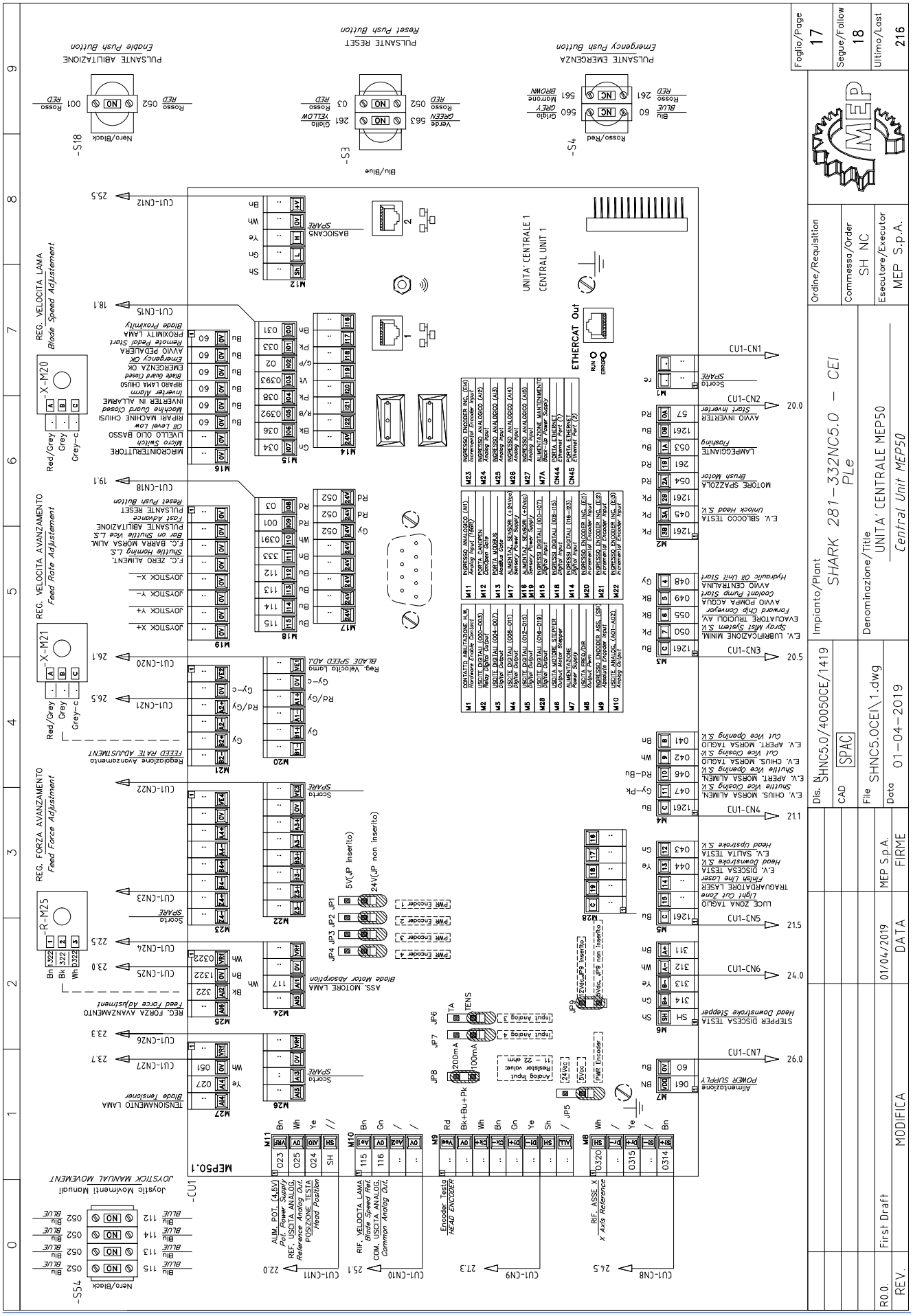

GEMNIS
Sotto/Down
Sotto/Down
24V
OS1 – OS8
0V
I11 – I38
T01 – T04
O41 – O48
P1
P2
A1
A2
K11
K11
14.1
11.0
261
271
272
13.0
11.9
11.9
11.3
0,5mmq Bu
PULSANTE EMERGENZA
EMEGENCY PUSH BUTTON
-S4
-S4
12.1
18.2
OPE
-XQG2
-W119
-W35
12SH0.5
4SH0.5
COLLEGARE I MORSETTI SE NON E' PRESENTE L' OPTIONAL PEDALIERA
WITHOUT OPTIONAL CONTROL PEDAL PUT IN CONTACT THESE TWO TERMINALS
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Commessa/Order SH NC
Esecutore/Executor MEP S.p.A.
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Denominazione/Title EMERGENZA
Emergency
Dis. SHNC5.0/400500CE/1419
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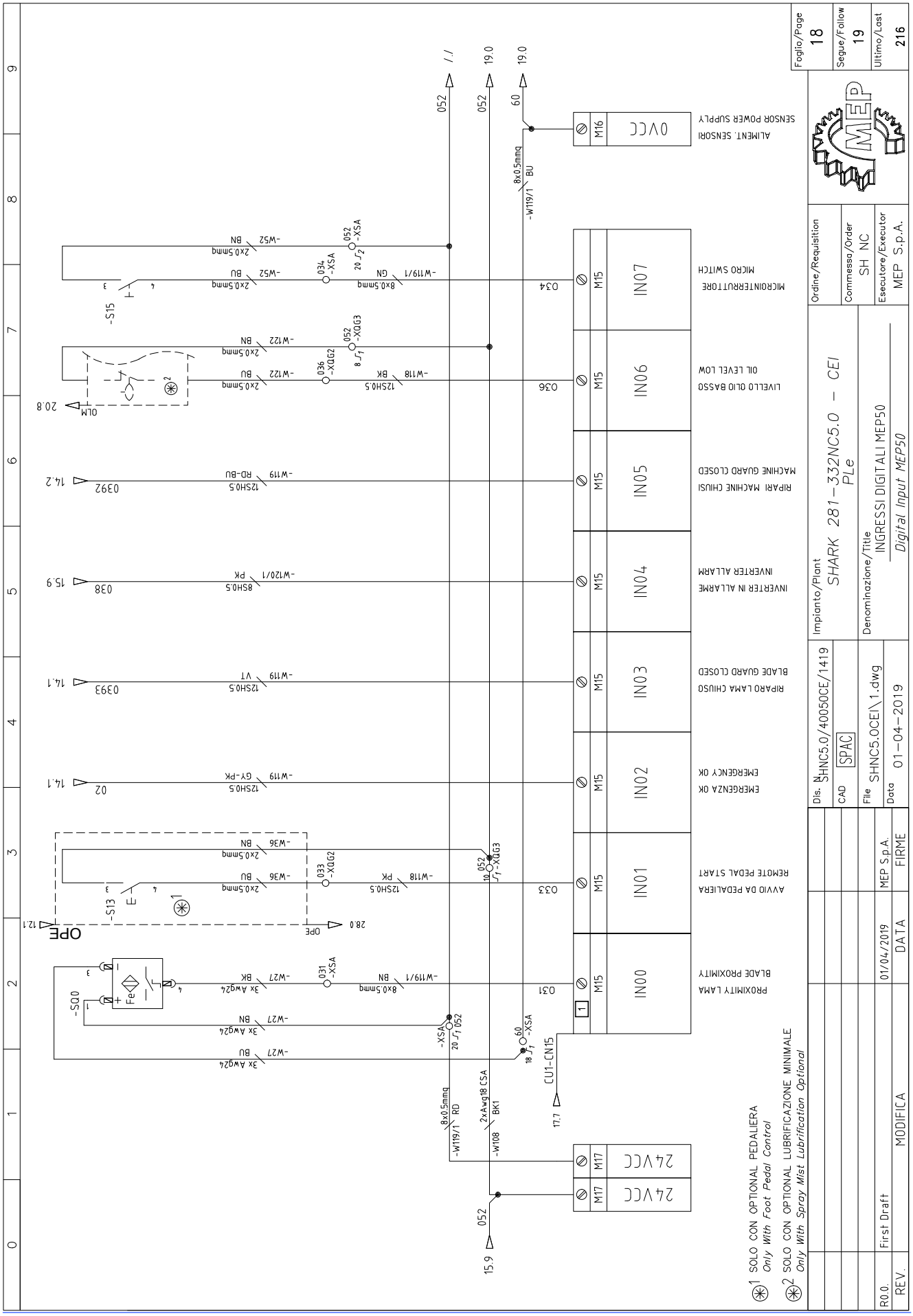

BARRIERA POSTERIORE
REAR BARRIER
BARRIERA CENTRALE
JOINT BARRIER
BARRIERA ANTERIORE
FRONT BARRIER
BARRIERA DESTRA
RIGHT BARRIER
BLADE GUARD
-FS1
-FS2
-FS3
-FS4
-FS5
ST DD420MK-DIT
SM DIT
-WFS1
-WFS2
-WFS3
-WFS4
-WFS5
8x0.25
WH
BN
GN
YE
GY
PK
BU
RD
0.5mmq
Bu
261
275
60
14.0
14.2
15.0
12.9
11.9
12.8
12.9
12.7
12.6
1610
1611
1620
1621
1630
1631
1640
1641
1650
1651
R1
R2
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R5
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Denominazione/Title
FINECORSA BARRIERE
BARRIER LIMIT SWITCH
Dis. SHNC5.0/40050CE/1419
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R0.0. First Draft 01/04/2019
REV. MODIFICA DATA

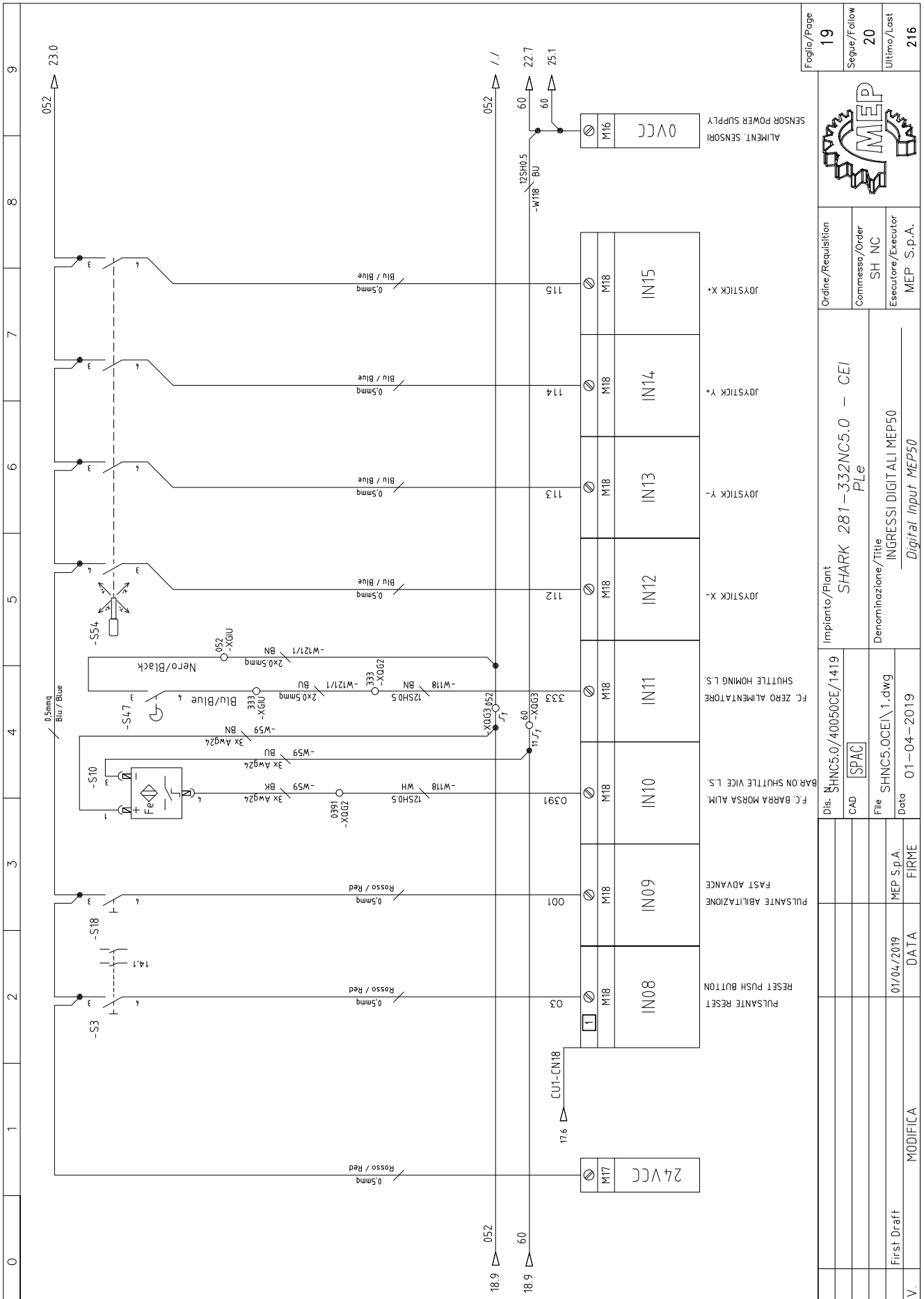

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Ordine/Requisition
Commessa/Order SH NC
Esecutore/Executor MEP S.p.A.
Impianto/Plant SHARK 281-332NC5.0 - CEI PLe
Denominazione/Title RELE SICUREZZA
Safety Relay
Dis. N°HNC5.0/40050CE/1419
CAD SPAC
File SHNC5.0CE\1.dwg
Data 01-04-2019
MEP S.p.A.
FIRME
01/04/2019
DATA
First Draft
MODIFICA
EV.
ABILITAZIONE USCITE PLC
PLC OUTPUT ENABLE
ALIMENTAZIONE
Power Supply
IN FUNZIONE
Run
ABILITAZIONE INVERTER
INVERTER ENABLE
BARRIERA DESTRA
Right Barrier
EMERGENZA
EMERGENCY
RIPARO LAMA
Blade Guard
BARRIERA ANTERIORE
Front Barrier
RESET ALLARMI
Reset Allarm
EDM OS1/2
EDM OS5/6
ABILITAZIONE STEPPER
STEPPER ENABLE
BARRIERA SNODO
Joint Barrier
BARRIERA POSTERIORE
Rear Barrier
PWR
P1 P2
OS1 OS2 OS3 OS4
OS5 OS6 OS7 OS8
I11 I12 I13 I14 I15 I16 I17 I18
I21 I22 I23 I24 I25 I26 I27 I28
I31 I32 I33 I34 I35 I36 I37 I38
O41 O42 O43 O44 O45 O46 O47 O48
-SLP
-KS10
-S3
Reset
GEMNIS
24V
0V
OS1 - OS8
I11 - I38
T01 - T04
O41 - O48
P1
P2
A1
A2
K11
Sotto/Down
565
570
562
563
-W119
12SH0.5
GN
0392
0393
02
275

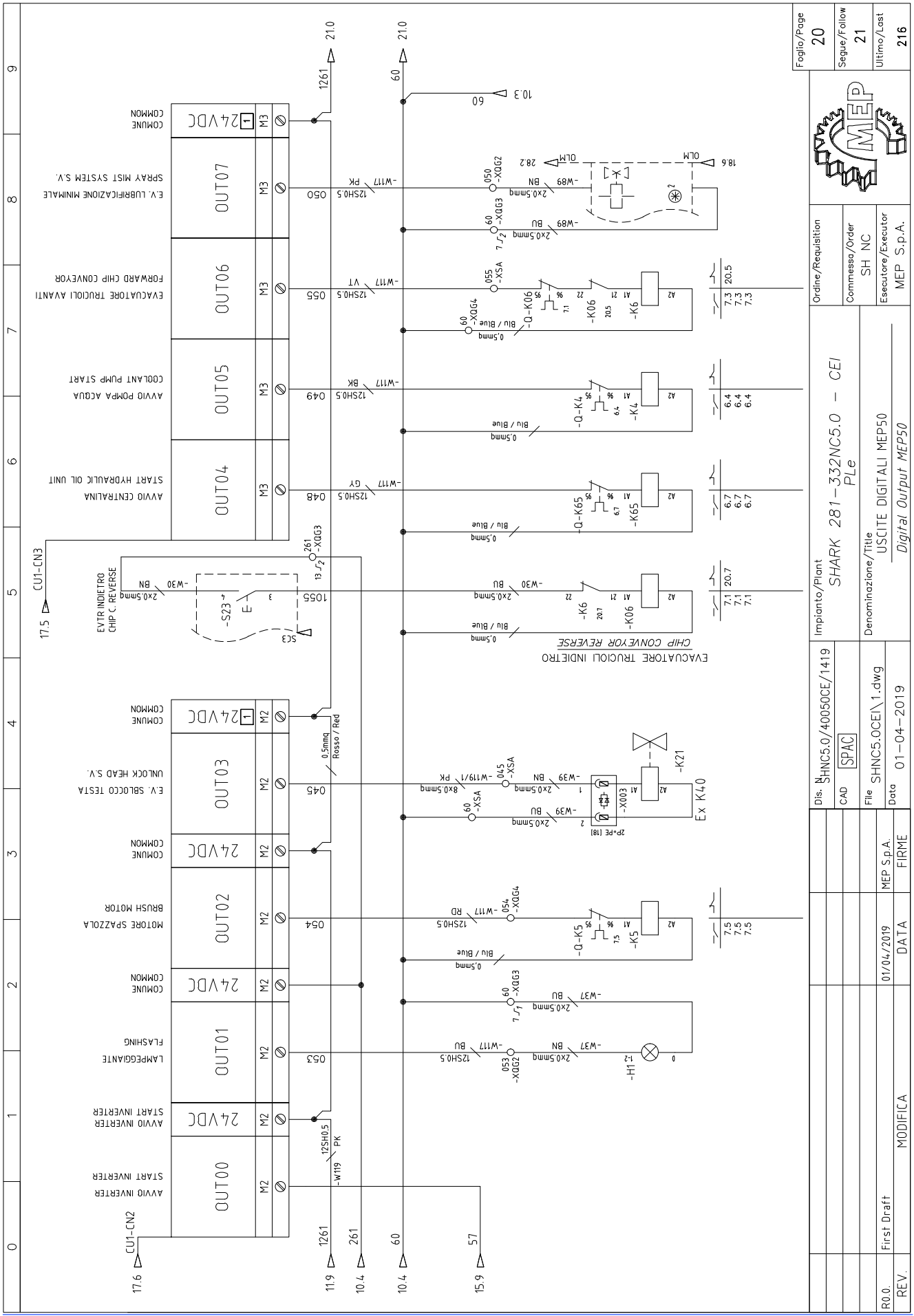

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Ordine/Requisition
Commessa/Order SH NC
Esecutore/Executor MEP S.p.A.
Impianto/Plant SHARK 281-332NC5.0 - CEI PLe
Denominazione/Title AUSILIARI INVERTER
Inverter Auxiliary Circuits
Dis. SHNC5.0/40050CE/1419
CAD SPAC
File SHNC5.OCEI\1.dwg
Data 01-04-2019
MEP S.p.A.
FIRME
01/04/2019
DATA
First Draft
MODIFICA
R0.0.
REV.
-U1
X1
X3
X9
X216
-W120/1
-W512
-XGGPE
-W120/1 Sch
4x2xStAwg24
4SH0.5
052
038
57
117
115
116
753
653
60
PE
CTRL
COM
NC
NO
SIA
GS
SIB
2VE
GND
DO1
DI1
DI2
DI3
DI4
DI5
AI1
AI2
10V
AO1
24V

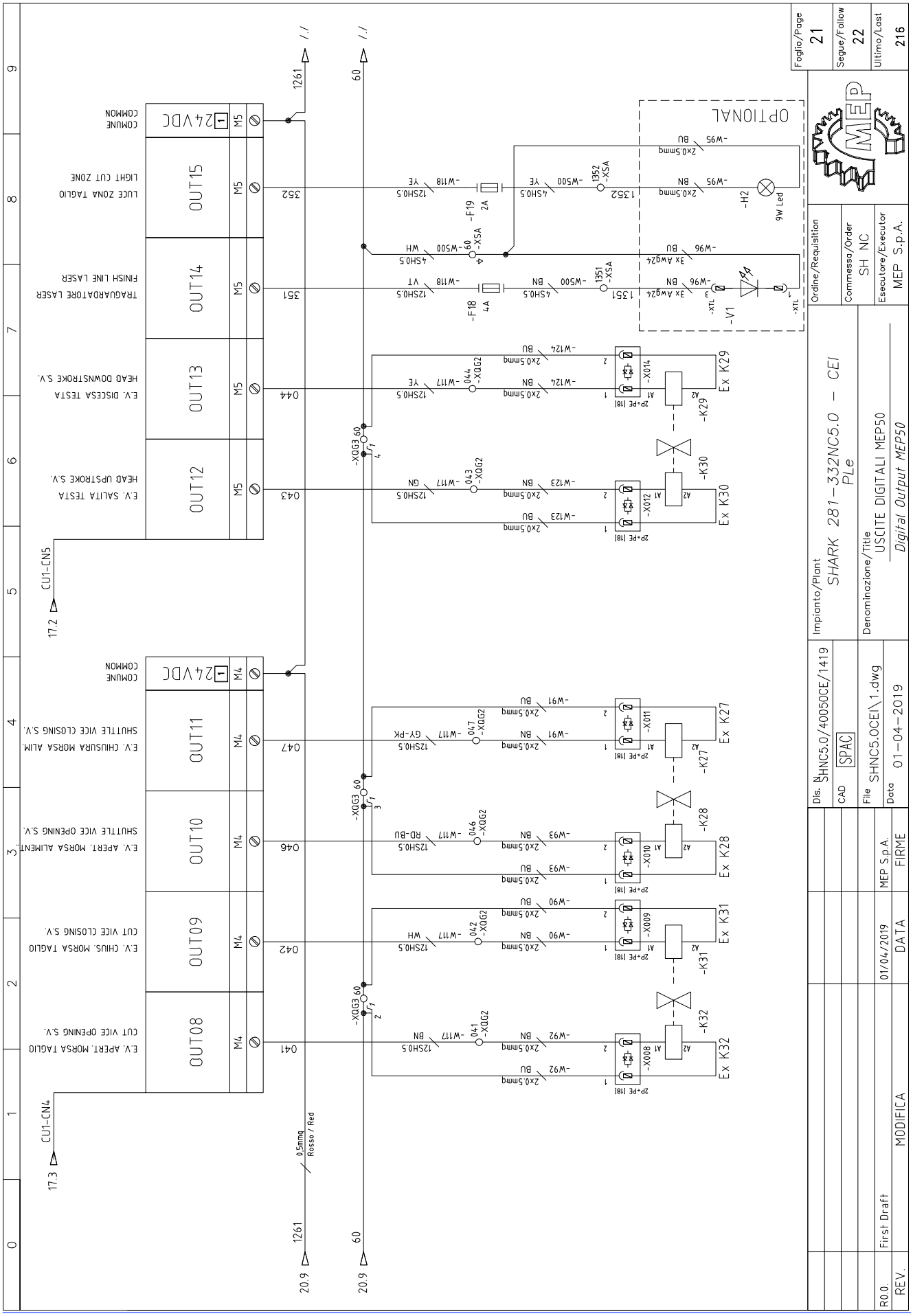

RIMUOVERE IL JUMPER JP1
DISPLAY
DIP-A
DIP-B
INTERNO AZIONAMENTO
driver inside
SELEZIONE RS485/RS422
JP4 1-2 -> FULL DUPLEX
2-3 -> HALF DUPLEX
SELEZIONE INPUT ENABLE/DISABLE
JP2 1-2 -> DISABLE
2-3 -> ENABLE
JP5, JP6
TERMINAZIONI RS485/422
JUMPER JP1: SELEZIONE INGRESSI NPN/PNP
JP1 1-2 -> PNP
JP1 2-3 -> NPN
JUMPER DI SELEZIONE LIVELLO SU SINGOLO
INGRESSO (JP3, JP7, JP8, JP10)
NON INSERITO: 0-12..24V, INSERITO: 0-5V
DIP1 INSERITO: LIVELLO JP10 (IN1), JP8 (IN2),
JP7(IN3), JP3 (DISABLE)
Rosso / Red
0,5mm
J1
J2
J3
J4
JP1
JP2
JP3
JP7
JP8
JP10
0320
0315
0314
24.5
953
853
60
11.7
11.9
15.9
Blu / Blue
IN OUT
TXD1
RXD1
/RES
GNDL
VPPIN
+V0
+15V
GNDL
COM.IN
DISABLE
IN3
IN2
IN1
COM.OUT
OUT2
OUT1
RIF+10V
ANA.IN
+5V
-U10
9.4
+TX485
-TX485
+RX485
-RX485
ON
NODO STANDARD
NOTE:
NON Ponticellare JP8 er JP10 per ingressi 1 e 2 in modo 12V
RIMUOVERE IL JUMPER JP1
DIPB1 = OFF per modo normale
DIPB1 = ON per regolare corrente con RV6 --> 1,2,3....0 per 10A
DIPB2 e 3 = ON per 400 Step/giro
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Ultimo/Last 216
Ordine/Requisition
Commessa/Order SH NC
Esecutore/Executor MEP S.p.A.
Impianto/Plant SHARK 281-332NC5.0 - CEI PLe
Denominazione/Title AUSILIARI MOTORE STEPPER
Stepper Motor Auxiliary Circuits
Dis. SHNC5.0/400500E/1419
CAD SPAC
File SHNC5.0CEI\1.dwg
Data 01-04-2019
MEP S.p.A.
FIRME
DATA
MODIFICA
First Draft
01/04/2019
R0.0
REV.

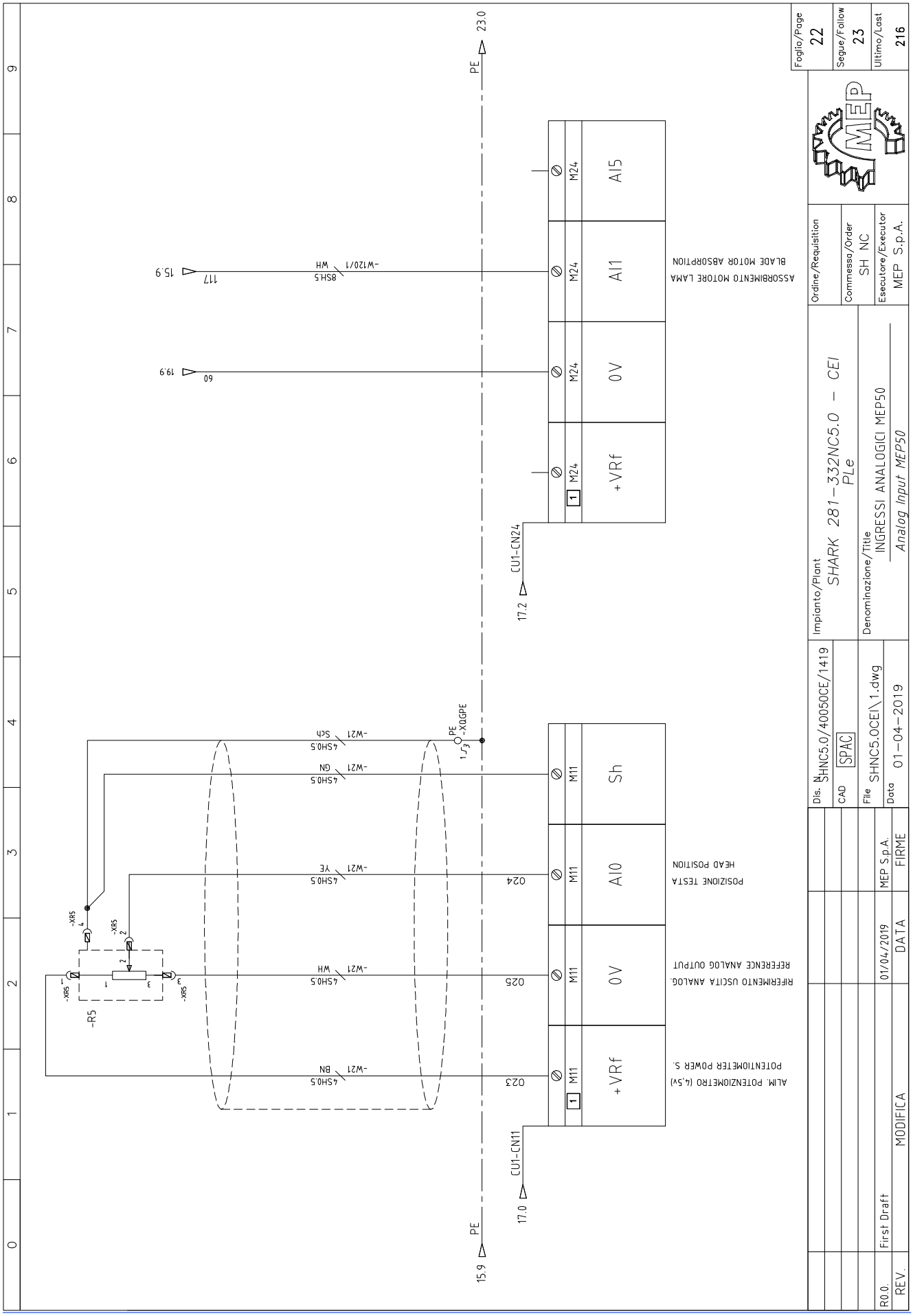

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Commessa/Order SH NC
Esecutore/Executor MEP S.p.A.
Impianto/Plant SHARK 281-332NC5.0 - CEI PLe
Denominazione/Title UNITA' CENTRALE MEP50
Central Unit MEP50
Dis. SHNC5.0/400500E/1419
CAD SPAC
File SHNC5.0CEI\1.dwg
Data 01-04-2019
MEP S.p.A.
FIRME
01/04/2019
DATA
MODIFICA
First Draft
REV.
R0.0.
PULSANTE ABILITAZIONE
Enable Push Button
PULSANTE RESET
Reset Push Button
PULSANTE EMERGENZA
Emergency Push Button
UNITA' CENTRALE 1
CENTRAL UNIT 1
ETHERCAT Out
REG. VELOCITA LAMA
Blade Speed Adjustement
REG. VELOCITA AVANZAMENTO
Feed Rate Adjustement
REG. FORZA AVANZAMENTO
Feed Force Adjustement
JOYSTICK MANUAL MOVEMENT
Joystic Movimenti Manuali
ME P50.1
-CU1

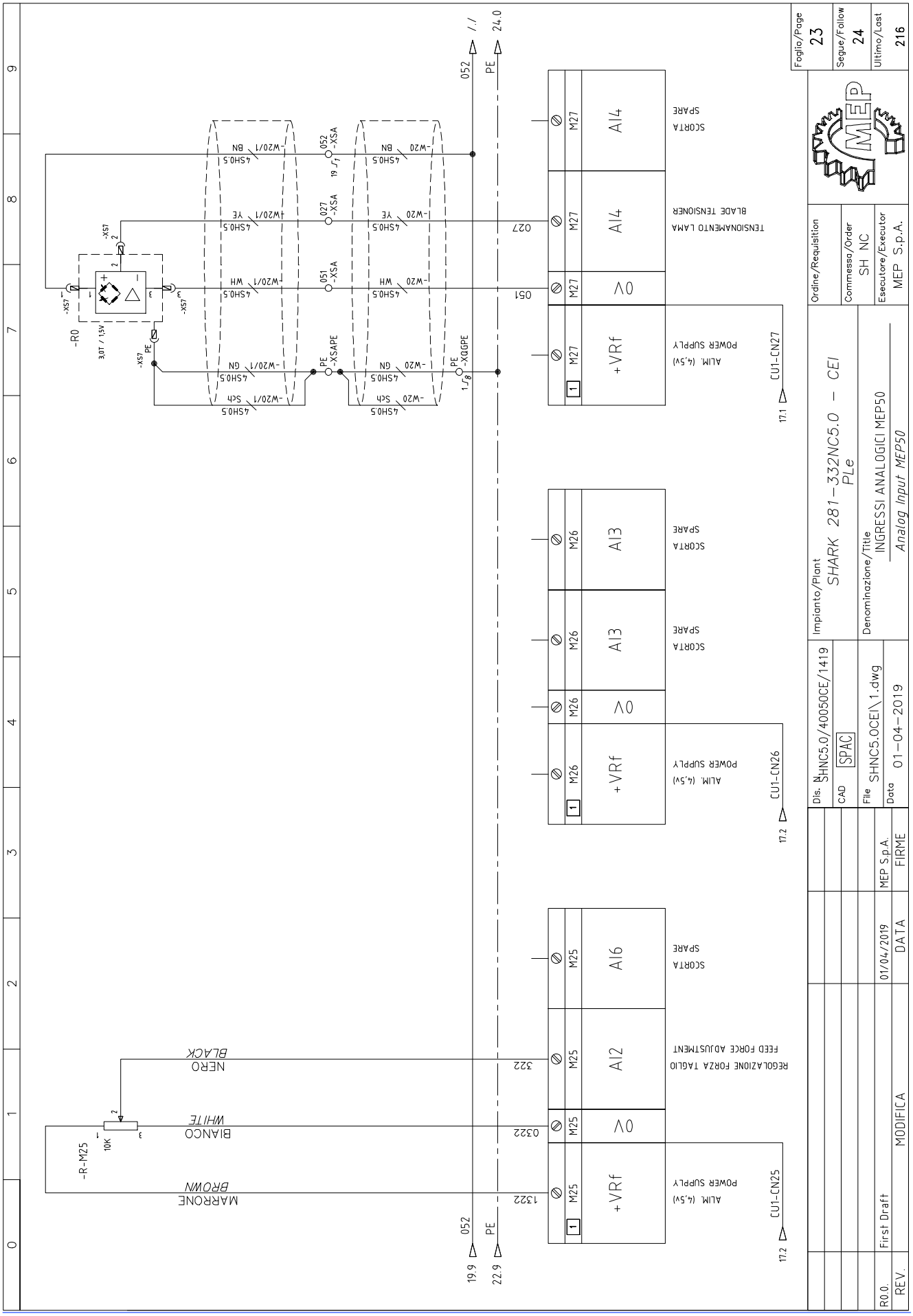

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Commessa/Order SH NC
Esecutore/Executor MEP S.p.A.
Impianto/Plant SHARK 281-332NC5.0 - CEI PLe
Denominazione/Title INGRESSI DIGITALI MEP50
Digital Input MEP50
Dis. N°NC5.0/400500E/1419
CAD SPAC
File SHNC5.0CEI\1.dwg
Data 01-04-2019
MEP S.p.A.
FIRME
DATA
01/04/2019
First Draft
MODIFICA
REV.
R0.0
IN00 BLADE PROXIMITY LAMA
IN01 REMOTE PEDAL START AVVIO DA PEDALIERA
IN02 EMERGENCY OK EMERGENZA OK
IN03 BLADE GUARD CLOSED RIPARO LAMA CHIUSO
IN04 INVERTER IN ALLARME INVERTER ALLARM
IN05 MACHINE GUARD CLOSED RIPARI MACHINE CHIUSI
IN06 OIL LEVEL LOW LIVELLO OLIO BASSO
IN07 MICRO SWITCH MICROINTERRUTTORE
0VCC SENSOR POWER SUPPLY ALIMENT. SENSORI
24VCC
24VCC
-S0
-S13
-S15
-XSA
-XQG2
-XQG3
-W119/1 8x0.5mmq BU
-W27 3x Awg24 BK
-W27 3x Awg24 BU
-W27 3x Awg24 BN
-W36 2x0.5mmq BU
-W36 2x0.5mmq BN
-W122 2x0.5mmq BU
-W122 2x0.5mmq BN
-W118 12SH0.5 BK
-W119 12SH0.5 GY-PK
-W119 12SH0.5 VT
-W120/1 8SH0.5 PK
-W119 12SH0.5 RD-BU
-W119/1 8x0.5mmq GN
-W52 2x0.5mmq BU
-W52 2x0.5mmq BN
-W119/1 8x0.5mmq RD
-W108 2xAwg18 CSA BK1
CU1-CN15
OPE
DLM
SOLO CON OPTIONAL PEDALIERA
Only With Foot Pedal Control
SOLO CON OPTIONAL LUBRIFICAZIONE MINIMALE
Only With Spray Mist Lubrification Optional

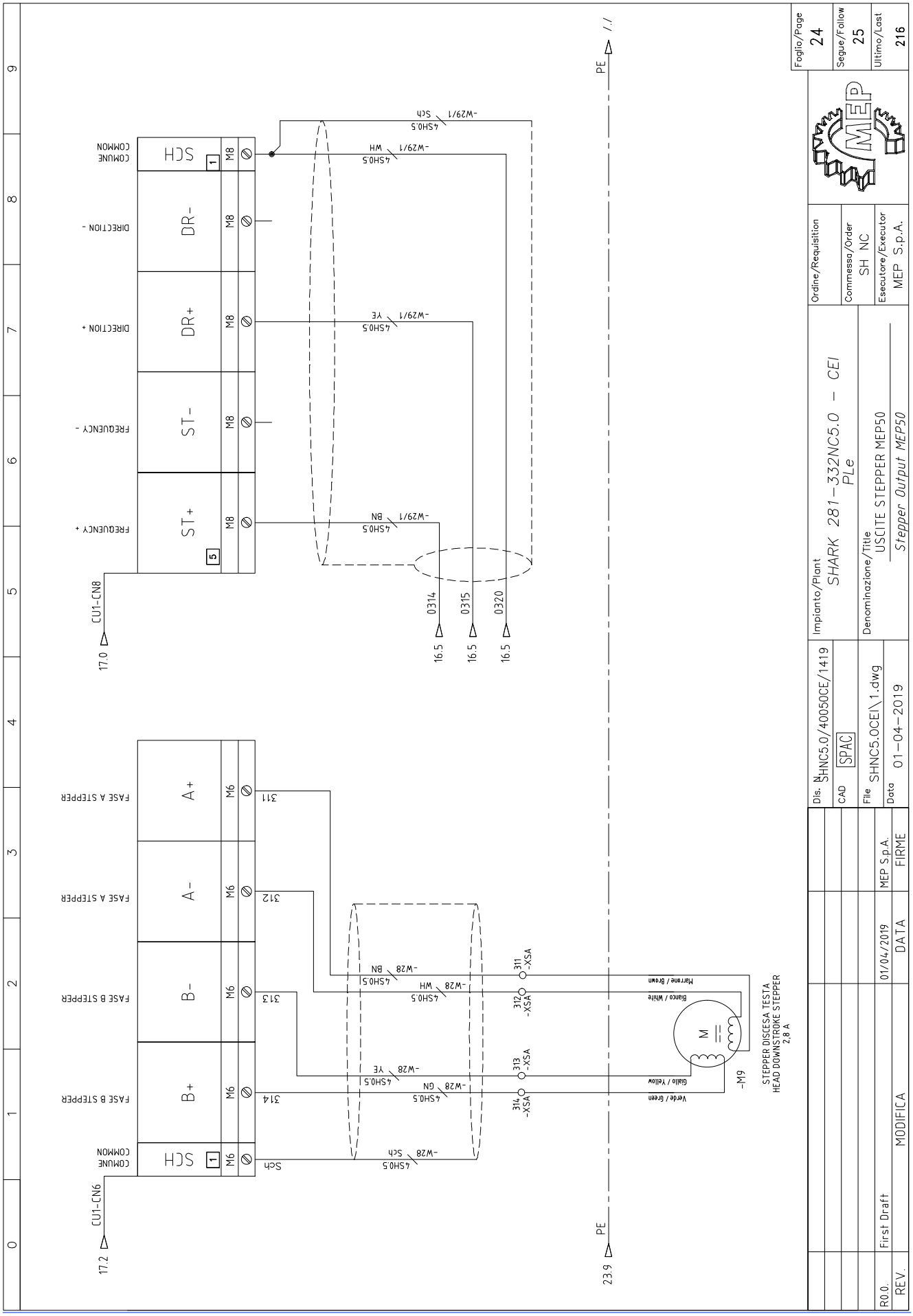

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Esecutore/Executor MEP S.p.A.
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Denominazione/Title INGRESSI DIGITALI MEP50
Digital Input MEP50
Dis. N°SHNC5.0/40050CE/1419
CAD SPAC
File SHNC5.OCEI\1.dwg
Data 01-04-2019
MEP S.p.A.
FIRME
01/04/2019
DATA
R0.0. First Draft
REV. MODIFICA
0VCC
24VCC
IN08
IN09
IN10
IN11
IN12
IN13
IN14
IN15
RESET PUSH BUTTON
PULSANTE RESET
FAST ADVANCE
PULSANTE ABILITAZIONE
BAR ON SHUTTLE VICE L.S.
F.C. BARRA MORSA ALIM.
SHUTTLE HOMING L.S.
F.C. ZERO ALIMENTATORE
JOYSTICK X-
JOYSTICK Y-
JOYSTICK Y+
JOYSTICK X+
SENSOR POWER SUPPLY
ALIMENT. SENSORI
-S3
-S18
-S10
-S47
-S54
Nero/Black
Blu/Blue
Blu / Blue
Rosso / Red
0,5mmq
2x0,5mmq
3x AWG24
12SH0.5
-W118
-W59
-W121/1
-XQG2
-XQG3
-XGIU
CU1-CN18

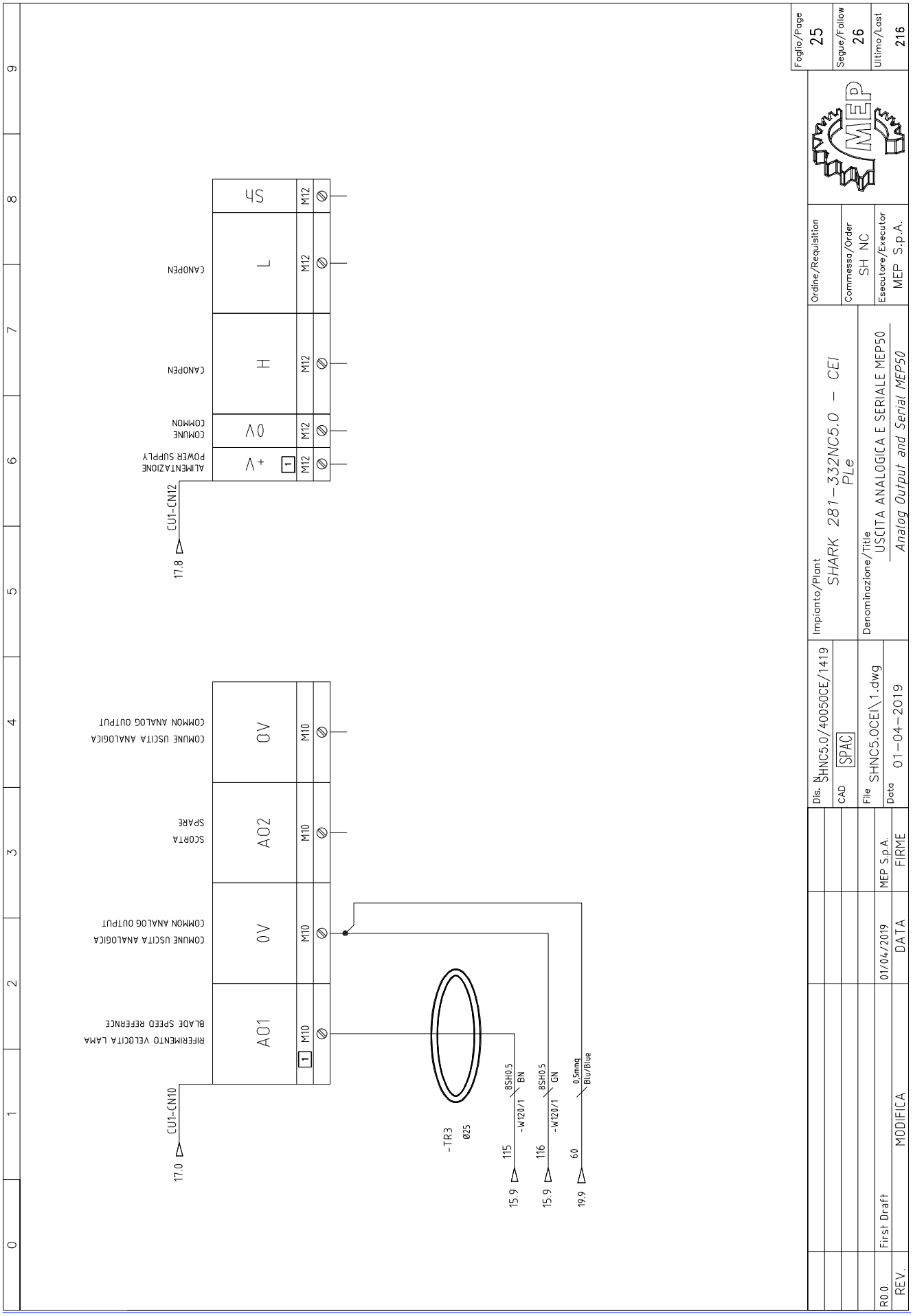

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Commessa/Order SH NC
Esecutore/Executor MEP S.p.A.
Impianto/Plant SHARK 281-332NC5.0 - CEI PLe
Denominazione/Title USCITE DIGITALI MEP50
Digital Output MEP50
Dis. SHNC5.0/400500E/1419
CAD SPAC
File SHNC5.0CEI\1.dwg
Data 01-04-2019
MEP S.p.A.
DATA
FIRME
01/04/2019
First Draft
MODIFICA
R0.0
REV.
CU1-CN2
CU1-CN3
OUT00
OUT01
OUT02
OUT03
OUT04
OUT05
OUT06
OUT07
24VDC
COMMON
AVVIO INVERTER
START INVERTER
LAMPEGGIANTE
FLASHING
MOTORE SPAZZOLA
BRUSH MOTOR
E.V. SBLOCCO TESTA
UNLOCK HEAD S.V.
AVVIO CENTRALINA
START HYDRAULIC OIL UNIT
AVVIO POMPA ACQUA
COOLANT PUMP START
EVACUATORE TRUCIOLI AVANTI
FORWARD CHIP CONVEYOR
E.V. LUBRIFICAZIONE MINIMALE
SPRAY MIST SYSTEM S.V.
EVTR.INDIETRO
CHIP C. REVERSE
EVACUATORE TRUCIOLI INDIETRO
CHIP CONVEYOR REVERSE
Ex K40

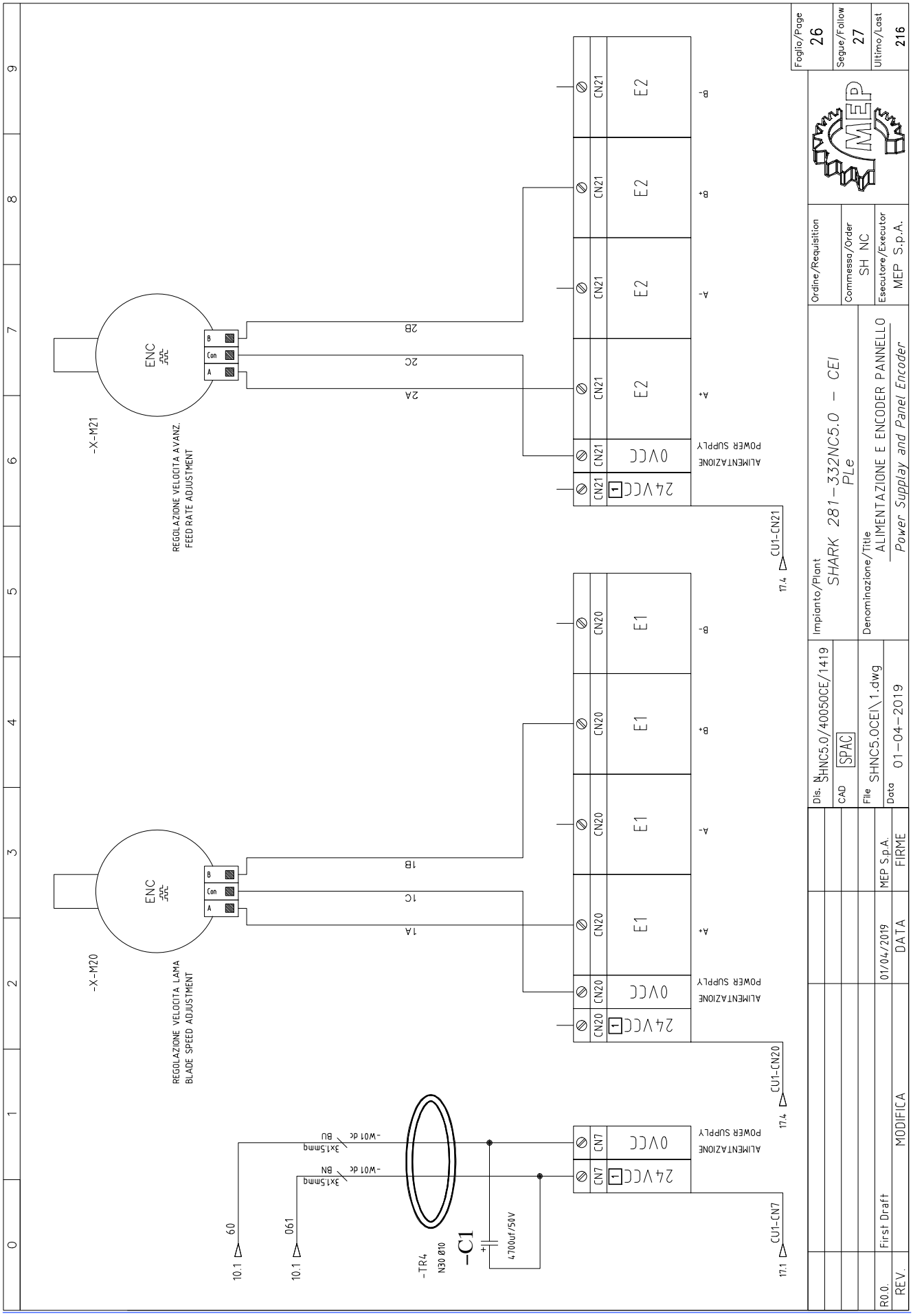

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Impianto/Plant SHARK 281-332NC5.0 - CEI PLe
Denominazione/Title USCITE DIGITALI MEP50 Digital Output MEP50
Commessa/Order SH NC
Esecutore/Executor MEP S.p.A.
Ordine/Requisition
Dis. SHNC5.0/40050CE/1419
CAD SPAC
File SHNC5.OCEI\1.dwg
Data 01-04-2019
MEP S.p.A.
FIRME
01/04/2019
DATA
First Draft
MODIFICA
REV.
R0.0.
OPTIONAL
OUT08
OUT09
OUT10
OUT11
OUT12
OUT13
OUT14
OUT15
24VDC
COMMON
CUT VICE OPENING S.V.
E.V. APERT. MORSA TAGLIO
CUT VICE CLOSING S.V.
E.V. CHIUS. MORSA TAGLIO
SHUTTLE VICE OPENING S.V.
E.V. APERT. MORSA ALIMENT.
SHUTTLE VICE CLOSING S.V.
E.V. CHIUSURA MORSA ALIM.
HEAD UPSTROKE S.V.
E.V. SALITA TESTA
HEAD DOWNSTROKE S.V.
E.V. DISCESA TESTA
FINISH LINE LASER
TRAGUARDATORE LASER
LIGHT CUT ZONE
LUCE ZONA TAGLIO
CU1-CN4
CU1-CN5
0,5mmq Rosso / Red
Ex K27
Ex K28
Ex K29
Ex K30
Ex K31
Ex K32
-K27
-K28
-K29
-K30
-K31
-K32
-H2 9W Led
-V1
-F18 4A
-F19 2A
-XSA
-XQG2
-XQG3
-X007
-X008
-X009
-X010
-X011
-X012
-X014
-W91
-W92
-W93
-W90
-W123
-W124
-W96
-W95
-W500
-W118
-W117
-W97
2x0,5mmq
4SH0,5
12SH0,5
3x Awg24
2P+PE (18)
1261
60
17.2
17.3
20.9
352
351
044
043
047
046
042
041

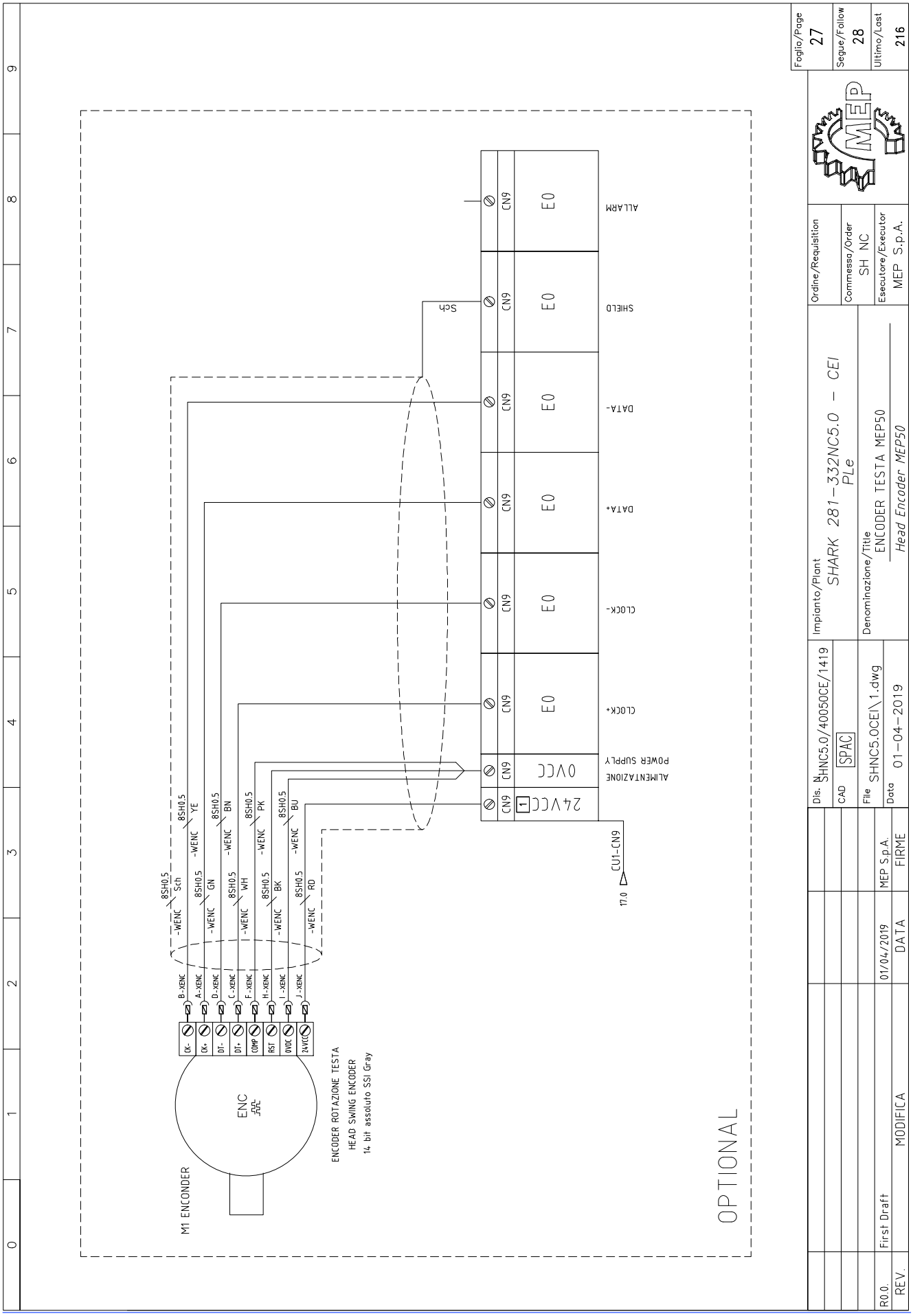

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Ordine/Requisition
Commessa/Order SH NC
Esecutore/Executor MEP S.p.A.
Impianto/Plant SHARK 281-332NC5.0 - CEI PLe
Denominazione/Title INGRESSI ANALOGICI MEP50
Analog Input MEP50
Dis. SHNC5.0/400500E/1419
CAD SPAC
File SHNC5.0CEI\1.dwg
Data 01-04-2019
MEP S.p.A.
FIRME
DATA
01/04/2019
First Draft
MODIFICA
R0.0
REV.
ASSORBIMENTO MOTORE LAMA
BLADE MOTOR ABSORPTION
POSIZIONE TESTA
HEAD POSITION
RIFERIMENTO USCITA ANALOG.
REFERENCE ANALOG OUTPUT
ALIM. POTENZIOMETRO (4,5V)
POTENTIOMETER POWER S.
AI5
AI1
AI0
Sh
0V
+VRf
M24
M11
CU1-CN24
CU1-CN11
PE
-W120/1
-W21
-R5
-XR5
-X0GPE

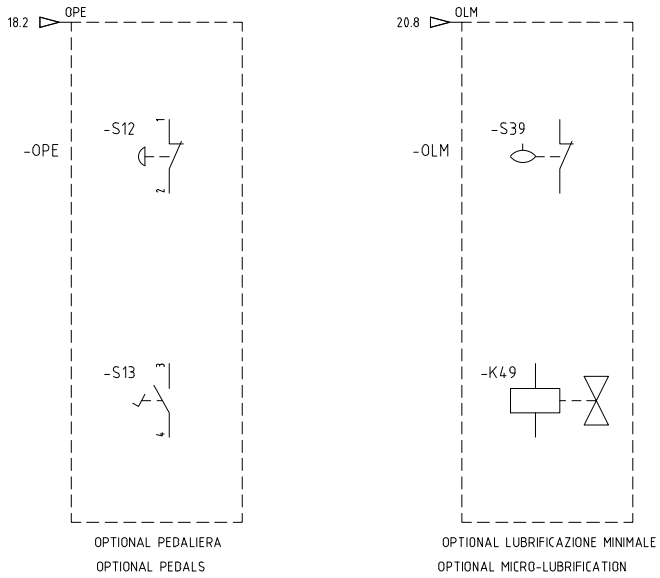

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Esecutore/Executor MEP S.p.A.
Impianto/Plant SHARK 281-332NC5.0 - CEI PLe
Denominazione/Title INGRESSI ANALOGICI MEP50
Analog Input MEP50
Dis. SHNC5.0/40050CE/1419
CAD SPAC
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Data 01-04-2019
MEP S.p.A.
FIRME
01/04/2019
DATA
R0.0. First Draft
REV. MODIFICA
AI4
AI3
AI6
AI2
+VRf
SCORTA SPARE
POWER SUPPLY
ALIM. (4,5V)
TENSIONAMENTO LAMA
BLADE TENSIONER
REGOLAZIONE FORZA TAGLIO
FEED FORCE ADJUSTMENT
MARRONE BROWN
BIANCO WHITE
NERO BLACK
-R-M25
-R0
CU1-CN27
CU1-CN26
CU1-CN25
052
PE
024.0
22.9
19.9
17.1
17.2


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Commessa/Order SH NC
Esecutore/Executor MEP S.p.A.
Impianto/Plant SHARK 281-332NC5.0 - CEI PLe
Denominazione/Title USCITE STEPPER MEP50
Stepper Output MEP50
Dis. SHNC5.0/400500E/1419
CAD SPAC
File SHNC5.0CEI\1.dwg
Data 01-04-2019
MEP S.p.A.
FIRME
DATA 01/04/2019
First Draft
MODIFICA
REV. R0.0
PE
CU1-CN8
CU1-CN6
SCH
COMMUNE COMMON
ST+
ST-
DR+
DR-
FREQUENCY +
FREQUENCY -
DIRECTION +
DIRECTION -
FASE A STEPPER
FASE B STEPPER
M6
M8
-W29/1
-W28
4SH0.5
BN
WH
YE
Sch
GN
0314
0315
0320
311
312
313
314
-XSA
-M9
M
Bianco / White
Marrone / Brown
Giallo / Yellow
Verde / Green
STEPPER DISCESA TESTA
HEAD DOWNSTROKE STEPPER
2.8 A


CU1-CN12
17.8
ALIMENTAZIONE
POWER SUPPLY
+V
0V
COMUNE
COMMON
H
CANOPEN
L
CANOPEN
SH
M12
CU1-CN10
17.0
RIFERIMENTO VELOCITA LAMA
BLADE SPEED REFERENCE
A01
0V
COMUNE USCITA ANALOGICA
COMMON ANALOG OUTPUT
SCORTA
SPARE
A02
0V
COMUNE USCITA ANALOGICA
COMMON ANALOG OUTPUT
M10
-TR3
Ø25
115
116
60
8SH0.5
BN
GN
0,5mmq
Blu/Blue
-W120/1
15.9
19.9
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Commessa/Order SH NC
Esecutore/Executor MEP S.p.A.
Impianto/Plant SHARK 281-332NC5.0 - CEI PLe
Denominazione/Title USCITA ANALOGICA E SERIALE MEP50
Analog Output and Serial MEP50
Dis. N SHNC5.0/40050CE/1419
CAD SPAC
File SHNC5.OCEI\1.dwg
Data 01-04-2019
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REV. MODIFICA DATA


-X-M21
REGOLAZIONE VELOCITA AVANZ.
FEED RATE ADJUSTMENT
-X-M20
REGOLAZIONE VELOCITA LAMA
BLADE SPEED ADJUSTMENT
ENC
B
Con
A
2B
2C
2A
1B
1C
1A
ALIMENTAZIONE
POWER SUPPLY
24VCC
0VCC
CN21
CN20
CN7
E1
E2
A+
A-
B+
B-
CU1-CN21
CU1-CN20
CU1-CN7
17.4
17.1
-C1
4700uf/50V
-TR4
N30 Ø10
-W01 dc
3x1.5mmq
BU
BN
60
061
10.1
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Commessa/Order
SH NC
Esecutore/Executor
MEP S.p.A.
Impianto/Plant
SHARK 281-332NC5.0 - CEI
PLe
Denominazione/Title
ALIMENTAZIONE E ENCODER PANNELLO
Power Supplay and Panel Encoder
Dis. N°SHNC5.0/400500E/1419
CAD SPAC
File SHNC5.0CEI\1.dwg
Data 01-04-2019
MEP S.p.A.
FIRME
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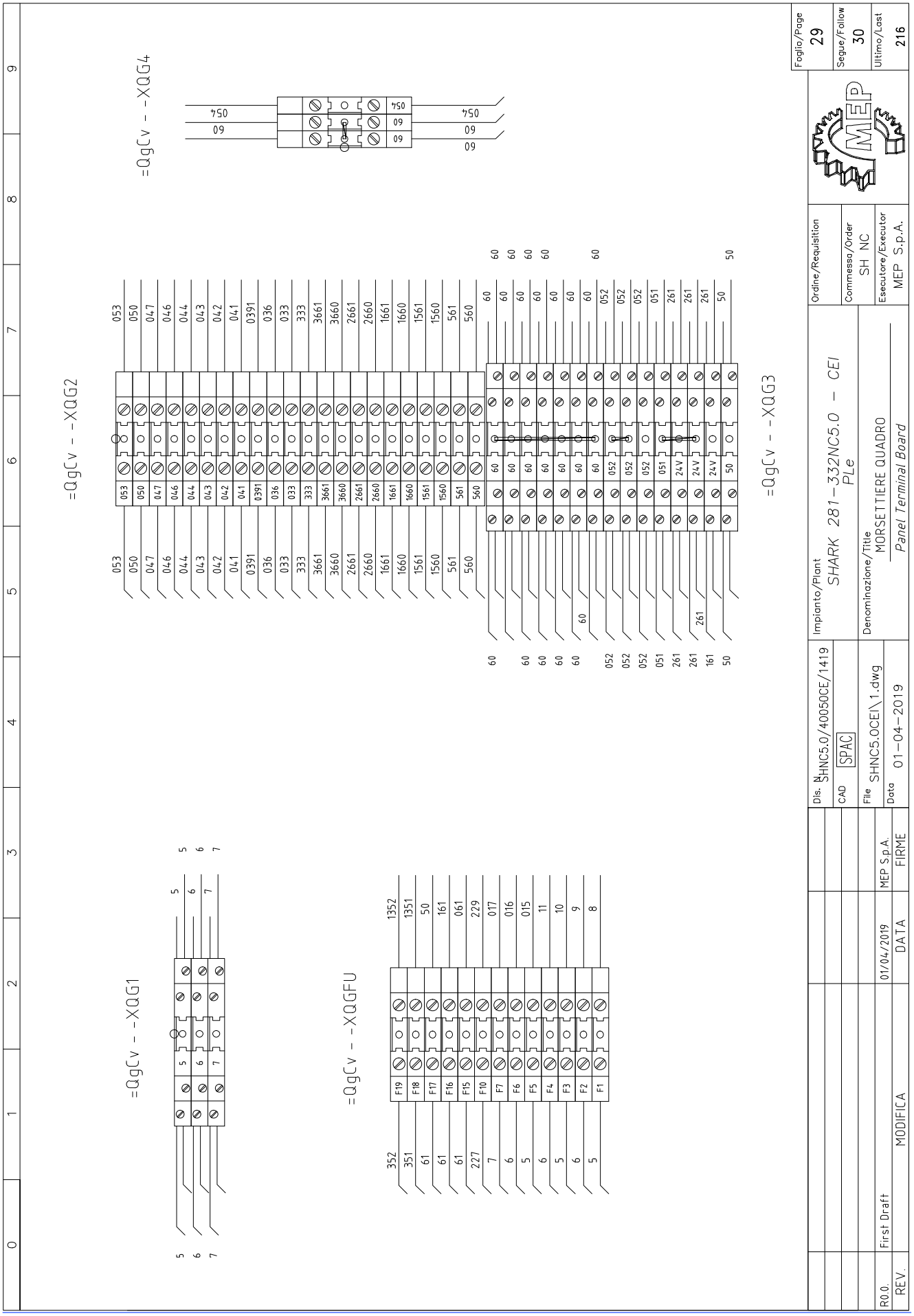

OPTIONAL
M1 ENCONDER
ENC
ENCODER ROTAZIONE TESTA
HEAD SWING ENCODER
14 bit assoluto SSI Gray
CK-
CK+
DT-
DT+
COMP
RST
0VDC
24VDC
B-XENC
A-XENC
D-XENC
C-XENC
F-XENC
H-XENC
I-XENC
J-XENC
8SH0.5
-WENC
Sch
YE
GN
BN
WH
PK
BK
BU
RD
CU1-CN9
17.0
ALIMENTAZIONE
POWER SUPPLY
24VCC
0VCC
CLOCK+
CLOCK-
DATA+
DATA-
SHIELD
ALLARM
CN9
E0
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Ordine/Requisition
Commessa/Order SH NC
Esecutore/Executor MEP S.p.A.
Impianto/Plant SHARK 281-332NC5.0 - CEI PLe
Denominazione/Title ENCODER TESTA MEP50
Head Encoder MEP50
Dis. N°HNC5.0/40050CE/1419
CAD SPAC
File SHNC5.OCEI\1.dwg
Data 01-04-2019
MEP S.p.A.
FIRME
01/04/2019
DATA
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MODIFICA
R0.0.
REV.

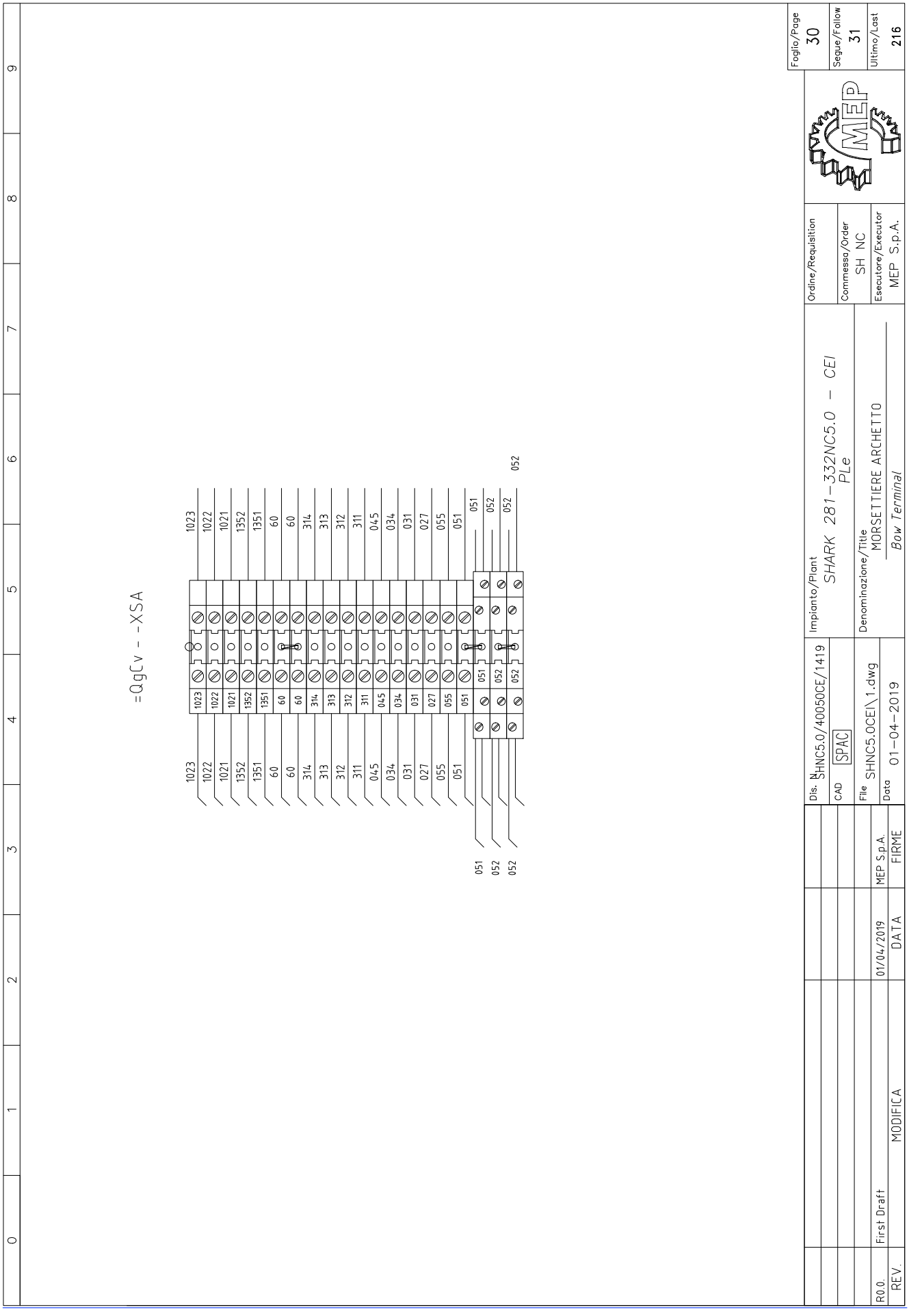


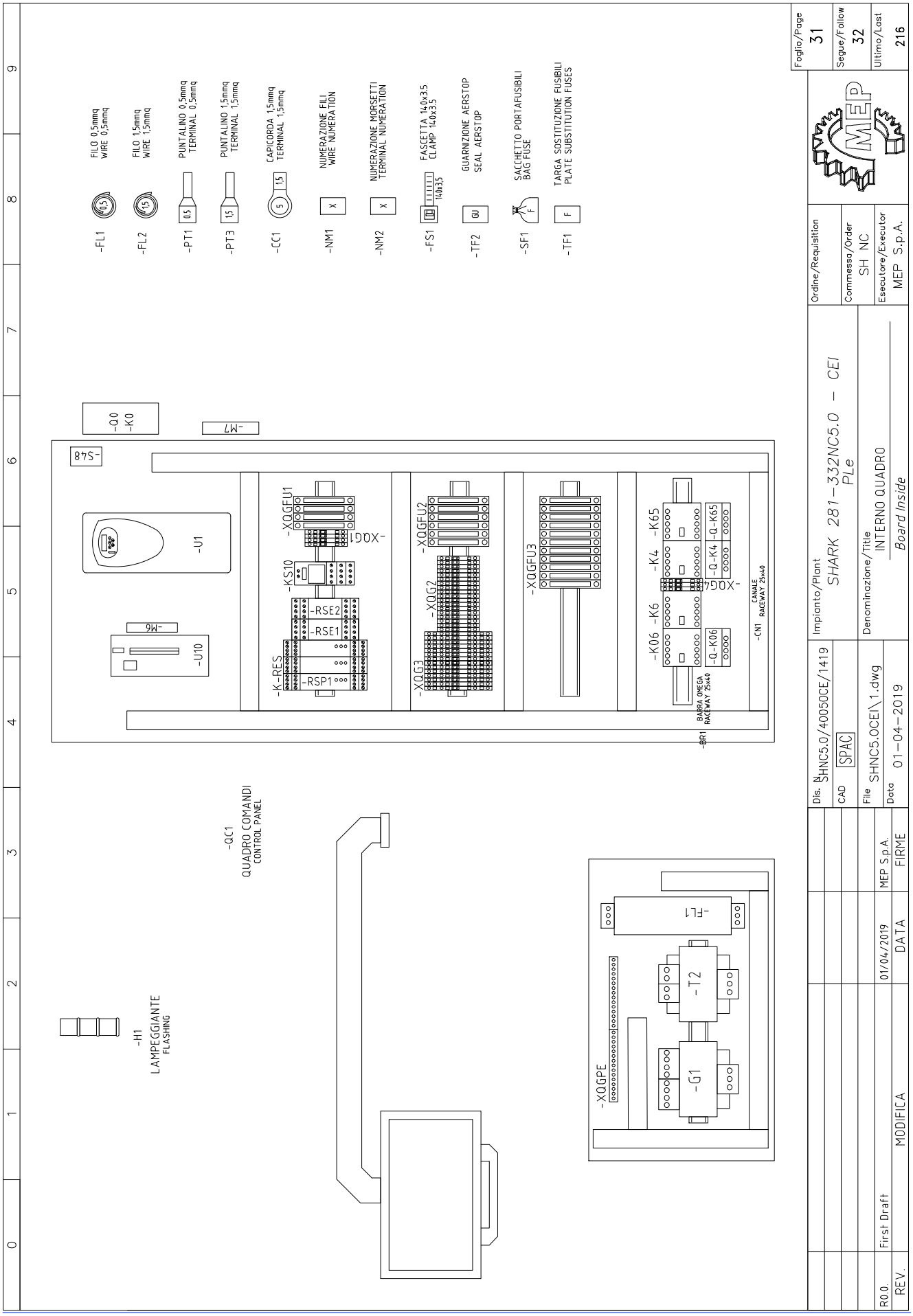
OPTIONAL PEDALIERA
OPTIONAL PEDALS

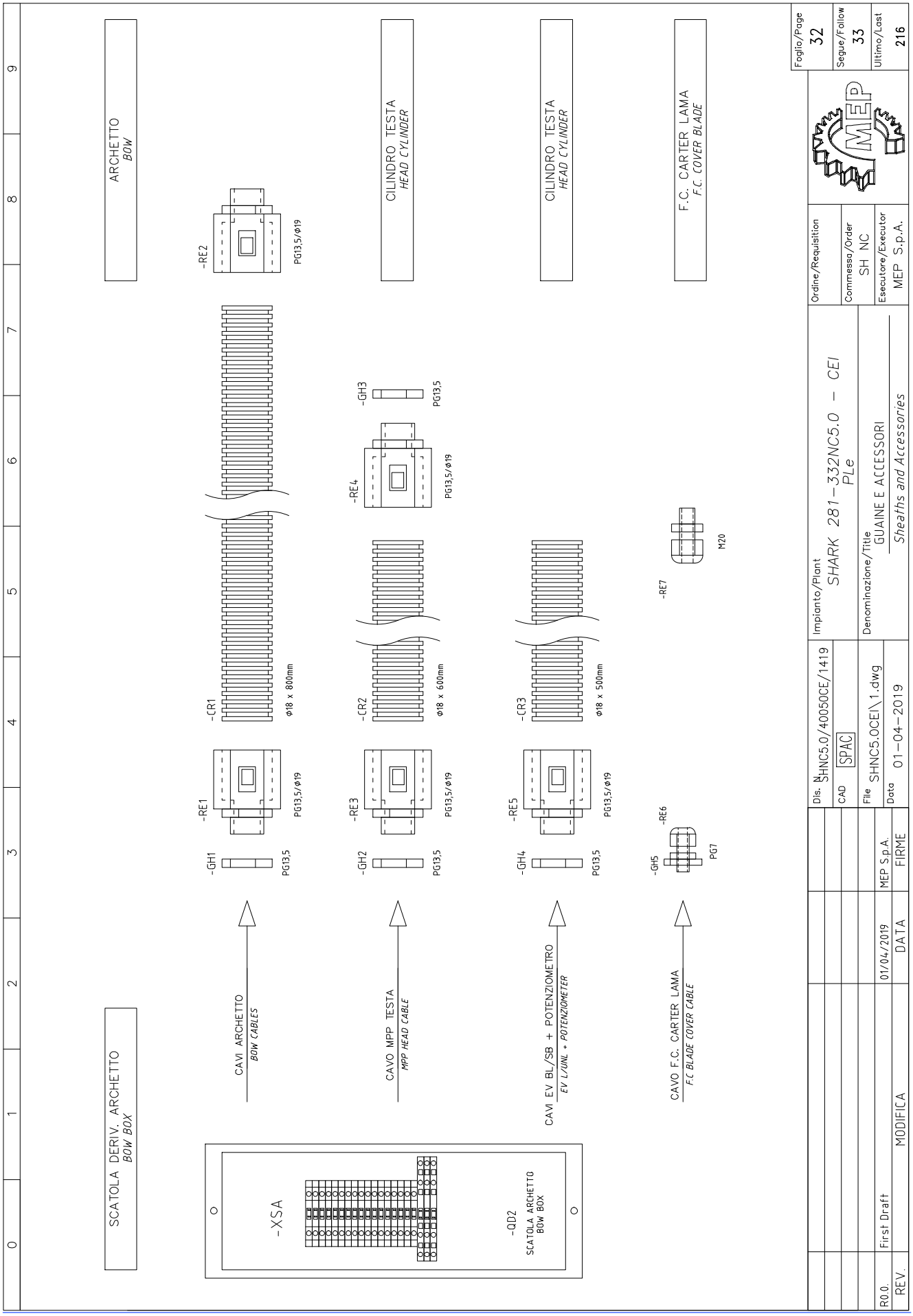
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OPTIONAL MICRO-LUBRIFICATION

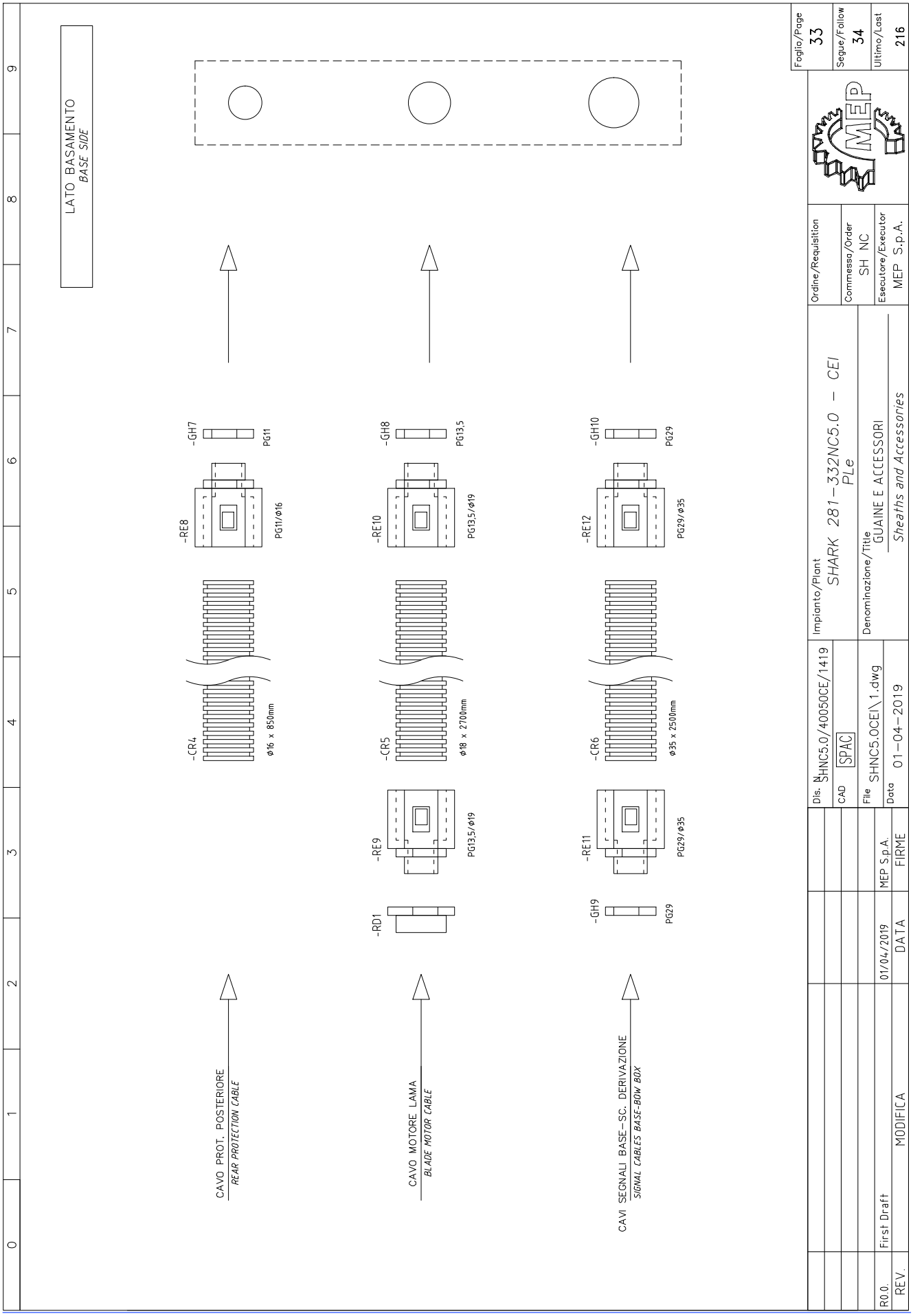
				Dis. N SHNC5.0/40050CE/1419	Impianto/Plant SHARK 281-332NC5.0 - CEI PLe	Ordine/Requisition		Foglio/Page 28
				CAD SPAC		Commessa/Order SH NC		Segue/Follow 29
				File SHNC5.0CEI\1.dwg	Denominazione/Title OPTIONAL	Esecutore/Executor MEP S.p.A.		Ultimo/Last 216
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REV.	MODIFICA	DATA	FIRME					

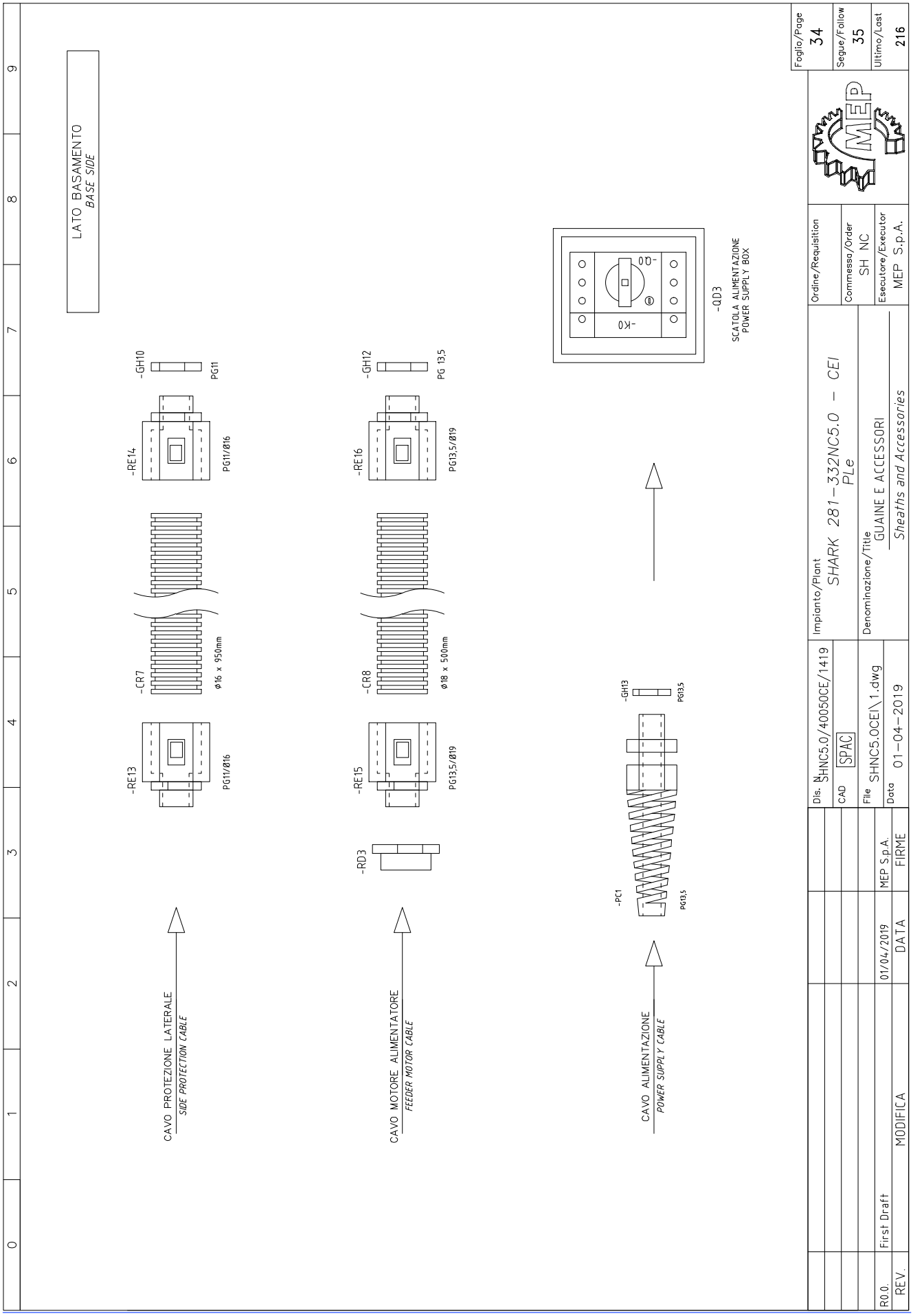

=QgCv - -XQG1
=QgCv - -XQG2
=QgCv - -XQG3
=QgCv - -XQG4
=QgCv - -XQGFU
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Ordine/Requisition
Commessa/Order SH NC
Esecutore/Executor MEP S.p.A.
Impianto/Plant SHARK 281-332NC5.0 - CEI PLe
Denominazione/Title MORSETTIERE QUADRO
Panel Terminal Board
Dis. SHNC5.0/40050CE/1419
CAD SPAC
File SHNC5.OCEI\1.dwg
Data 01-04-2019
MEP S.p.A.
FIRME
01/04/2019
DATA
First Draft
MODIFICA
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R0.0.

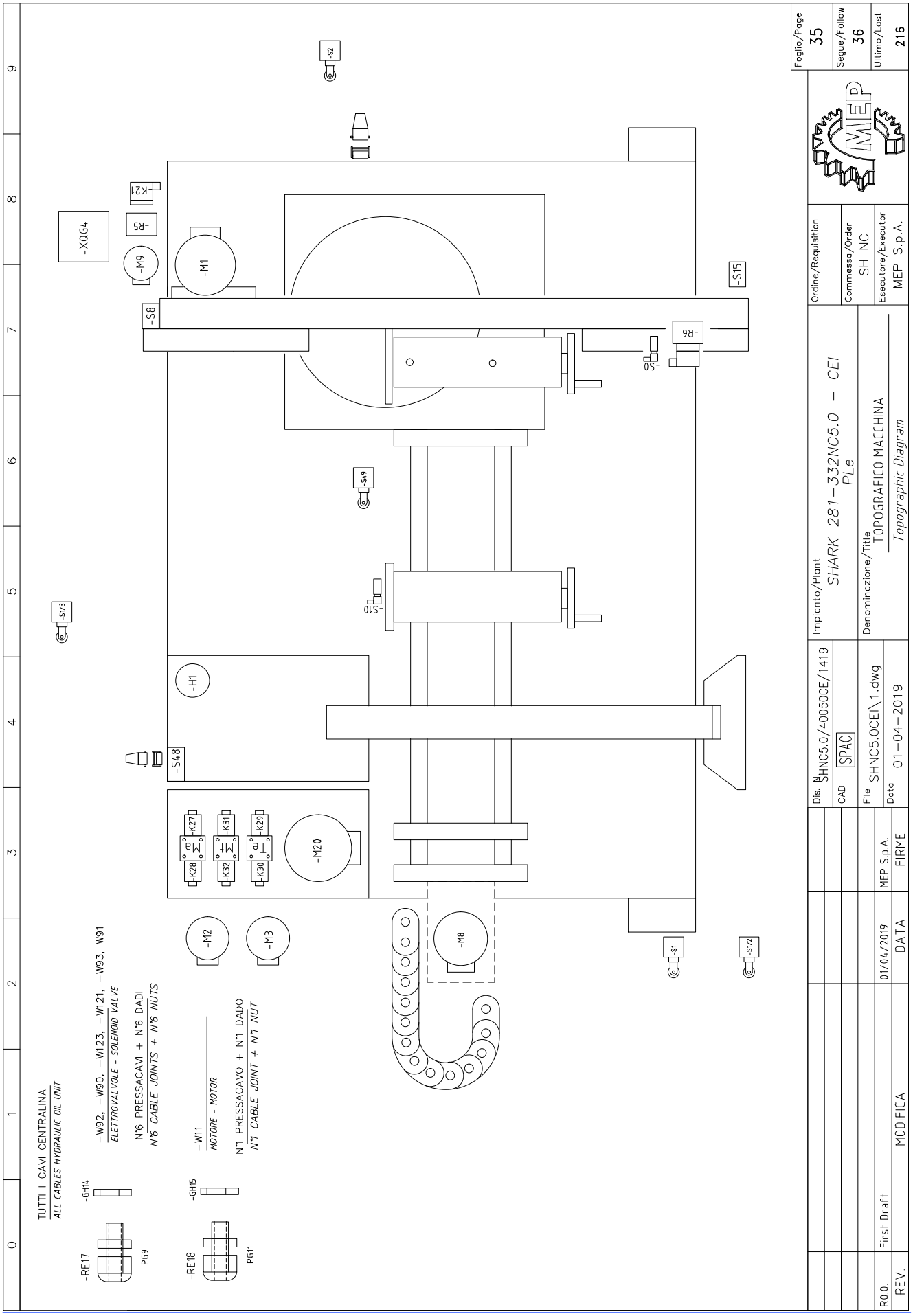

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1023
1022
1021
1352
1351
60
60
314
313
312
311
045
034
031
027
055
051
052
052
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Ordine/Requisition
Commessa/Order SH NC
Esecutore/Executor MEP S.p.A.
Impianto/Plant SHARK 281-332NC5.0 - CEI PLe
Denominazione/Title MORSETTIERE ARCHETTO
Bow Terminal
Dis. SHNC5.0/400500E/1419
CAD SPAC
File SHNC5.0CEI\1.dwg
Data 01-04-2019
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-FL1 FILO 0,5mmq WIRE 0,5mmq
-FL2 FILO 1,5mmq WIRE 1,5mmq
-PT1 PUNTALINO 0,5mmq TERMINAL 0,5mmq
-PT3 PUNTALINO 1,5mmq TERMINAL 1,5mmq
-CC1 CAPICORDA 1,5mmq TERMINAL 1,5mmq
-NM1 NUMERAZIONE FILI WIRE NUMERATION
-NM2 NUMERAZIONE MORSETTI TERMINAL NUMERATION
-FS1 FASCETTA 140x3,5 CLAMP 140x3,5
-TF2 GUARNIZIONE AERSTOP SEAL AERSTOP
-SF1 SACCHETTO PORTAFUSIBILI BAG FUSE
-TF1 TARGA SOSTITUZIONE FUSIBILI PLATE SUBSTITUTION FUSES
-Q0 -K0
-M7
-S48
-U1
-M6
-U10
-XQGFU1
-KS10
-RSE2
-RSE1
-RSP1
-K-RES
-XQG2
-XQGFU2
-XQG3
-XQGFU3
-K06 -K6
-K4 -K65
-Q-K06
-Q-K4 -Q-K65
-XQGX1
-XQGX2
-BR1 BARRA OMEGA RACEWAY 25x40
-CN1 CANALE RACEWAY 25x40
-H1 LAMPEGGIANTE FLASHING
-QC1 QUADRO COMANDI CONTROL PANEL
-XQGPE
-G1
-T2
-T1
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Ordine/Requisition
Commessa/Order SH NC
Esecutore/Executor MEP S.p.A.
Impianto/Plant SHARK 281-332NC5.0 - CEI PLe
Denominazione/Title INTERNO QUADRO
Board Inside
Dis. SHNC5.0/40050CE/1419
CAD SPAC
File SHNC5.OCE\1.dwg
Data 01-04-2019
REV. MODIFICA DATA FIRME
R0.0. First Draft 01/04/2019 MEP S.p.A.


ARCHETTO
BOW
CILINDRO TESTA
HEAD CYLINDER
CILINDRO TESTA
HEAD CYLINDER
F.C. CARTER LAMA
F.C. COVER BLADE
SCATOLA DERIV. ARCHETTO
BOW BOX
-XSA
-QD2
SCATOLA ARCHETTO
BOW BOX
-RE1
-RE2
-RE3
-RE4
-RE5
-RE6
-RE7
-CR1
-CR2
-CR3
-GH1
-GH2
-GH3
-GH4
-GH5
Ø18 x 800mm
Ø18 x 600mm
Ø18 x 500mm
PG13,5/Ø19
PG13,5
PG7
M20
CAVI ARCHETTO
BOW CABLES
CAVO MPP TESTA
MPP HEAD CABLE
CAVI EV BL/SB + POTENZIOMETRO
EV L/UNL + POTENZIOMETER
CAVO F.C. CARTER LAMA
F.C BLADE COVER CABLE
Dis. SHNC5.0/400500E/1419
CAD SPAC
File SHNC5.0CEI\1.dwg
Data 01-04-2019
Impianto/Plant
SHARK 281-332NC5.0 - CEI PLe
Denominazione/Title
GUAINE E ACCESSORI
Sheaths and Accessories
Ordine/Requisition
Commessa/Order
SH NC
Esecutore/Executor
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LATO BASAMENTO
BASE SIDE
-GH7
PG11
-RE8
PG11/ø16
-CR4
ø16 x 850mm
-GH8
PG13,5
-RE10
PG13,5/ø19
-CR5
ø18 x 2700mm
-GH10
PG29
-RE12
PG29/ø35
-CR6
ø35 x 2500mm
-RE9
PG13,5/ø19
-RD1
-RE11
PG29/ø35
-GH9
PG29
CAVO PROT. POSTERIORE
REAR PROTECTION CABLE
CAVO MOTORE LAMA
BLADE MOTOR CABLE
CAVI SEGNALI BASE-SC. DERIVAZIONE
SIGNAL CABLES BASE-BOW BOX
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Ordine/Requisition
Commessa/Order SH NC
Esecutore/Executor MEP S.p.A.
Impianto/Plant SHARK 281-332NC5.0 - CEI PLe
Denominazione/Title GUAINE E ACCESSORI
Sheaths and Accessories
Dis. SHNC5.0/40050CE/1419
CAD SPAC
File SHNC5.OCEI\1.dwg
Data 01-04-2019
R0.0. First Draft 01/04/2019 MEP S.p.A.
REV. MODIFICA DATA FIRME


LATO BASAMENTO
BASE SIDE
-GH10
PG11
-RE14
PG11/Ø16
-CR7
Ø16 x 950mm
-RE13
PG11/Ø16
CAVO PROTEZIONE LATERALE
SIDE PROTECTION CABLE
-GH12
PG 13,5
-RE16
PG13,5/Ø19
-CR8
Ø18 x 500mm
-RE15
PG13,5/Ø19
-RD3
CAVO MOTORE ALIMENTATORE
FEEDER MOTOR CABLE
-GH13
PG13,5
-PC1
PG13,5
CAVO ALIMENTAZIONE
POWER SUPPLY CABLE
-QD3
SCATOLA ALIMENTAZIONE
POWER SUPPLY BOX
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Ordine/Requisition
Commessa/Order SH NC
Esecutore/Executor MEP S.p.A.
Impianto/Plant SHARK 281-332NC5.0 - CEI PLe
Denominazione/Title GUAINE E ACCESSORI
Sheaths and Accessories
Dis. NSHNC5.0/400500E/1419
CAD SPAC
File SHNC5.0CEI\1.dwg
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FIRME
DATA
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MODIFICA


TUTTI I CAVI CENTRALINA
ALL CABLES HYDRAULIC OIL UNIT
-W92, -W90, -W123, -W121, -W93, W91
ELETTROVALVOLE - SOLENOID VALVE
N°6 PRESSACAVI + N°6 DADI
N°6 CABLE JOINTS + N°6 NUTS
-W11
MOTORE - MOTOR
N°1 PRESSACAVO + N°1 DADO
N°1 CABLE JOINT + N°1 NUT
-RE17
PG9
-RE18
PG11
-GH14
-GH15
-XQG4
-M1
-M2
-M3
-M8
-M9
-M20
-H1
-S1
-S2
-S4
-S5
-S6
-S8
-S10
-S12
-S13
-S15
-S48
-S49
-K1
-K2
-K27
-K28
-K29
-K30
-K31
-K32
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Ordine/Requisition
Commessa/Order SH NC
Esecutore/Executor MEP S.p.A.
Impianto/Plant SHARK 281-332NC5.0 - CEI PLe
Denominazione/Title TOPOGRAFICO MACCHINA
Topographic Diagram
Dis. SHNC5.0/40050CE/1419
CAD SPAC
File SHNC5.0CEI\1.dwg
Data 01-04-2019
MEP S.p.A.
FIRME
01/04/2019
DATA
R0.0. First Draft
REV. MODIFICA

CAVI ESTERNI \ EXTERNAL CABLES

QUADRO \ BOARD								DESTINAZIONE \ LOCATION			
QUADRO BOARD	FOGLIO SHEET	NR. MORSETTO TERMINAL NO.	NR. FILO CONDUCTOR NO.	ID SUL CAVO ID IN CABLE	CAVO CABLE	LUNGHEZZA LENGHT [mt]	DISTURBO NOISE LEVEL	ID SUL CAVO ID IN CABLE	NR. FILO CONDUCTOR NO.	NR. MORSETTO TERMINAL NO.	FOGLIO SHEET	QUADRO BOARD
			061	BN				BN	061			
=QgCv -F15	8/2		60	BU	-W01 dc 022.0160	2,00Mt		BU	60	CN7	26/1	=QgCv 24VCC
=QgCv -XQG3	10/1	6_1 ○			Cavo Alimentazione 24 Vdc					CN7	26/1	=QgCv 0VCC
			L1	BN				BN	L1			
=QgCv -AL	5/1	L1 ○	L2	BK				BK	L2	1	5/3	=QgCv -Q0
=QgCv -AL	5/1	L2 ○	N	BU	-W1 022.0158	4,00Mt		BU	N	3	5/3	=QgCv -Q0
=QgCv -AL	5/1	N ○	L3	GY	Cavo Alimentazione			GY	L3	○ N	5/2	=QgCv -X
=QgCv -AL	5/1	L3 ○	PE	GNYE				GNYE	PE	5	5/3	=QgCv -Q0
=QgCv -AL	5/2	PE ○								○ 1_1	5/2	=QgCv -XQGPE
			018	BN				BN	018			
=CiMep -M20	6/7	U	019	BK				BK	019	2	6/7	=QgCv -Q-K65
=CiMep -M20	6/8	V	020	GY	-W11 022.0162	1,50Mt		GY	020	4	6/8	=QgCv -Q-K65
=CiMep -M20	6/8	W	PE	GNYE	Cavo Motore Centralina			GNYE	PE	6	6/8	=QgCv -Q-K65
=CiMep -M20	6/8	PE								○ 1_15	6/9	=QgCv -XQGPE
			041	BN				BN	041			
=QgCv -XQG2	21/2	8 ○	048	GY				GY	048	M4	21/2	=QgCv OUT08
=QgCv OUT04	20/6	M3	053	BU				BU	053	95	20/6	=QgCv -Q-K65
=QgCv -XQG2	20/1	1 ○	043	GN				GN	043	M2	20/1	=QgCv OUT01
=QgCv -XQG2	21/6	6 ○	054	RD				RD	054	M5	21/6	=QgCv OUT12
=QgCv -XQG4	20/3	4 ○	044	YE				YE	044	M2	20/3	OUT02
=QgCv -XQG2	21/7	5 ○	042	WH	-W117 022.0147	2,00Mt		WH	042	M5	21/7	=QgCv OUT13
=QgCv -XQG2	21/2	7 ○	050	PK	Cavo Uscite Digitale			PK	050	M4	21/2	=QgCv OUT09
=QgCv -XQG2	20/8	2 ○	049	BK				BK	049	M3	20/8	=QgCv OUT07
=QgCv OUT05	20/7	M3	055	VT				VT	055	95	20/7	=QgCv -Q-K4
=QgCv -XSA	20/7	16 ○	046	RD-BU				RD-BU	046	M3	20/7	=QgCv OUT06
=QgCv -XQG2	21/3	4 ○	047	GY-PK				GY-PK	047	M4	21/3	=QgCv OUT10
=QgCv -XQG2	21/4	3 ○		Sch				Sch		M4	21/4	=QgCv OUT11

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Dis. N. SHNC5.0/40050CE/1419
CAD SPAC
File SHNC5.0CEI\1.dwg
Data 01-04-2019

Impianto/Plant: SHARK 281-332NC5.0 - CEI PLe
Denominazione/Title: RIASSUNTIVO CAVI / Cable Summary

Ordine/Requisition:
Commessa/Order: SH NC
Esecutore/Executor: MEP S.p.A.

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CAVI ESTERNI \ EXTERNAL CABLES

QUADRO \ BOARD								DESTINAZIONE \ LOCATION			
QUADRO BOARD	FOGLIO SHEET	NR. MORSETTO TERMINAL NO.	NR. FILO CONDUCTOR NO.	ID SUL CAVO ID IN CABLE	CAVO CABLE	LUNGHEZZA LENGHT [mt]	DISTURBO NOISE LEVEL	ID SUL CAVO ID IN CABLE	NR. FILO CONDUCTOR NO.	NR. MORSETTO TERMINAL NO.	FOGLIO SHEET	QUADRO BOARD
=QgCv -XQG2	19/4	12	333	BN				BN	333	M18	19/4	=QgCv IN11
				GY				GY				
=QgCv -XQG3	19/4	11_1	60	BU				BU	60	M16	19/9	=QgCv 0VCC
				GN				GN				
=QgCv -XQG3	18/3	10_1	052	RD				RD	052	M14	18/0	=QgCv 24VCC
=QgCv OUT15	21/8	M5	352	YE				YE	352		21/8	=QgCv -F19
=QgCv -XQG2	19/4	9	0391	WH	-W118 022.0147	2,00Mt		WH	0391	M18	19/4	=QgCv IN10
=QgCv -XQG2	18/3	11	033	PK	Cavo Ingressi - Uscite			PK	033	M15	18/3	=QgCv IN01
=QgCv -XQG2	18/7	10	036	BK				BK	036	M15	18/7	=QgCv IN06
=QgCv OUT14	21/7	M5	351	VT				VT	351		21/7	=QgCv -F18
				RD-BU				RD-BU				
				GY-PK				GY-PK				
				Sch				Sch				
=QgCv -XQG2	12/1	21	561	BN				BN	561		12/1	=QgCv -S4
=QgCv -XQG2	12/1	22	560	GY				GY	560	2	12/1	=QgCv -S4
=QgCv -S4	12/1	1	271	BU				BU	271	CS MP308 M0	11/2	-RSP1
				GN				GN				
=QgCv -S4	12/1		272	RD				RD	272	CS MP308 M0	11/2	-RSP1
				YE				YE				
				WH	-W119 022.0147	2,00Mt		WH				
=QgCv 24VDC	20/3	M2	1261	PK	Cavo Giunzioni			PK	1261	CS ME-03VU24	11/5	-RSE1
				BK				BK				
=QgCv IN03	18/4	M15	0393	VT				VT	0393		14/1	
=QgCv IN05	18/6	M15	0392	RD-BU				RD-BU	0392		14/2	
=QgCv IN02	18/4	M15	02	GY-PK				GY-PK	02		14/1	
				Sch				Sch				
=QgCv -XSA	18/2	14	031	BN				BN	031	M15	18/2	=QgCv IN00
				GY				GY				
=QgCv -XSA	18/2	18_1	60	BU				BU	60	M16	18/9	=QgCv 0VCC
=QgCv -XSA	18/7	13	034	GN				GN	034	M15	18/7	=QgCv IN07
=QgCv -XSA	18/1	20_1	052	RD	-W119/1 022.0159	5,00Mt		RD	052	M14	18/1	=QgCv 24VCC
				YE	Cavo Giunzioni			YE				
				WH				WH				
			045	PK				PK	045			
=QgCv -XSA	20/4	12								M2	20/4	=QgCv OUT03

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Dis. N. SHNC5.0/40050CE/1419
CAD SPAC
File SHNC5.0CEI\1.dwg
Data 01-04-2019

Impianto/Plant: SHARK 281-332NC5.0 - CEI PLe
Denominazione/Title: RIASSUNTIVO CAVI
Cable Summary

Ordine/Requisition:
Commessa/Order: SH NC
Esecutore/Executor: MEP S.p.A.

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Translation of the original instructions

CAVI ESTERNI \ EXTERNAL CABLES

QUADRO \ BOARD								DESTINAZIONE \ LOCATION			
QUADRO BOARD	FOGLIO SHEET	NR. MORSETTO TERMINAL NO.	NR. FILO CONDUCTOR NO.	ID SUL CAVO ID IN CABLE	CAVO CABLE	LUNGHEZZA LENGHT [mt]	DISTURBO NOISE LEVEL	ID SUL CAVO ID IN CABLE	NR. FILO CONDUCTOR NO.	NR. MORSETTO TERMINAL NO.	FOGLIO SHEET	QUADRO BOARD
			115	BN				BN	115			
=QgCv	15/1	2	553	BU				BU	553			
=QgCv	15/2	9	116	GN				GN	116			
=QgCv	15/1	1		GY				GY				
				YE	-W120/1 022.3301	2,40Mt		YE				
			117	WH	Cavo Aux Inverter			WH	117			
=QgCv	15/2	7	038	PK				PK	038			
=QgCv	15/3		57	RD				RD	57			
=QgCv	15/2	12	PE	Sch				Sch	PE			
=QgCv -XQGPE	15/4	1_11 O										
			052	BN				BN	052	O 2	19/5	=ElMep -XGIU
=QgCv -XQG3	19/4	9_1 O	333	BU	-W121/1 022.0160	1,50Mt		BU	333	O 1	19/4	=ElMep -XGIU
=QgCv -XQG2	19/4	12 O			Cavo FC Zero Alimentatore.							
			052	BN				BN	052			
=QgCv -XQG3	18/7	8_1 O	036	BU	-W122 022.0160	1,80Mt		BU	036			
=QgCv -XQG2	18/7	10 O			Cavo Livello olio							
			043	BN				BN	043	2	21/6	=QgCv -X012
=QgCv -XQG2	21/6	6 O	60	BU	-W123 022.0160	1,50Mt		BU	60	1	21/6	=QgCv -X012
=QgCv -XQG3	21/3	3_1 O			Cavo Ev. Salita Testa							
			044	BN				BN	044	1	21/7	=QgCv -X014
=QgCv -XQG2	21/7	5 O	60	BU	-W124 022.0160	1,50Mt		BU	60	2	21/7	=QgCv -X014
=QgCv -XQG3	21/6	4_1 O			Cavo Ev. Discesa Testa							
			052	BN				BN	052	3	19/8	-SJ1
=QgCv -XSA	23/8	19_1 O	027	YE				YE	027	M27	23/8	=QgCv AI4a
=QgCv -XSA	23/8	15 O	051	WH	-W20 022.0141	5,00Mt		WH	051	M27	23/7	=QgCv 0V
=QgCv -XSA	23/7	17 O	PE	GN	Cavo Tensione Lama			GN	PE	O 1_8	23/7	=QgCv -XQGPE
=QgCv -XSAPE	23/7	2 O	PE	Sch				Sch	PE			
=QgCv -XSAPE	23/7	2 O										
			052	BN				BN	052	O 19_1	23/8	=QgCv -XSA
=ElMep -XS7	23/7	1 C	027	YE				YE	027	O 15	23/8	=QgCv -XSA
=ElMep -XS7	23/8	2 C	051	WH	-W20/1 022.0141	2,00Mt		WH	051	O 17	23/7	=QgCv -XSA
=ElMep -XS7	23/7	3 C	PE	GN	Cavo Tensione Lama			GN	PE	O 2	23/7	=QgCv -XSAPE
=ElMep -XS7	23/7	PE C	PE	Sch				Sch	PE	O 2	23/7	=QgCv -XSAPE
=ElMep -XS7	23/7	PE C										

REV.	MODIFICA	DATA	FIRME
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Dis. N. SHNC5.0/40050CE/1419
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Data 01-04-2019

Impianto/Plant: *SHARK 281-332NC5.0 - CEI PLe*
Denominazione/Title: RIASSUNTIVO CAVI
Cable Summary

Ordine/Requisition:
Commessa/Order: SH NC
Esecutore/Executor: MEP S.p.A.

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CAVI ESTERNI \ EXTERNAL CABLES

QUADRO \ BOARD								DESTINAZIONE \ LOCATION			
QUADRO BOARD	FOGLIO SHEET	NR. MORSETTO TERMINAL NO.	NR. FILO CONDUCTOR NO.	ID SUL CAVO ID IN CABLE	CAVO CABLE	LUNGHEZZA LENGHT [mt]	DISTURBO NOISE LEVEL	ID SUL CAVO ID IN CABLE	NR. FILO CONDUCTOR NO.	NR. MORSETTO TERMINAL NO.	FOGLIO SHEET	QUADRO BOARD
=QgCv +VRf	22/1	M11	023	BN				BN	023	⊂— 1	22/2	=ElMep -XR5
=QgCv AI0	22/3	M11	024	YE				YE	024	⊂— 2	22/2	=ElMep -XR5
=QgCv 0V	22/2	M11	025	WH	-W21 022.0141	5,00Mt		WH	025	⊂— 3	22/2	=ElMep -XR5
=QgCv Sh	22/4	M11	PE	GN	Cavo Potenziometro Testa			GN	PE	⊂— 4	22/3	=ElMep -XR5
=QgCv -XQGPE	22/4	1_3 ○	PE	Sch				Sch	PE	⊂— 4	22/3	=ElMep -XR5
=ElMep -SQ0	18/2	1	052	BN				BN	052	○ 20_1	18/1	=QgCv -XSA
=ElMep -SQ0	18/2	4	031	BK	-W27 022.0376	1,50Mt		BK	031	○ 14	18/2	=QgCv -XSA
=ElMep -SQ0	18/2	3	60	BU	Cavo Proximity Lama			BU	60	○ 18_1	18/2	=QgCv -XSA
=QgCv -XSA	24/2	11 ○	311	BN				BN	311	M6	24/3	=QgCv A+
=QgCv -XSA	24/1	9 ○	313	YE				YE	313	M6	24/2	=QgCv B-
=QgCv -XSA	24/2	10 ○	312	WH	-W28 022.0141	5,00Mt		WH	312	M6	24/3	=QgCv A-
=QgCv -XSA	24/1	8 ○	314	GN	Cavo Stepper Discesa Testa			GN	314	M6	24/1	=QgCv B+
=QgCv SCH	24/1	M6	Sch	Sch				Sch	Sch			
=QgCv -U10	9/3	A1	221	BN				BN	221	BIA/GIA	9/4	=ElMep -M8
=QgCv -U10	9/3	A1	222	BK				BK	222	GIALLO	9/4	=ElMep -M8
=QgCv -U10	9/3	B2	224	BU	-W29 022.0158	1,60Mt		BU	224	BIA/ARA	9/5	=ElMep -M8
=QgCv -U10	9/3	B1	223	GY	Cavo Stepper Alimentatore			GY	223	ARANCIO	9/5	=ElMep -M8
=QgCv -XQGPE	9/3	1_5 ○	PE	GNYE				GNYE	PE		9/5	=ElMep -M8
=QgCv ST+	24/8	M8	0314	BN				BN	0314	14	16/2	=QgCv
=QgCv DR+	24/7	M8	0315	YE				YE	0315	15	16/2	=QgCv
=QgCv SCH	24/5	M8	0320	WH	-W29/1 022.0141	2,20Mt		WH	0320			
				GN	Cavo Stepper Alimentatore Sch			GN				
=QgCv SCH	24/5	M8	0320	Sch				Sch	0320			
=QgCv -XQG3	20/5	13_2 ○	261	BN	-W30 022.0160	3,50Mt		BN	261	4	20/5	=QgCv -S23
=EvTr -K6	20/5	22	1055	BU	Cavo Inversione EVTR			BU	1055	3	20/5	=QgCv -S23

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Impianto/Plant: SHARK 281-332NC5.0 - CEI PLe
Denominazione/Title: RIASSUNTIVO CAVI
Cable Summary

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Translation of the original instructions

CAVI ESTERNI \ EXTERNAL CABLES

QUADRO \ BOARD								DESTINAZIONE \ LOCATION			
QUADRO BOARD	FOGLIO SHEET	NR. MORSETTO TERMINAL NO.	NR. FILO CONDUCTOR NO.	ID SUL CAVO ID IN CABLE	CAVO CABLE	LUNGHEZZA LENGHT [mt]	DISTURBO NOISE LEVEL	ID SUL CAVO ID IN CABLE	NR. FILO CONDUCTOR NO.	NR. MORSETTO TERMINAL NO.	FOGLIO SHEET	QUADRO BOARD
=QgCv -XQG2	12/1	21	561	BN				BN	561			
=QgCv -XQG2	12/2	19	1561	YE	-W35 022.0141	4,00Mt		YE	1561			
=QgCv -XQG2	12/1	22	560	WH	Cavo Pedaliera Emergenza			WH	560			
				Sch				Sch				
=QgCv -XQG3	18/3	10_1	052	BN	-W36 022.0160	4.00Mt		BN	052			
=Pe -S13	18/3	4	033	BU	Cavo Avvio da Pedaliera			BU	033	11	18/3	=QgCv -XQG2
=QgCv -XQG2	20/1	1	053	BN	-W37 022.0160	1,00Mt		BN	053	1	20/1	=QgCv -H1
=QgCv -XQG3	20/2	7_1	60	BU	Cavo Lampeggiante			BU	60	10	20/1	=QgCv -H1
=QgCv -XSA	20/4	12	045	BN	-W39 022.0160	0,50Mt		BN	045	1	20/4	=QgCv -X003
=QgCv -XSA	20/3	7	60	BU	Cavo Ev. Sblocco Testa			BU	60	2	20/3	=QgCv -X003
=ElMep -M2	6/4	U	015	BN				BN	015	2	6/4	=QgCv -Q-K4
=ElMep -M2	6/4	V	016	BK	-W4 022.0162	1,50Mt		BK	016	4	6/4	=QgCv -Q-K4
=ElMep -M2	6/4	W	017	GY	Cavo Pompa Acqua			GY	017	6	6/4	=QgCv -Q-K4
=ElMep -M2	6/4	PE	PE	GNYE				GNYE	PE	1_17	6/5	=QgCv -XQGPE
=ElMep -M3	6/6	U	015	BN				BN	015	2	6/4	=QgCv -Q-K4
=ElMep -M3	6/6	V	016	BK	-W5 022.0162	1,50Mt		BK	016	4	6/4	=QgCv -Q-K4
=ElMep -M3	6/6	W	017	GY	Cavo Pompa Acqua			GY	017	6	6/4	=QgCv -Q-K4
=ElMep -M3	6/6	PE	PE	GNYE				GNYE	PE	1_19	6/7	=QgCv -XQGPE
=QgCv -XSA	21/7	5	1351	BN				BN	1351		21/7	=QgCv -F18
=QgCv -XSA	21/8	4	1352	YE				YE	1352		21/8	=QgCv -F19
=QgCv -XSA	21/8	6	60	WH	-W500 022.0141	3.50Mt		WH	60	4_1	21/6	=QgCv -XQG3
				GN	Cavo Lamp + Laser			GN				
				Sch				Sch				
=ElMep -S15	18/7	3	052	BN	-W52 022.0160	2,00Mt		BN	052	20_2	18/8	=QgCv -XSA
=ElMep -S15	18/7	4	034	BU	Cavo Mircroswitch			BU	034	13	18/7	=QgCv -XSA

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Impianto/Plant: SHARK 281-332NC5.0 - CEI PLe
Denominazione/Title: RIASSUNTIVO CAVI
Cable Summary

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Esecutore/Executor: MEP S.p.A.

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CAVI ESTERNI \ EXTERNAL CABLES

QUADRO \ BOARD								DESTINAZIONE \ LOCATION			
QUADRO BOARD	FOGLIO SHEET	NR. MORSETTO TERMINAL NO.	NR. FILO CONDUCTOR NO.	ID SUL CAVO ID IN CABLE	CAVO CABLE	LUNGHEZZA LENGHT [mt]	DISTURBO NOISE LEVEL	ID SUL CAVO ID IN CABLE	NR. FILO CONDUCTOR NO.	NR. MORSETTO TERMINAL NO.	FOGLIO SHEET	QUADRO BOARD
=QgCv -XQG3	19/4	9_1	052	BN				BN	052			
=ElMep -S10	19/4	4	0391	BK	-W59 022.0376	2,80Mt		BK	0391	9	19/4	=QgCv -XQG2
=ElMep -S10	19/4	3	60	BU	Cavo FC Barra Alimentatore			BU	60	11_1	19/4	=QgCv -XQG3
=QgCv -XSA	7/5	3	1021	BN				BN	1021	2	7/5	=SpPl -Q-K5
=QgCv -XSA	7/5	2	1022	BK	-W6 022.0162	2,00Mt		BK	1022	4	7/5	=SpPl -Q-K5
=QgCv -XSA	7/5	1	1023	GY	Cavo Motore Spazzola Pulilama			GY	1023	6	7/5	=SpPl -Q-K5
=QgCv -XSAPE	7/6	1	PE	GNYE				GNYE	PE	1_4	7/6	=QgCv -XQGPE
=SpPl -M4	7/5	U	1021	BN				BN	1021	3	7/5	=QgCv -XSA
=SpPl -M4	7/5	V	1022	BK	-W6/C 022.0162	0,7Mt		BK	1022	2	7/5	=QgCv -XSA
=SpPl -M4	7/5	W	1023	GY	Cavo Motore Spazzola Pulilama			GY	1023	1	7/5	=QgCv -XSA
=SpPl -M4	7/6	PE	PE	GNYE				GNYE	PE	1	7/6	=QgCv -XSAPE
=EvTr -X-CK03	7/1	1	1024	BN				BN	1024	2	7/1	=EvTr -Q-K06
=EvTr -X-CK03	7/1	2	1025	BK	-W7 022.0162	2,00Mt		BK	1025	4	7/1	=EvTr -Q-K06
=EvTr -X-CK03	7/1	3	1026	GY	Cavo EVTR			GY	1026	6	7/1	=EvTr -Q-K06
=EvTr -X-CK03	7/1	4	PE	GNYE				GNYE	PE	1_13	7/2	=QgCv -XQGPE
=EvTr -X-CK03M	7/1	1	1024	BN				BN	1024	U	7/1	=EvTr -M5
=EvTr -X-CK03M	7/1	2	1025	BK	-W7/1 022.0162	1,20Mt		BK	1025	V	7/1	=EvTr -M5
=EvTr -X-CK03M	7/1	3	1026	GY	Cavo EVTR			GY	1026	W	7/1	=EvTr -M5
=EvTr -X-CK03M	7/1	4	PE	GNYE				GNYE	PE	PE	7/1	=EvTr -M5
=QgCv -XQG2	20/8	2	050	BN	-W89 022.0160	1,80Mt		BN	050			
=QgCv -XQG3	20/8	7_2	60	BU	Cavo Ev. Lubrificazione Minimale			BU	60			
=QgCv -XQG2	21/2	7	042	BN	-W90 022.0160	1,50Mt		BN	042	1	21/2	=QgCv -X009
=QgCv -XQG3	21/2	2_1	60	BU	Cavo Ev. Ch. Morsa Taglio			BU	60	2	21/3	=QgCv -X009
=QgCv -XQG2	21/4	3	047	BN	-W91 022.0160	1,50Mt		BN	047	1	21/4	=QgCv -X011
=QgCv -XQG3	21/3	3_1	60	BU	Cavo Ev. Ch. Morsa Alimentatore			BU	60	2	21/4	=QgCv -X011

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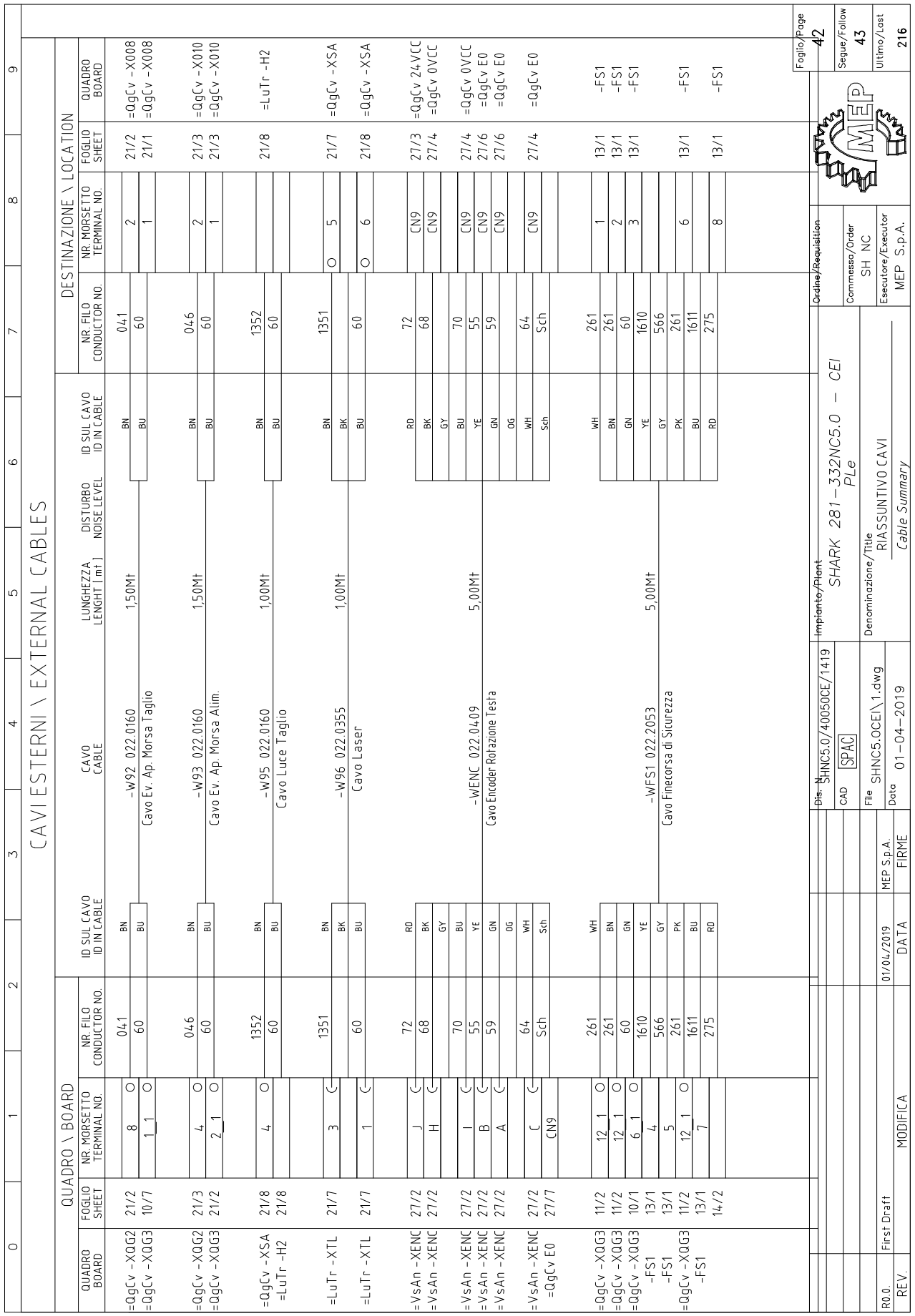
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Impianto/Plant: SHARK 281-332NC5.0 - CEI PLe
Denominazione/Title: RIASSUNTIVO CAVI / Cable Summary

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Esecutore/Executor: MEP S.p.A.

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CAVI ESTERNI \ EXTERNAL CABLES
QUADRO \ BOARD
DESTINAZIONE \ LOCATION
QUADRO BOARD
FOGLIO SHEET
NR. MORSETTO TERMINAL NO.
NR. FILO CONDUCTOR NO.
ID SUL CAVO ID IN CABLE
CAVO CABLE
LUNGHEZZA LENGHT [mt]
DISTURBO NOISE LEVEL
ID SUL CAVO ID IN CABLE
NR. FILO CONDUCTOR NO.
NR. MORSETTO TERMINAL NO.
FOGLIO SHEET
QUADRO BOARD
=QgCv -XQG2 21/2 8 041 BN -W92 022.0160 1,50Mt BN 041 2 21/2 =QgCv -X008
=QgCv -XQG3 10/7 1_1 60 BU Cavo Ev. Ap. Morsa Taglio BU 60 1 21/1 =QgCv -X008
=QgCv -XQG2 21/3 4 046 BN -W93 022.0160 1,50Mt BN 046 2 21/3 =QgCv -X010
=QgCv -XQG3 21/2 2_1 60 BU Cavo Ev. Ap. Morsa Alim. BU 60 1 21/3 =QgCv -X010
=QgCv -XSA 21/8 4 1352 BN -W95 022.0160 1,00Mt BN 1352 21/8 =LuTr -H2
=LuTr -H2 21/8 60 BU Cavo Luce Taglio BU 60
=LuTr -XTL 21/7 3 1351 BN -W96 022.0355 1,00Mt BN 1351 5 21/7 =QgCv -XSA
BK BK
=LuTr -XTL 21/7 1 60 BU Cavo Laser BU 60 6 21/8 =QgCv -XSA
=VsAn -XENC 27/2 J 72 RD RD 72 CN9 27/3 =QgCv 24VCC
=VsAn -XENC 27/2 H 68 BK BK 68 CN9 27/4 =QgCv 0VCC
GY GY
=VsAn -XENC 27/2 I 70 BU BU 70 CN9 27/4 =QgCv 0VCC
=VsAn -XENC 27/2 B 55 YE -WENC 022.0409 5,00Mt YE 55 CN9 27/6 =QgCv E0
=VsAn -XENC 27/2 A 59 GN Cavo Encoder Rotazione Testa GN 59 CN9 27/6 =QgCv E0
OG OG
=VsAn -XENC 27/2 C 64 WH WH 64 CN9 27/4 =QgCv E0
=QgCv E0 27/7 CN9 Sch Sch Sch
=QgCv -XQG3 11/2 12_1 261 WH WH 261 1 13/1 -FS1
=QgCv -XQG3 11/2 12_1 261 BN BN 261 2 13/1 -FS1
=QgCv -XQG3 10/1 6_1 60 GN GN 60 3 13/1 -FS1
-FS1 13/1 4 1610 YE -WFS1 022.2053 5,00Mt YE 1610
-FS1 13/1 5 566 GY Cavo Finecorsa di Sicurezza GY 566
=QgCv -XQG3 11/2 12_1 261 PK PK 261 6 13/1 -FS1
-FS1 13/1 7 1611 BU BU 1611 8 13/1 -FS1
14/2 275 RD RD 275
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CAVI ESTERNI \ EXTERNAL CABLES

QUADRO \ BOARD								DESTINAZIONE \ LOCATION			
QUADRO BOARD	FOGLIO SHEET	NR. MORSETTO TERMINAL NO.	NR. FILO CONDUCTOR NO.	ID SUL CAVO ID IN CABLE	CAVO CABLE	LUNGHEZZA LENGHT [mt]	DISTURBO NOISE LEVEL	ID SUL CAVO ID IN CABLE	NR. FILO CONDUCTOR NO.	NR. MORSETTO TERMINAL NO.	FOGLIO SHEET	QUADRO BOARD
=QgCv -XQG3	11/2	12_1	261	WH	-WFS2 022.2053 Cavo Finecorsa di Sicurezza	5,00Mt		WH	261	1	13/2	-FS2
=QgCv -XQG3	11/2	12_1	261	BN				BN	261	2	13/2	-FS2
=QgCv -XQG3	10/1	6_1	60	GN				GN	60	3	13/3	-FS2
-FS2	13/3	4	1620	YE				YE	1620			
-FS2	13/3	5	567	GY				GY	567			
=QgCv -XQG3	11/2	12_1	261	PK				PK	261	6	13/3	-FS2
-FS2	13/3		1621	BU				BU	1621			
				RD				RD				
=QgCv -XQG3	11/2	12_1	261	WH	-WFS3 022.2053 Cavo Finecorsa di Sicurezza	5,00Mt		WH	261	1	13/4	-FS3
=QgCv -XQG3	11/2	12_1	261	BN				BN	261	2	13/4	-FS3
=QgCv -XQG3	10/1	6_1	60	GN				GN	60	3	13/4	-FS3
-FS3	13/4	4	1630	YE				YE	1630			
-FS3	13/5	5	568	GY				GY	568			
=QgCv -XQG3	11/2	12_1	261	PK				PK	261	6	13/5	-FS3
-FS3	13/5		1631	BU				BU	1631			
				RD				RD				
=QgCv -XQG3	11/2	12_1	261	WH	-WFS4 022.2053 Cavo Finecorsa di Sicurezza	5,00Mt		WH	261	1	13/6	-FS4
=QgCv -XQG3	11/2	12_1	261	BN				BN	261	2	13/6	-FS4
=QgCv -XQG3	10/1	6_1	60	GN				GN	60	3	13/6	-FS4
-FS4	13/6	4	1640	YE				YE	1640			
-FS4	13/6	5	569	GY				GY	569			
=QgCv -XQG3	11/2	12_1	261	PK				PK	261	6	13/7	-FS4
-FS4	13/7		1641	BU				BU	1641			
				RD				RD				
=QgCv -XQG3	11/2	12_1	261	WH	-WFS5 022.2053 Cavo Finecorsa di Sicurezza	5,00Mt		WH	261	1	13/8	-FS5
=QgCv -XQG3	11/2	12_1	261	BN				BN	261	2	13/8	-FS5
=QgCv -XQG3	10/1	6_1	60	GN				GN	60	3	13/8	-FS5
-FS5	13/8	4	1650	YE				YE	1650			
-FS5	13/8	5	570	GY				GY	570			
=QgCv -XQG3	11/2	12_1	261	PK				PK	261	6	13/8	-FS5
-FS5	13/8		1651	BU				BU	1651			
				RD				RD				

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Impianto/Plant: SHARK 281-332NC5.0 - CEI PLe
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Nome/Item	Mep_code	Descrizione IT		Descrizione EN (Db)			Codice Interno	Fg/Sh	Quadro/Board	Q.ta/Q.ty
-FL1	022.2948	FILTRO EMC TRIFASE 520VAC 20A		Filter EMC Three-phases SHAFFNER 20A			FN3270H-20-44	5	=BmCv	1
-FS1	022.4008	sensore RFID ST DD420MK-D1T		D ST DD420MK-D1T			ST DD420MK-D1TPIZZATO	13	=BmMep	1
-FS2	022.4008	sensore RFID ST DD420MK-D1T		D ST DD420MK-D1T			ST DD420MK-D1TPIZZATO	13	=BmMep	1
-FS3	022.4008	sensore RFID ST DD420MK-D1T		D ST DD420MK-D1T			ST DD420MK-D1TPIZZATO	13	=BmMep	1
-FS4	022.4008	sensore RFID ST DD420MK-D1T		D ST DD420MK-D1T			ST DD420MK-D1TPIZZATO	13	=BmMep	1
-FS5	022.4008	sensore RFID ST DD420MK-D1T		D ST DD420MK-D1T			ST DD420MK-D1TPIZZATO	13	=BmMep	1
-K21	V.d.Id.	Vedi distinta idraulica		See hydraulic BOM			V.d.Id.	20	=CiCv	1
-K27		Elettrovalvola aperta (in chiusura) secondo solenoide						21	=CiCv	1
-K28	V.d.Id.	Vedi distinta idraulica		See hydraulic BOM			V.d.Id.	21	=CiCv	1
-K29		Elettrovalvola aperta (in chiusura) secondo solenoide						21	=CiCv	1
-K30	V.d.Id.	Vedi distinta idraulica		See hydraulic BOM			V.d.Id.	21	=CiCv	1
-K31		Elettrovalvola aperta (in chiusura) secondo solenoide						21	=CiCv	1
-K32	V.d.Id.	Vedi distinta idraulica		See hydraulic BOM			V.d.Id.	21	=CiCv	1
-M1	019.3621	Motore KW2.2 1390Rpm		Motor KW2.2 1390Rpm			M90L4P.B14 V.230-400	6	=ElMep	1
-M2	028.0260	Elettropompa V.220-254/380-440.50-60 HZ 150W		Electropump V.220-240/380-415.50-60 HZ 150W			SPV33 o 4C0A6-12HP1	6	=ElMep	1
-M3	028.0260	Elettropompa V.220-254/380-440.50-60 HZ 150W		Electropump V.220-240/380-415.50-60 HZ 150W			SPV33 o 4C0A6-12HP1	6	=ElMep	1
-M8	019.3407	Motore stepper 12Nmt 6A 1,8°		Stepper motor 12Nmt 6A 1,8°			FL886TH156-5708AL FULLING	9	=ElMep	1
-M9	019.3555	Motore stepper 1,9Nmt 2,8A 1,8°		Stepper motor 1,9Nmt 2,8A 1,8°			FL57STH76-2804-A-12 FULLING	24	=ElMep	1
-R0	022.2152	Tensionatore elettronico 3T		Electronic tensioner 3T			TR-S-A/3T 1,5V- 900Kg Deltateck	23	=ElMep	1
-R5	022.0046	Potenziometro 2K2 monogiro		Potentiometer 2K2 single turn			6639S-001-202	22	=ElMep	1
-S10	022.0527	Sensore di prossimita PNP corto conn. M12		Proximity sensor PNP short with M12 connector.			B02122P0C5 - SELET	19	=ElMep	1
-S15	090.0271	Impugnatura					090.0271	18	=ElMep	1
-S47	022.0543	Finecorsa a rotella 1NO+1NC conn. M12 laterale		Limit Switch with roll 1NO+1NC			NB B110BB-DMK PIZZATO	19	=ElMep	1
-SQ0	022.0522	Sensore di prossimita PNP lungo conn. M12		Proximity sensor PNP long with M12 connector.			B00122-DIS388 - SELET	18	=ElMep	1
-XGIU	022.2256	Morsetto da 2.5 mm singolo per 2 fili a molla		Single pole spring terminal 2,5mmq			56.703.0055.0		=ElMep	2
-XR5	022.0369	Connettore 3 poli per tensionatore elettronico		Connector 3-poles for strain gauge			022.0369		=ElMep	1
-XS7	022.0369	Connettore 3 poli per tensionatore elettronico		Connector 3-poles for strain gauge			022.0369		=ElMep	1
-K6	022.3011	Contattore 3KW - NC (24 V Dc)		Contactor 3KW NC (24 V Dc)			DILM7-01 cod.276600 Moeller	20	=EvTr	1
	022.3924	Kit ponti potenza per teleinvertitore		Kit for contactor reversing			DILM12-XLR			1
-K06	022.3011	Contattore 3KW - NC (24 V Dc)		Contactor 3KW NC (24 V Dc)			DILM7-01 cod.276600 Moeller	20	=EvTr	1
-M5	019.4052	Motore EVTR CR71B4, 0.37KW, 230-400/277-480V, 2,0/1,15A, 1400/1630Rpm, 50/60Hz		Chip Conveyor Motor 0.37KW, 230-280/400-480V, 2/1.15A,50/60Hz			019.4052	7	=EvTr	1
-Q-K06	022.3820	Rele termico 1-1,6A		Termal overload 1-1,6A			ZB12-1,6A cod. 278436Moeller	7	=EvTr	1
-X-CK03	022.0281 + 022.0262	Connettore fisso ILME (CK03I + CKF03)		Fixed connector ILME (CK03I + CKF03)			CK03I + CKF03		=EvTr	1
-X-CK03M	022.0282 + 022.0261	Connettore volante ILME (CK03VS pioli + CKM03)		Mobile connector ILME (CK03VS + CKM03) 4 poles			CK03VS + CKM03		=EvTr	1
-AL	2.5 mm	Morsetto da 2.5 mm non abbinato a costruttore							=QgCv	5
-BR1	022.0900	Barra omega		Omega guide DIN				31	=QgCv	1
-C1	022.2982	Condensatore elettrolitico 4700uF/50V		Condenser 4700uF/50V			FHS 25x30	26	=QgCv	1
-CC1	022.0304	Terminale a occhiello (Rosso)		Wire Terminal Connection Red			Ø5 da 1,5mmq A5/P-B15/P	31	=QgCv	1
-CN1	022.0901	Canalina portacavi in plastica		Cable holding plastic channel			25x40	31	=QgCv	1
-CR1	022.2602	Guaina POLIFLEX Ø18		Poliflex Covering Ø18			NW 14-1200143	32	=QgCv	1
-CR2	022.2602	Guaina POLIFLEX Ø18		Poliflex Covering Ø18			NW 14-1200143	32	=QgCv	1
-CR3	022.2602	Guaina POLIFLEX Ø18		Poliflex Covering Ø18			NW 14-1200143	32	=QgCv	1
-CR4	022.2601	Guaina POLIFLEX Ø16		Poliflex Covering Ø16			NW 12-1200127	33	=QgCv	1
-CR5	022.2602	Guaina POLIFLEX Ø18		Poliflex Covering Ø18			NW 14-1200143	33	=QgCv	1
-CR6	022.0197	Guaina POLIFLEX Ø35		Poliflex Covering Ø35			NW 29-3800296	33	=QgCv	1

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CAD SPAC
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Data 01-04-2019

Impianto/Plant: SHARK 281-332NC5.0 - CEI PLe
Denominazione/Title: DISTINTA MATERIALI / Material List

Ordine/Requisition:
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Esecutore/Executor: MEP S.p.A.

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Nome/Item	Mep__code	Descrizione IT		Descrizione EN (Db)			Codice Interno	Fg/Sh	Quadro/Board	Q.ta/Q.ty
-CR7	022.2601	Guaina POLIFLEX Ø16		Poliflex Covering Ø16			NW 12-1200127	34	=QgCv	1
-CR8	022.2602	Guaina POLIFLEX Ø18		Poliflex Covering Ø18			NW 14-1200143	34	=QgCv	1
-CU1	022.0279	Kit morsetti volanti Mep50C		Kit mobile terminals Mep50C controller			ISAC	17	=QgCv	1
	022.0760.1	Display MEP50 TS_REV1		Display MEP50 TS_REV1			RAKIT7WIDE. TFT 7" Word WideTouch Screen +Cavo dati			1
	022.2834	Controllore Mep50C__V1.0__senza display		Controller Mep50C__V1.0__without display						1
	031.2085	Consolle di programmazione MEP 50 V.1.0 TOUCH SCREEN 7 INCH X NC EVO-SH230NCHS		Programming consolled MEP 50 V.1.0 TOUCH SCREEN 7 INCH X NC EVO-SH230NCHS						1
-F1	022.2239	Portafusibile 3 x (10,3x38) - 690V 32A		Fuse holding terminal 3 x (10,3x38) 690V 32A			2033038 BCH 32A ItalWeber	6	=QgCv	1
	022.1161	Fusibile 10,3x38 AM (ritardato) 6A		Fuse 10,3x38 AM			500V 6AMP			3
-F2	022.2239	Portafusibile 3 x (10,3x38) - 690V 32A		Fuse holding terminal 3 x (10,3x38) 690V 32A			2033038 BCH 32A ItalWeber	6	=QgCv	1
	022.1161	Fusibile 10,3x38 AM (ritardato) 6A		Fuse 10,3x38 AM			500V 6AMP			3
-F10	022.2253	Portafusibile 1 x (10,3x38) - 690V 32A		Fuse holding terminal 1 x (10,3x38) 690V 32A			2031038 BCH 32A ItalWeber	8	=QgCv	1
	022.1160	Fusibile 10,3x38 AM (ritardato) 8A		Fuse 10,3x38 AM			500V 8AMP			1
-F15	022.2253	Portafusibile 1 x (10,3x38) - 690V 32A		Fuse holding terminal 1 x (10,3x38) 690V 32A			2031038 BCH 32A ItalWeber	8	=QgCv	1
	022.1162	Fusibile 10,3x38 AM (ritardato) 4A		Fuse 10,3x38 AM			500V 4AMP			1
-F16	022.2253	Portafusibile 1 x (10,3x38) - 690V 32A		Fuse holding terminal 1 x (10,3x38) 690V 32A			2031038 BCH 32A ItalWeber	8	=QgCv	1
	022.1162	Fusibile 10,3x38 AM (ritardato) 4A		Fuse 10,3x38 AM			500V 4AMP			1
-F17	022.2253	Portafusibile 1 x (10,3x38) - 690V 32A		Fuse holding terminal 1 x (10,3x38) 690V 32A			2031038 BCH 32A ItalWeber	8	=QgCv	1
	022.1163	Fusibile 10,3x38 AM (ritardato) 2A		Fuse 10,3x38 AM			500V 2AMP			1
-F18	022.2253	Portafusibile 1 x (10,3x38) - 690V 32A		Fuse holding terminal 1 x (10,3x38) 690V 32A			2031038 BCH 32A ItalWeber	21	=QgCv	1
	022.1162	Fusibile 10,3x38 AM (ritardato) 4A		Fuse 10,3x38 AM			500V 4AMP			1
-F19	022.2253	Portafusibile 1 x (10,3x38) - 690V 32A		Fuse holding terminal 1 x (10,3x38) 690V 32A			2031038 BCH 32A ItalWeber	21	=QgCv	1
	022.1163	Fusibile 10,3x38 AM (ritardato) 2A		Fuse 10,3x38 AM			500V 2AMP			1
-FL1	022.0171	Cordicella unipolare 0,50mmq		Single wire 0.5mmq				31	=QgCv	1
-FL2	022.0172	Cordicella unipolare 1,50mmq		Single wire 1,50mmq				31	=QgCv	1
-FS1	019.5353	Fascetta in plastica 140x3,5		Plastic clamp 140x3,5			32031 Legrand	31	=QgCv	1
-FT1	022.2240	Portafusibile 2 x (10,3x38) - 690V 32A		Fuse holding terminal 2 x (10,3x38) 690V 32A			2032038 BCH 32A ItalWeber	8	=QgCv	1
	022.1162	Fusibile 10,3x38 AM (ritardato) 4A		Fuse 10,3x38 AM			500V 4AMP			2
-FT2	022.2240	Portafusibile 2 x (10,3x38) - 690V 32A		Fuse holding terminal 2 x (10,3x38) 690V 32A			2032038 BCH 32A ItalWeber	8	=QgCv	1
	022.1161	Fusibile 10,3x38 AM (ritardato) 6A		Fuse 10,3x38 AM			500V 6AMP			2
-G1	022.0908	Alimentatore Switching Vi 230-400-500VAC Vu 24Vdc 14A		Switching power supply Vi 240-400-500VAC Vu 24Vcc 14A			FLEX28024B AdelSystem	8	=QgCv	1
-GH1	022.0244	DADO 3217B GRIGIO PG 13,5		Nut Pg 13,5			PG13.5	32	=QgCv	1
-GH2	022.0244	DADO 3217B GRIGIO PG 13,5		Nut Pg 13,5			PG13.5	32	=QgCv	1
-GH3	022.0244	DADO 3217B GRIGIO PG 13,5		Nut Pg 13,5			PG13.5	32	=QgCv	1
-GH4	022.0244	DADO 3217B GRIGIO PG 13,5		Nut Pg 13,5			PG13.5	32	=QgCv	1
-GH5	022.0238	Pressacavo PG7		Cable Gland			BS01	32	=QgCv	1
-GH7	022.2701	Dado PG11		Nut PG11			BL03	33	=QgCv	1
-GH8	022.0244	DADO 3217B GRIGIO PG 13,5		Nut Pg 13,5			PG13.5	33	=QgCv	1
-GH9	022.0247	Dado poliammide PG29		Nut Poliammide PG29			PG29	33	=QgCv	1
-GH10	022.0245	Dado grigio PG11					PG11	34	=QgCv	1
	022.0247	Dado poliammide PG29		Nut Poliammide PG29			PG29			1
-GH12	022.0244	DADO 3217B GRIGIO PG 13,5		Nut Pg 13,5			PG13.5	34	=QgCv	1
-GH13	022.0244	DADO 3217B GRIGIO PG 13,5		Nut Pg 13,5			PG13.5	34	=QgCv	1
-GH14	022.0246	Dado grigio PG9					PG9	35	=QgCv	1
-GH15	022.0246	Dado grigio PG9					PG9	35	=QgCv	1
-H1	022.3254	Lampeggiante LED 24 VAC		Flashing LED 24 VAC/Vdc			SL7-CB-IMH + SL7-BL24 + SL7-AP24	20	=QgCv	1

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Translation of the original instructions

Nome/Item	Mep_code	Descrizione IT	Descrizione EN (Db)	Codice Interno	Fg/Sh	Quadro/Board	Q.ta/Q.ty
-K0	022.0555	Bobina di minima 400/50	Releaser 400/50	U-PKZO V.400.50 cod. 073138 - Moeller	5	=QgCv	1
-K4	022.3012	Contattore 3KW NO (24 V Dc)	Contactor 3KW NO (24 V Dc)	DILM7-10 cod.276565 Moeller	20	=QgCv	1
-K65	022.3012	Contattore 3KW NO (24 V Dc)	Contactor 3KW NO (24 V Dc)	DILM7-10 cod.276565 Moeller	20	=QgCv	1
-KS10		Bobina rele' Ausiliario			11	=QgCv	1
-M6	019.5220	Ventola raffreddamento 120x120 24Vdc	Fan cooling 120x120 24Vdc	V108MBW24DC AlfaPlastic	10	=QgCv	1
	019.5117	Griglia per ventola 120x120	Cover for fan cooler 120x120	ALFA GM120			1
	034.0431	Base per ventola 120x120 230V	Base for fan cooling 120x120	A12-7032			1
	028.0174	Filtro per ventola 120x120	Fan filter 120x120	M12R			1
	034.0414	Coperchio alettatore per ventola 120x120	Fan filter 120x120	M12C-7032			1
-M7	019.5221	Ventola raffreddamento 80x80 - 24Vdc	Fan cooling 80x80 - 24Vdc	V108 DSW24V - ALFAELECTRIC	10	=QgCv	1
	019.5123	Griglia per ventola 80x80	Cover for fan cooler 80x80	ALFA GM 80			1
	016.0624	Staffa per ventola azionamento P/P	Support for driver fan cooler				1
-NM1	022.0290	Etichetta segnafilo	Cable maker and wire		31	=QgCv	1
-NM2	022.0290	Etichetta segnafilo	Cable maker and wire		31	=QgCv	1
-PC1	022.0234	Pressacordone	Cable Gland Strain Relief	3246 nero PG13,5	34	=QgCv	1
-PT1	022.0311	Terminale a puntale da (Bianco)	Wire Terminal Connection White	0,5mmq DZ5CE005	31	=QgCv	1
-PT3	022.0312	Terminale a puntale da (Nero)	Wire Terminal Connection Black	1,5mmq DZ5CE015	31	=QgCv	1
-Q-K4	022.3819	Rele termico 0.6-1.0A	Termal overload 0.6-1.0A	ZB12-1.0A cod. 278435 Moeller	6	=QgCv	1
-Q-K65	022.3821	Rele termico 1,6-2,4A	Termal overload 1,6-2,4A	ZB12-2,4A cod. 278437 Moeller	6	=QgCv	1
-Q0	022.1287	Magnetotermico 6.3-10A	Magneto-termal overload 6.3-10A	PKZM0-10 cod. 72739 Moeller	5	=QgCv	1
-QC1	016.0793	Quadro comandi completo SH 281-282-330-332 NC 5.0	Control Panel SH 281-282-330-332 NC 5.0	016.0793	31	=QgCv	1
-QD2	016.1195	Scatola derivazione metallica SH NC	Metal junction box for SH NC?	240x100 P.65	32	=QgCv	1
-QD3	022.0124	Custodia isolante con manopola rossa	Housing with red handle	E-PKZO-GR - Moeller	34	=QgCv	1
	022.0125	Blocco porta luchettabile	Lockable block	SVB-PKZO-E cod.35127 - Moeller			1
-R-M25	010.3744	Manopola Alluminio Nero e Logo Mep	Black Knob with Mep Icon	Ø38x23mm - Albero Ø6	23	=QgCv	1
	025.0235	Anello di tenuta	Potentiometer 10K single turn	NI-18-25-4.5			1
	022.1816	Potenziometro 10Kohm	Potentiometer 10Kohm single turn				1
-RD1	022.0349	Riduzione	Joint Reduction	M/F M20/PG13,5	33	=QgCv	1
-RD3	022.0349	Riduzione	Joint Reduction	M/F M20/PG13,5	34	=QgCv	1
-RE1	022.0211	Raccordo rapido dritto SEM PG13,5/Ø19	Rapid straight joint SEM PG13,5/Ø19	SEM PG13,5/Ø19	32	=QgCv	1
-RE2	022.0211	Raccordo rapido dritto SEM PG13,5/Ø19	Rapid straight joint SEM PG13,5/Ø19	SEM PG13,5/Ø19	32	=QgCv	1
-RE3	022.0211	Raccordo rapido dritto SEM PG13,5/Ø19	Rapid straight joint SEM PG13,5/Ø19	SEM PG13,5/Ø19	32	=QgCv	1
-RE4	022.0211	Raccordo rapido dritto SEM PG13,5/Ø19	Rapid straight joint SEM PG13,5/Ø19	SEM PG13,5/Ø19	32	=QgCv	1
-RE5	022.0211	Raccordo rapido dritto SEM PG13,5/Ø19	Rapid straight joint SEM PG13,5/Ø19	SEM PG13,5/Ø19	32	=QgCv	1
-RE6	022.2702	Dado PG7	Nut PG7	BL01	32	=QgCv	1
-RE7	022.0227	Pressacavo M20	Cable Gland M20	M20	32	=QgCv	1
-RE8	022.0210	Raccordo rapido dritto PG11/Ø16	Rapid straight Joint PG11/Ø16	SEM PG11/Ø16	33	=QgCv	1
-RE9	022.0211	Raccordo rapido dritto SEM PG13,5/Ø19	Rapid straight joint SEM PG13,5/Ø19	SEM PG13,5/Ø19	33	=QgCv	1
-RE10	022.0211	Raccordo rapido dritto SEM PG13,5/Ø19	Rapid straight joint SEM PG13,5/Ø19	SEM PG13,5/Ø19	33	=QgCv	1
-RE11	022.0209	Raccordo rapido dritto PG29/Ø35	Rapid straight Joint PG29/Ø35	SEM PG29/Ø35	33	=QgCv	1
-RE12	022.0209	Raccordo rapido dritto PG29/Ø35	Rapid straight Joint PG29/Ø35	SEM PG29/Ø35	33	=QgCv	1
-RE13	022.0210	Raccordo rapido dritto PG11/Ø16	Rapid straight Joint PG11/Ø16	SEM PG11/Ø16	34	=QgCv	1
-RE14	022.0210	Raccordo rapido dritto PG11/Ø16	Rapid straight Joint PG11/Ø16	SEM PG11/Ø16	34	=QgCv	1
-RE15	022.0211	Raccordo rapido dritto SEM PG13,5/Ø19	Rapid straight joint SEM PG13,5/Ø19	SEM PG13,5/Ø19	34	=QgCv	1
-RE16	022.0211	Raccordo rapido dritto SEM PG13,5/Ø19	Rapid straight joint SEM PG13,5/Ø19	SEM PG13,5/Ø19	34	=QgCv	1

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Data 01-04-2019

Impianto/Plant: SHARK 281-332NC5.0 - CEI PLe
Denominazione/Title: DISTINTA MATERIALI / Material List

Ordine/Requisition:
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Nome/Item	Mep_code	Descrizione IT		Descrizione EN (Db)			Codice Interno	Fg/Sh	Quadro/Board	Q.ta/Q.ty
-RE17	022.0230	Pressacavo		Cable Gland			PG9	35	=QgCv	1
-RE18	022.0237	Pressacavo PG11		Cable Gland PG11			BS03	35	=QgCv	1
-RSE1	022.3290	Modulo espansione 3NO+1NC PIe		Expansion module 3NO +1NC			CS ME03VU24 - PIZZATO	11	=QgCv	1
-RSE2	022.3290	Modulo espansione 3NO+1NC PIe		Expansion module 3NO +1NC			CS ME03VU24 - PIZZATO	11	=QgCv	1
-RSP1	022.3289	Controllore programmabile di sicurezza PIe 24DI, 8SO, 8DO		'Programmable safety controller PIe 24DI, 8SO, 8DO			GEMNIS CSMP308 - PIZZATO	11	=QgCv	1
-S3	022.1406	Pulsante giallo		Yellow push button			M22-D-Y cod. 216598	19	=QgCv	1
	022.0937	Contatto pulsantiera NA		Normally open contact			M22-K10 cod. 216376 Moeller			4
	022.0911	Portacontatti per pulsantiera		Carrier for pushbutton			M22-A cod. 216374			1
-S4	022.1245	Fungo emergenza		Emergency push button			M22-PVT cod.263467	12	=QgCv	1
	022.0936	Contatto pulsantiera NC		Normally close contact			M22-K01 cod. 216678 - Moeller			2
	022.0911	Portacontatti per pulsantiera		Carrier for pushbutton			M22-A cod. 216374			2
-S18	022.0911	Portacontatti per pulsantiera		Carrier for pushbutton			M22-A cod. 216374	19	=QgCv	1
	022.1405	Pulsante nero		Black push button			M22-D-S cod. 216590			1
	022.0937	Contatto pulsantiera NA		Normally open contact			M22-K10 cod. 216376 Moeller			1
-S23	022.1405	Pulsante M22-D-N cod. 216598 + M22-A cod 216374		Black push button			M22-D-S cod. 216590	20	=QgCv	1
	022.0937	Contatto pulsantiera NA M22-K10 cod. 216376		Normally open contact			M22-K10 cod. 216376 Moeller			1
	022.0911	Portacontatti per pulsantiera		Carrier for pushbutton			M22-A cod. 216374			1
-S48	022.0037	Finecorsa di sicurezza con chiave 1NO + 1NC		Safety Switch with key 1NO + 1NC			LS S11 ZB - MOELLER	5	=QgCv	1
-S54	022.3920	Joystick 4 posizioni instabile con sblocco		Joystic 4 positions unstable with unlocking			MSJ12-60B cod. EL770 4 - ABB	19	=QgCv	1
	022.0932	Contatto pulsantiera NA		Normally open contact			MCB-10 cod. EQ570 5 - ABB			4
-SF1	047.0182	Sacchetto portafusibili		Printed envelopes				31	=QgCv	1
-SLP	022.0937	Contatto pulsantiera NA		Normally open contact			M22-K10 cod. 216376 Moeller	14	=QgCv	1
	022.1226	Selettore stabile 2 pos.		2 position stable selector			M22-WKV cod.216874 - Moeller			1
-T2	022.1601	Trasformatore		Transformer			500 0-230-400 V.0-60/0-220	8	=QgCv	1
-TF1	031.2622	Targa sostituzione fusibili		Replace fuse adhesive sign				31	=QgCv	1
-TF2	025.0604	Guarnizione aerstop adesiva		Control panel gasket				31	=QgCv	1
-TR2	022.2903	Toroide ferrite N30 r40		Ferrites Toroids N30 r40			212-0976 - RS	9	=QgCv	1
-TR3		Interruttore automatico magnetotermico sezionatore tripolare						25	=QgCv	1
-TR4	022.2903	Toroide ferrite N30 r40		Ferrites Toroids N30 r40			212-0976 - RS	26	=QgCv	1
-U1	022.0768	Inverter V400-480.50.60, 3KW		Inverter V380-480.50.60, 3KW			I550 - I55AE230F1A010003S - LENZE	6	=QgCv	1
	022.2003	Tastierino programmazione inverter I550		Keyboard inverter I550 programming			I5MADK0000000S - LENZE			1
-U10	022.1330	Azionamento per motori passo-passo (30-100V) + modbus		Driver for step motor (30-100V) + modbus			APSL3 E OP/S130	9	=QgCv	1
-X	2.5 mm	Morsetto da 2.5 mm non abbinato a costruttore							=QgCv	1
-X-M20	010.3744	Manopola Alluminio Nero e Logo Mep		Black Knob with Mep Icon			Ø38x23mm - Albero Ø6	26	=QgCv	1
	025.0235	Anello di tenuta		Potentiometer 10K single turn			NI-18-25-4.5			1
	022.1322	Encoder da pannello Mep50		Panel encoder Mep 50						1
-X-M21	010.3744	Manopola Alluminio Nero e Logo Mep		Black Knob with Mep Icon			Ø38x23mm - Albero Ø6	26	=QgCv	1
	025.0235	Anello di tenuta		Potentiometer 10K single turn			NI-18-25-4.5			1
	022.1322	Encoder da pannello Mep50		Panel encoder Mep 50						1
-X003	022.0429	Connettore EV idra. in DC con varistore (V1401)		Connector for solenoid valve DC with varistor			2 poli + PE - V1401 SHIELD	20	=QgCv	1
-X008	022.0429	Connettore EV idra. in DC con varistore (V1401)		Connector for solenoid valve DC with varistor			2 poli + PE - V1401 SHIELD	21	=QgCv	1
-X009	022.0429	Connettore EV idra. in DC con varistore (V1401)		Connector for solenoid valve DC with varistor			2 poli + PE - V1401 SHIELD	21	=QgCv	1
-X010	022.0429	Connettore EV idra. in DC con varistore (V1401)		Connector for solenoid valve DC with varistor			2 poli + PE - V1401 SHIELD	21	=QgCv	1
-X011	022.0429	Connettore EV idra. in DC con varistore (V1401)		Connector for solenoid valve DC with varistor			2 poli + PE - V1401 SHIELD	21	=QgCv	1
-X012	022.0429	Connettore EV idra. in DC con varistore (V1401)		Connector for solenoid valve DC with varistor			2 poli + PE - V1401 SHIELD	21	=QgCv	1

				Dis. N. SHNC5.0/40050CE/1419	Impianto/Plant SHARK 281-332NC5.0 - CEI PLe	Ordine/Requisition	Foglio/Page 47
				CAD SPAC		Commessa/Order SH NC	Segue/Follow 48
				File SHNC5.0CEI\1.dwg	Denominazione/Title DISTINTA MATERIALI	Esecutore/Executor MEP S.p.A.	Ultimo/Last 216
R0.0.	First Draft	01/04/2019	MEP S.p.A.	Data 01-04-2019	Material List		
REV.	MODIFICA	DATA	FIRME				

0	1	2	3	4	5	6	7	8	9	
Nome/Item	Mep_code	Descrizione IT		Descrizione EN (Db)			Codice Interno	Fg/Sh	Quadro/Board	Q.ta/Q.ty
-X014	022.0429	Connettore EV idra. in DC con varistore (V1401)		Connector for solenoid valve DC with varistor			2 poli + PE - V1401 SHIELD	21	=QgCv	1
-XQG2	022.2243	Morsetto 2,5mmq per 2 fili a molla - PHOENIX		Terminal 2,5(4)mmq for 2 wires - PHOENIX			ST2,5- 3031212		=QgCv	16
-XQG3	022.2245	Morsetto 2,5(4)mmq per 4 fili a molla - PHOENIX		Terminal 2,5(4)mmq for 4 wires - PHOENIX			ST2,5- QUATTRO_3031306		=QgCv	15
-XQG4	022.2243	Morsetto 2,5mmq per 2 fili a molla - PHOENIX		Terminal 2,5(4)mmq for 2 wires - PHOENIX			ST2,5- 3031212		=QgCv	2
-XQGPE	022.2321	Barra da 15x15mm con 10 fori 6mm							=QgCv	1
-XSA	022.2243	Morsetto 2,5(4)mmq per 2 fili a molla - PHOENIX		Terminal 2,5(4)mmq for 2 wires - PHOENIX			ST2,5- 3031212		=QgCv	16
	022.2245	Morsetto 2,5(4)mmq per 4 fili a molla - PHOENIX		Terminal 2,5(4)mmq for 4 wires - PHOENIX			ST2,5- QUATTRO_3031306			3
-XSAPE	022.0377	Morsetto 2 fili a molla_PE_ST_PHOENIX		Terminal 4(6)mmq for 2 wires_PE_PHOENIX			USLKG5		=QgCv	2
-Z1		Interruttore automatico magnetotermico sezionatore tripolare						6	=QgCv	1

				Dis. N. SHNC5.0/40050CE/1419	Impianto/Plant SHARK 281-332NC5.0 - CEI PLe	Ordine/Requisition		Foglio/Page 48
				CAD SPAC				Segue/Follow 49
				File SHNC5.0CEI\1.dwg	Denominazione/Title DISTINTA MATERIALI	Commessa/Order SH NC		Ultimo/Last 216
R0.0.	First Draft	01/04/2019	MEP S.p.A.	Data 01-04-2019	*Material List*	Esecutore/Executor MEP S.p.A.		
REV.	MODIFICA	DATA	FIRME					

TIPO/TYPE	DESCRIZIONE/DESCRIPTION	DESCRIZIONE EN	NOME/ITEM	QUADRO/BOARD	QTA/QTY
022.0141	Cavo schermato 4x0.5 per tensionatore e potenziometro	Cable with shield 4 x 0.5mmq	-W20/1	=ElMep	2,00
			-W35	=Pe	4,00
			-W20	=QgCv	5,00
			-W21	=QgCv	5,00
			-W28	=QgCv	5,00
			-W29/1	=QgCv	2,20
			-W55	=QgCv	4,00
			-W56	=QgCv	3,00
			-W500	=QgCv	3,50
022.0147	Cavo schermato 12x0.5	Cable with shield 12 x 0.5mmq	-W117	=QgCv	2,00
			-W118	=QgCv	2,00
			-W119	=QgCv	2,00
022.0158	Cavo 5x1.5mmq	Cable 5 x 1.5mmq	-W1	=QgCv	4,00
			-W29	=QgCv	1,60
022.0159	Cavo 8x0.5mmq	Cable 8 x 0.5mmq	-W119/1	=QgCv	5,00
022.0160	Cavo 2x0.5mmq	Cable 2 x 0.5mmq	-W121/1	=ElMep	1,50
			-W30	=EvTr	3,50
			-W95	=LuTr	1,00
			-W1 dc	=QgCv	2,00
			-W36	=Pe	4,00
			-W37	=QgCv	1,00
			-W39	=QgCv	0,50
			-W52	=QgCv	2,00
			-W89	=LuMn	1,60
			-W90	=QgCv	1,50
			-W91	=QgCv	1,50
			-W92	=QgCv	1,50
			-W93	=QgCv	1,50
			-W122	=LuMn	1,60
			-W123	=QgCv	1,50
			-W124	=QgCv	1,50

REV.	MODIFICA	DATA	FIRME
R0.0.	First Draft	01/04/2019	MEP S.p.A.

Dis. N SHNC5.0/40050CE/1419
CAD SPAC
File SHNC5.0CEI\1.dwg
Data 01-04-2019

Impianto/Plant: SHARK 281-332NC5.0 - CEI PLe
Denominazione/Title: DISTINTA CAVI / Cable List

Ordine/Requisition:
Commessa/Order: SH NC
Esecutore/Executor: MEP S.p.A.

Foglio/Page: 49
Segue/Follow: 50
Ultimo/Last: 216

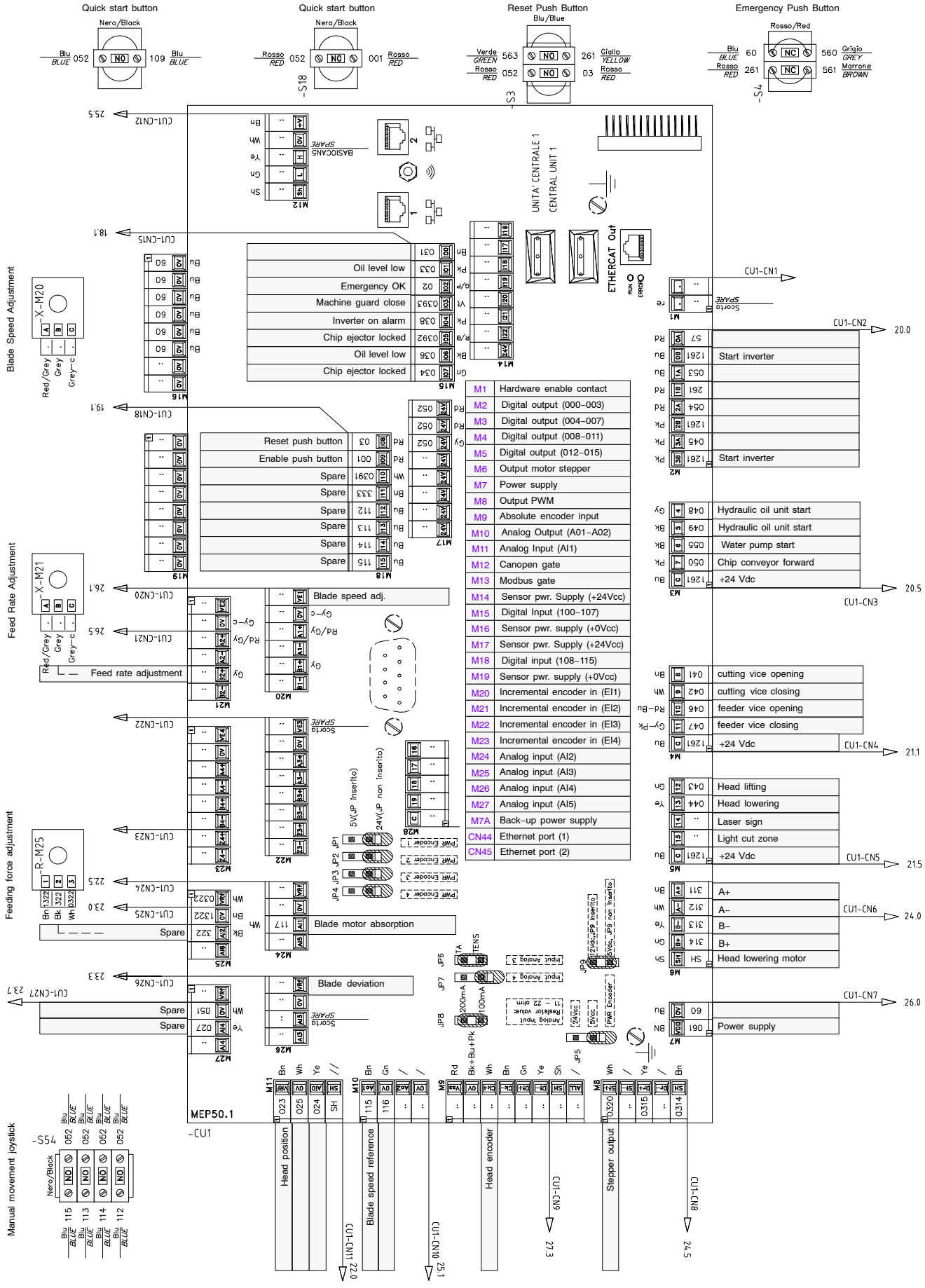
Translation of the original instructions

0	1	2	3	4	5	6	7	8	9

TIPO/TYPE	DESCRIZIONE/DESCRIPTION	DESCRIZIONE EN	NOME/ITEM	QUADRO/BOARD	QTA/QTY
022.0162	Cavo 4G0.75mmq	Cable 4 x 0.75mmq	-W7	=EvTr	2,00
			-W7/1	=EvTr	1,20
			-W4	=QgCv	1,50
			-W5	=QgCv	1,50
			-W11	=QgCv	1,50
			-W6	=SpPl	2,00
			-W6/C	=SpPl	0,70
022.0355	Cavo 3xAwg24 per proxy con connettore M8 dritto. L=5Mt	Cable with straight connector M8. L=5Mt	-W96	=LuTr	1,00
022.0376	Cavo 3xAwg24 per prossimity con connettore M12 90°. L=5Mt	Cable 3xAwg24 for prossimity with connector M12 90°. L=5Mt	-W27	=QgCv	1,50
			-W59	=QgCv	2,80
022.0397	Cavo 4xAwg24 per prossimity con connettore M12 dritto L=5Mt	Cable 3xAwg24 for prossimity with straight connector M12 L=5Mt	-W56/1	=ElMep	1,20
			-W57	=ElMep	3,00
			-W57/1	=ElMep	2,30
			-W57/2	=ElMep	1,00
022.0409	Cavo schermato 8x0.5 con connettore circolare per encoder	Cable with shield 8 x 0.5mmq with round connector for encoder	-WENC	=VsAn	5,00
022.3301	Cavo schermato 8x0.5mmq	Solenoid 24VCC for idraulic valve	-W120/1	=QgCv	2,40

				Dis. N SHNC5.0/40050CE/1419	Impianto/Plant SHARK 281-332NC5.0 - CEI PLe	Ordine/Requisition		Foglio/Page 50
				CAD SPAC		Commessa/Order SH NC		Segue/Follow 100
				File SHNC5.0CEI\1.dwg	Denominazione/Title DISTINTA CAVI	Esecutore/Executor MEP S.p.A.		Ultimo/Last 216
R0.0.	First Draft	01/04/2019	MEP S.p.A.	Data 01-04-2019	*Cable List*			
REV.	MODIFICA	DATA	FIRME					

MEP50 central unit

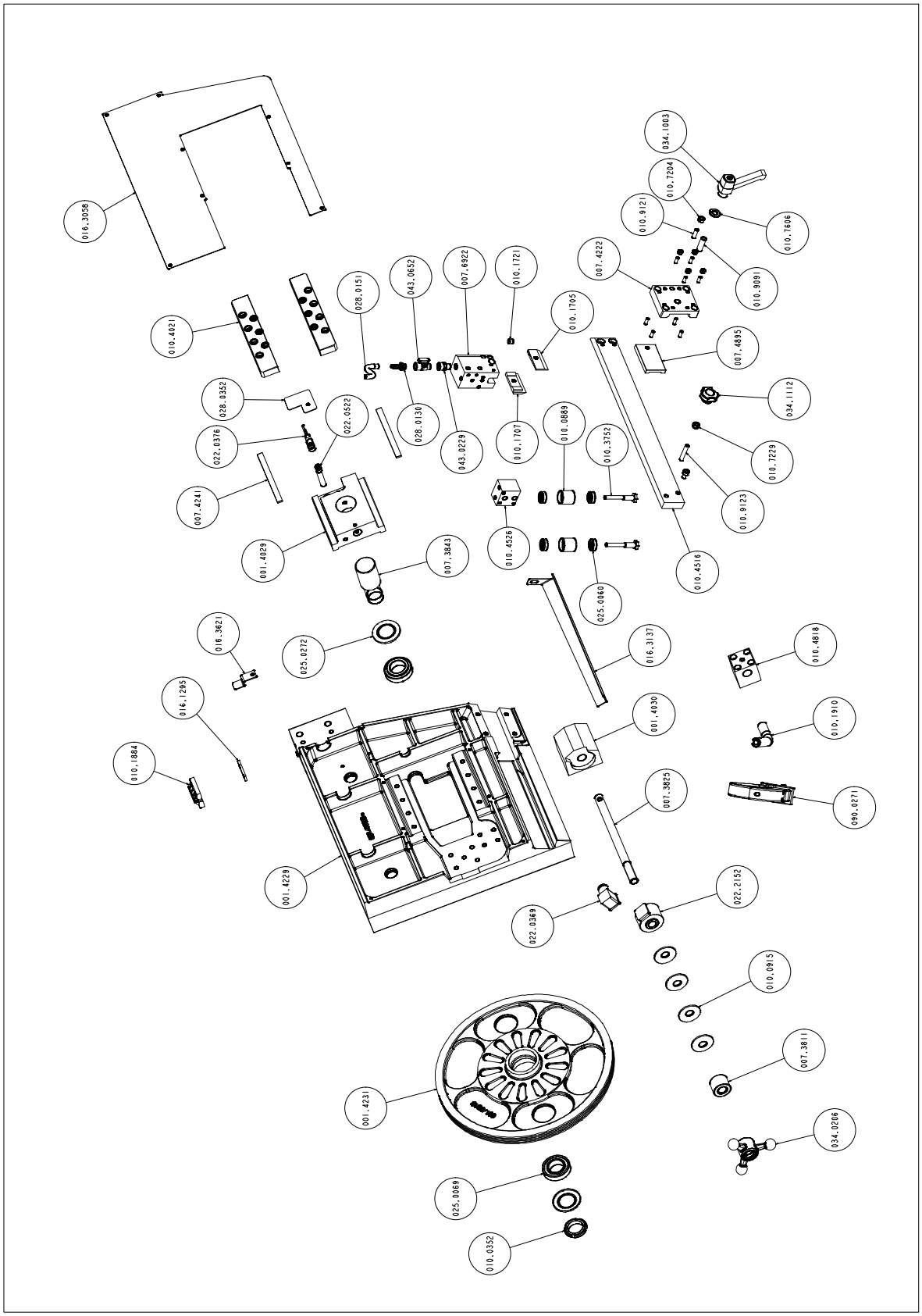


M1	Hardware enable contact
M2	Digital output (000–003)
M3	Digital output (004–007)
M4	Digital output (008–011)
M5	Digital output (012–015)
M6	Output motor stepper
M7	Power supply
M8	Output PWM
M9	Absolute encoder input
M10	Analog Output (A01–A02)
M11	Analog Input (AI1)
M12	Canopen gate
M13	Modbus gate
M14	Sensor pwr. Supply (+24Vcc)
M15	Digital Input (100–107)
M16	Sensor pwr. supply (+0Vcc)
M17	Sensor Pwr. Supply (+24Vcc)
M18	Digital input (108–115)
M19	Sensor pwr. supply (+0Vcc)
M20	Incremental encoder in (EI1)
M21	Incremental encoder in (EI2)
M22	Incremental encoder in (EI3)
M23	Incremental encoder in (EI4)
M24	Analog input (AI2)
M25	Analog input (AI3)
M26	Analog input (AI4)
M27	Analog input (AI5)
M7A	Back-up power supply
CN44	Ethernet port (1)
CN45	Ethernet port (2)

Exploded views

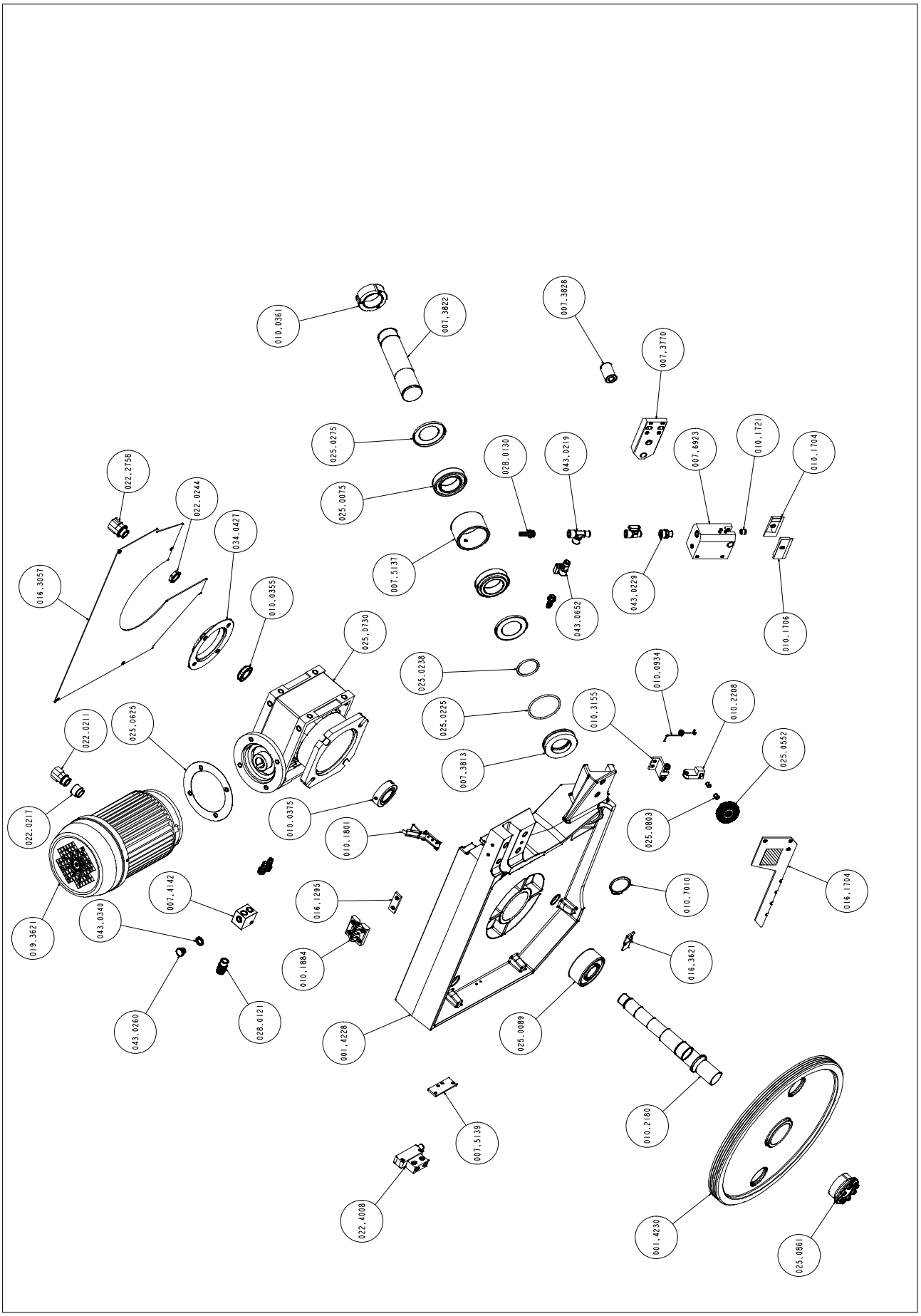
This part of the manual contains detailed exploded views of the machine which can help to gain a deeper knowledge of how it is made.

Front flywheel assembly



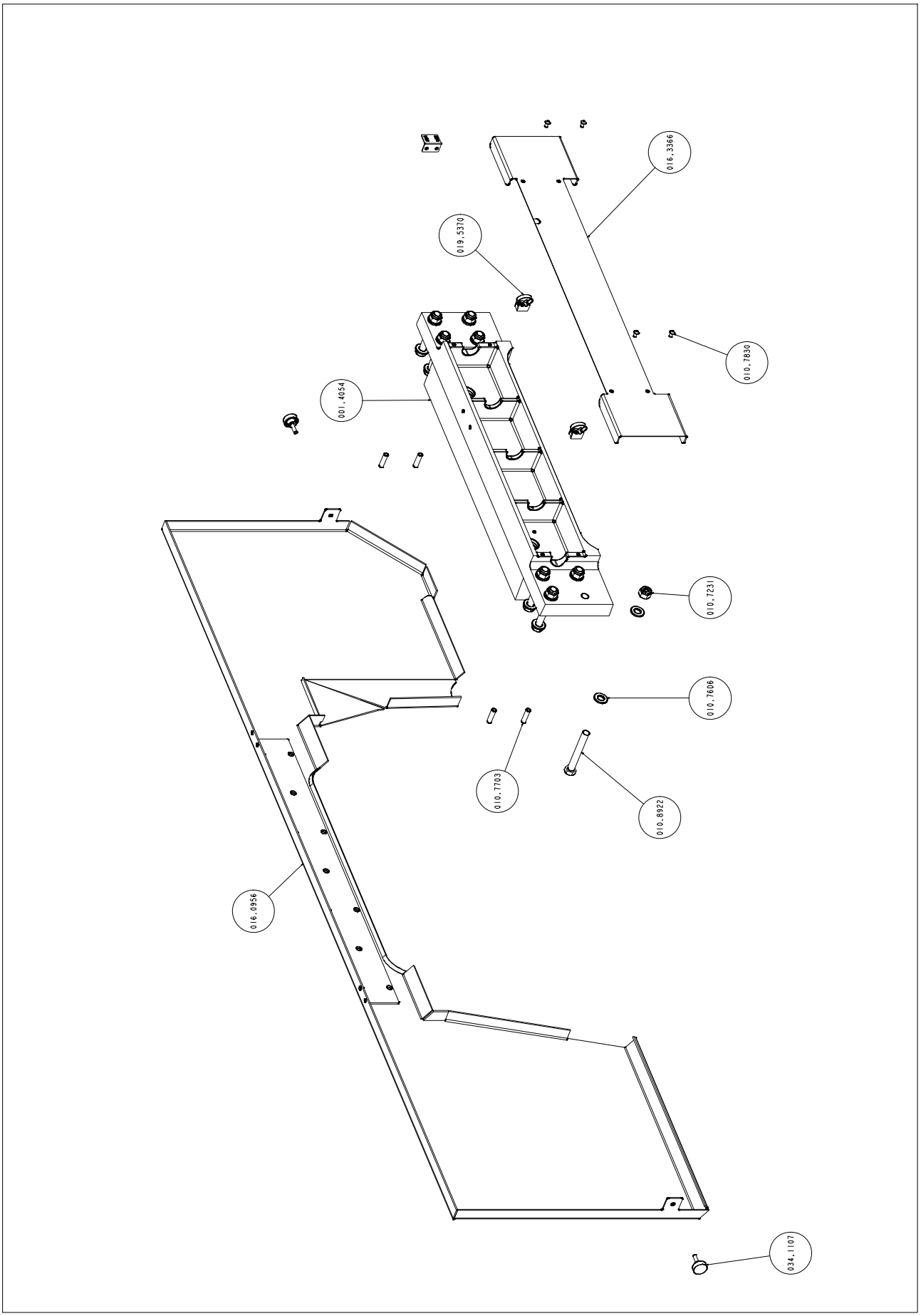
Code	Description	Description	Q.ty
001.4029	SLITTA TENDILAMA ARCHETTO MOD. 1226	SLIDE MOD. 1226	1,000
001.4030	SUPPORTO TENSIONAMENTO LAMA ELETT. MOD.1403	SUPPORT MOD.1403	1,000
001.4229	ARCHETTO SEZIONE PULEGGIA FOLLE SH 332	IDLER WHEEL BOW SH 332 ”15”	1,000
001.4231	PULEGGIA FOLLE ARCHETTO SH 332 ”15”	BOW IDLER WHEEL SH 332 ”15”	1,000
007.3811	DISTANZIALE VOLANTINO	WHEEL SPACER	1,000
007.3825	PERNO REGISTRO TENSIONAMENTO LAMA	BAND TENSION REGISTER PIN	1,000
007.3843	ALBERO VOLANO LIBERO SH N.T.	IDLER WHEEL SHAFT SH N.S.	1,000
007.4222	STAFFA BLOCCAGGIO GUIDA TESTINA SH 332	LOCKING BRACKET SH 332	1,000
007.4241	LARDONE SLITTA TENDILAMA	BAND GUIDE SLIDE GIB	2,000
007.4895	LARDONE TESTINA SH 332	GIB HEAD	1,000
007.6922	TESTINA GUIDALAMA ANTERIORE SH 332–382	FRONT HEAD GUIDING BLADE SH 332–382	1,000
010.0352	GHIERA AUTOBLOCCANTE 35X1,5	SELF–LOCKING RING NUT 35X1,5	1,000
010.0889	RULLO PREMILAMA SH 230 NC HS	BAND PUSHER ROLLER SH 230 NC HS	1,000
010.0915	MOLLA A TAZZA 50X18,4X3	BELLEVILLE SPRING WASHERS 50X18,4X3	4,000
010.1705	GUIDALAMA 1 INSERTO ANTERIORE	1 INSERT FRONT BAND GUIDE	1,000
010.1707	GUIDALAMA 2 INSERTI ANTERIORE	2 INSERTS FRONT BAND GUIDE	1,000
010.1721	PREMILAMA SHARK	TOP CARBIDE SHARK	1,000
010.1884	CERNIERA X PROTEZIONE VW–18	PROTEC.HINGE VW–18CFA–49 CH5	1,000
010.1910	LEVA COMANDO TESTA BT	BT LEVER SH 320	1,000
010.3752	PERNO ECCENTRICO CUSCINETTI PREMILA-MA	BLADEPUSHER BEARING ECCENTRIC PIN SH230	1,000
010.4021	PIASTRA REGOLAZIONE SLITTA LARDONE	GIB SLIDE ADJUSTMENT PLATE	2,000
010.4516	SUPPORTO TESTINA ANT. SH 331–332–382	FRONT HEAD SUPPORT	1,000
010.4526	SUPPORTO RULLI TESTINA GUID. MOBILE	MOBILE ROLLER SUPPORT HEAD BLADE GUIDE	1,000
010.4818	SUPPORTO LEVA COMANDO TESTA SH 332	SUPPORT LEVER HEAD	1,000
010.7204	DADO M8	M8 SCREW NUT	1,000
010.7229	DADO AUTOBLOCCANTE M8	M8 SELF–LOCKING SCREW NUT	1,000
010.7606	RONDELLA 0 12	0 12 WASHER	1,000
010.9091	GRANO VCE PUNTA PIANA 12 X 35	12 X 35 FLAT POINT GRUB SCREW	1,000
010.9121	GRANO VCE PUNTA PIANA 8 X 25	8X25 FLAT POINT GRUB SCREW	1,000
010.9123	GRANO VCE PUNTA PIANA 8 X 45	8X45 FLAT POINT GRUB SCREW	1,000
016.1295	PIASTRINO SPESSORE CERNIERA SPM SH 332	HINGE PLATE THICKNESS	1,000
016.3058	CARTER POSTERIORE SPF SH 332	REAR CARTER	1,000
016.3137	PROTEZIONE LAMA ANTERIORE SH 331–332–382	FRONT BAND GUARD SH 331–332–382	1,000
016.3621	STAFFA DI FERMO SH 332–382	LOCKING BRACKET SH 332–382	1,000
022.0369	CONNETTORE PER BOBINA U2 E TENSIONA-TORETRSA/3T.00	CONNECTOR F.U2 COIL AND TENSIONER	1,000
022.0376	CONNETTORE 90° M12 CON 5 MT. CAVO 4X0,5PER PROSSIMITY	CONNECTOR FOR PROXIMITY	1,000
022.0522	SENSORE PROSSIMITA’ PNP X AX–NCEVO	PROXIMITY PNP AX	1,000
022.2152	TENSIONATORE ELETTRONICO TRSA/3T.00	ELECTRONIC TENSIONER TRSA/3T.00	1,000
025.0060	CUSCINETTO 6000 2Z	BEARING 6000 2Z	1,000
025.0069	CUSCINETTO 32007X	BEARING 32007X	2,000
025.0272	ANELLO DI PROTEZIONE NILOS 32007	NILOS SEAL RING 32007	2,000
028.0130	RACCORDO 1/4–9 CL 2601	JOINT 1/4–9 CL 2601	1,000
028.0151	TUBO PLASTIFICATO 07–11	PLASTIC HOSE 07–11	1,000
028.0352	PROTEZIONE GOMMA SLITTA TENDILAMA	RUBBER GUARD	1,000
034.0206	VOLANTINO TENSIONAMENTO LAMA	BAND TENSIONING HANDWHEEL	1,000
034.1003	LEVA A SCATTO 12 MA	LEVER 12 MA	1,000
034.1112	VOLANTINO O 40M8 X PIEDISTALLO	O 40 M8 HANDWHEEL X STEEL BASE	1,000
043.0229	RIDUZIONE MF 1/4 – CL 2520	MF 1/4 – CL 2520 REDUCTION	1,000
043.0652	RUBINETTO 1/4 F.M.	1/4 F. M. TAP	1,000
090.0271	IMPUGNATURA COMPLETA TIPO MEP	COMPLETE MEP HANDLE	1,000

Motor flywheel assembly



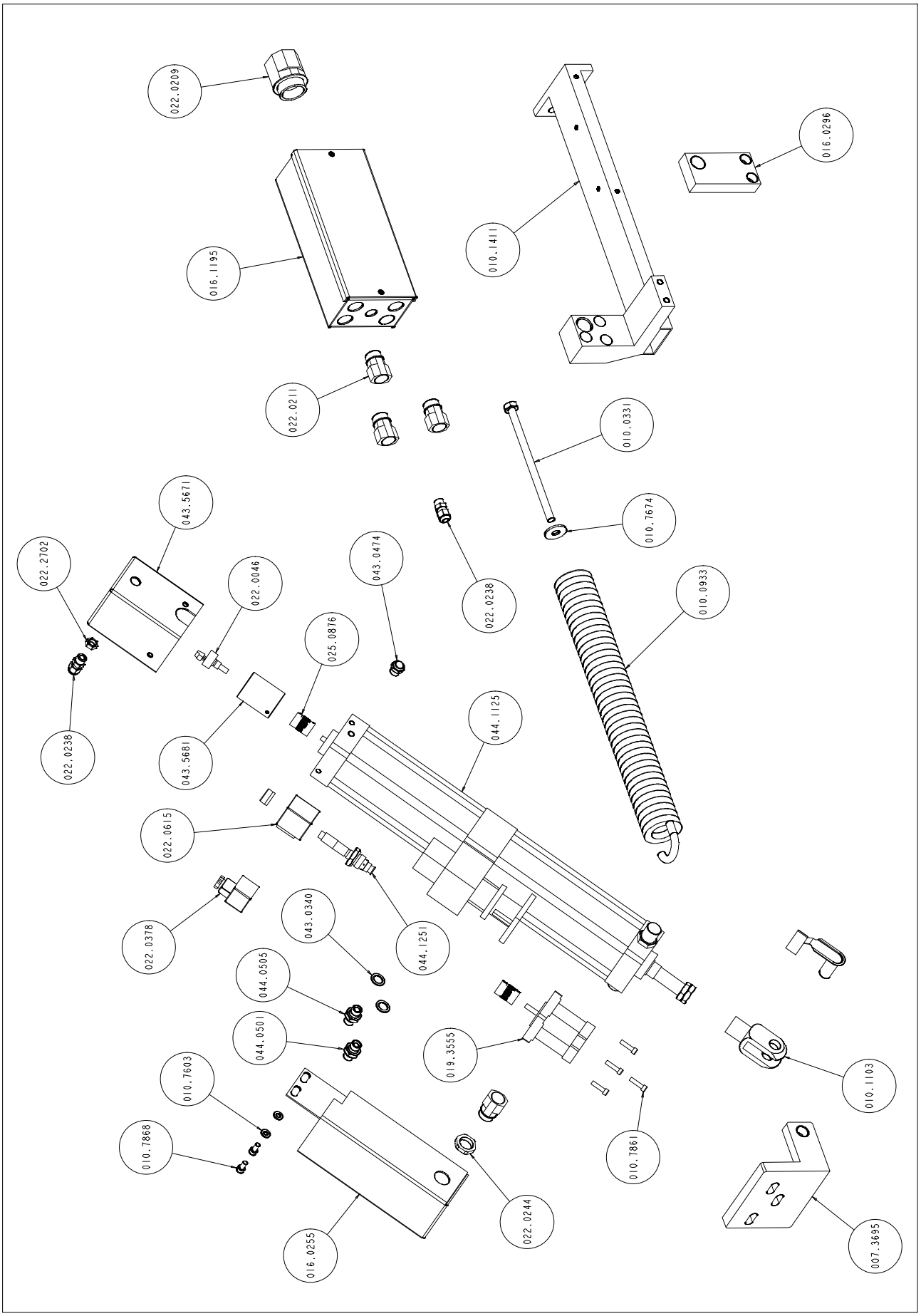
Code	Description	Description	Q.ty
001.4228	ARCHETTO SEZIONE PULEGGIA MOTRICE	BOW SH 320/330 WITHOUT REDUCER	1,000
001.4230	PULEGGIA MOTRICE SH 332 ”15” MOD.1422	MOTOR WHEEL SH 332 ”15”	1,000
007.3770	SUPPORTO TESTINA POSTERIORE SH 320 60	REAR HEAD SUPPORT SH 320 60	1,000
007.3813	DISTANZIALE ARCHETTO SH	BOW SPACER SH	1,000
007.3822	PERNO SUPPORTO SNODO TESTA SH 260–280–282–292–320–332	HEAD PIVOT SUPPORT PIN SH 260–280–320	1,000
007.3828	BOCCOLA BATTUTA FINECORSA SH320–332	LIMIT STROKE BUSHING SH 320	1,000
007.4142	SQUADRETTO PER LIQUIDO SH 282–292–320–330–332–H–14A	PLATE SH 320–330–H–14A	1,000
007.5137	DISTANZIALE CUSCINETTO SNODO TESTA	DISTANCE HEAD BEARING JOINT	1,000
007.5139	DISTANZIALE ARCHETTO SENSORE RFID SH 332	BOW DISTANCE SENSOR	1,000
007.6923	TESTINA GUIDALAMA POSTERIORE SH 332–382	REAR HEAD GUIDING BLADE SH 332–382	1,000
010.0355	GHIERA AUTOBLOCCANTE 25X1,5 TI SH 260–FC	SELF–LOCKING RING NUT 25X1,5 TI–SH260–FC	1,000
010.0361	GHIERA DI PRECISIONE 45X1,5	PRECISION RING NUT 45X1,5	1,000
010.0375	GHIERA ALBERO RIDUTTORE SH 332–330	LOCKNUT FOR DRIVE SHAFT SH 332–330	1,000
010.0934	MOLLA X PULILAMA SH N.T.	BAND BRUSHES SPRING SH N.T.	1,000
010.1704	GUIDALAMA 1 INSERTO POSTERIORE SH N.T.	1 INSERT REAR BAND GUIDE SH N.S.	1,000
010.1706	GUIDALAMA 2 INSERTI POSTERIORE SH N.T.	2 INSERTS RAER BAND GUIDE SH N.S.	1,000
010.1721	PREMILAMA SHARK	TOP CARBIDE SHARK	1,000
010.1801	CHIUSURA LEVA –D– ZINCATA SH	–D– ZINC LEVER CLOSURE SH	1,000
010.1884	CERNIERA X PROTEZIONE VW–18	PROTEC.HINGE VW–18CFA–49 CH5	1,000
010.2180	ALBERO RIDUTTORE TAGLIA 75 SH 332	DRIVE SHAFT	1,000
010.2208	PORTASPAZZOLA PULILAMA	BAND BRUSH HOLDER	1,000
010.3155	STAFFA FIX SPAZZOLA PULILAMA	FIX. BRACKET SH260–280–320–330HH	1,000
010.7010	ANELLO SEEGER 0 45	0 45 SEEGER RING	1,000
016.1295	PIASTRINO SPESSORE CERNIERA SPM SH 332	HINGE PLATE THICKNESS	1,000
016.1704	PROTEZIONE LAMA POST.SH 320–330–331–332	REAR BAND GUARD SH 320–330–331–332	1,000
016.3057	CARTER POSTERIORE SPM SH 332	REAR CARTER	1,000
016.3621	STAFFA DI FERMO SH 332–382	LOCKING BRACKET SH 332–382	1,000
019.3621	KW 2,2 M90L4P.B14V.230–400.50/255–440.60	KW 2,2 M90L4P.B14V.230–400.50/255–440.60	1,000
022.0211	RACCORDO RAPIDO SEM PG 13,5	RAPID JOINT SEM PG 13,5	1,000
022.0217	RIDUZIONE PG 16–M PG 13,5–F	REDUCTION	1,000
022.0244	CONTRODADO 3217B GRIGIO PG 13,5	LOCK NUT 3217B GREY PG 13,5	1,000
022.2758	RACCORDO RAPIDO SEM PG 13,5 AD 21,2	RAPID JOINT SEM PG 13,5 AD 21,2	1,000
022.4008	SENSORE DI SICUREZZA RFID ST DD420MK–D1T	SAFETY SENSORS WITH RFID TECHNO-LOGY	1,000
025.0075	CUSCINETTO 32009X	BEARING 32009X	1,000
025.0089	CUSCINETTO 3307 A2RS	BEARING 3307 A2RS	1,000
025.0225	ANELLO TENUTA OR 171–68,26	O RING 171–68,26	1,000
025.0238	ANELLO DI TENUTA OR 149–44,45X3,53	O RING 149–44,45X3,53	1,000
025.0275	ANELLO DI PROTEZIONE NILOS 32009X	NILOS GUARD RING 32009X	1,000
025.0552	SPAZZOLA PULILAMA SHARK 6X25X50	BAND BRUSH 6X25 030 SHARK	1,000
025.0625	GUARNIZIONE MOTORE SH 310–320–330	MOTOR GASKET SH 310–320–330	1,000
025.0730	RIDUTTORE FCNDKO75/RATIO=40:1,90 B14	GEARBOX FCNDKO75/RATIO=40:1,90 B14	1,000
025.0803	BOCCOLA GRAFITATA L. 10 DIAM. 6	GRAPHITIZED BUSHING L. 10 DIA M. 6	1,000
025.0861	CALETTATORE 0 35X60	CONNECTOR 0 35X60	1,000
028.0121	RACCORDO 3/8–17 CL 2601	JOINT 3/8–17 CL 2601	1,000
028.0130	RACCORDO 1/4–9 CL 2601	JOINT 1/4–9 CL 2601	1,000
034.0427	COPERCHIO RIDUTTORE FCNDKO75	FCNDKO75 SAFETY CAP	1,000
043.0219	RACCORDO A –T– MFF 1/4 POL. CL–2070 310I	MFF 1/4” CL–2070 310I T JOINT	1,000
043.0229	RIDUZIONE MF 1/4 – CL 2520	MF 1/4 – CL 2520 REDUCTION	1,000
043.0260	TAPPO TTE4 1/4 – CL 2611	1/4 TAP TTE4	1,000
043.0340	RONDELLA RAME 13X19X1,5–1/4	COPPER WASHER 13X19X1,5–1/4	6,000
043.0652	RUBINETTO 1/4 F.M.	1/4 F. M. TAP	1,000

Cutting head cover



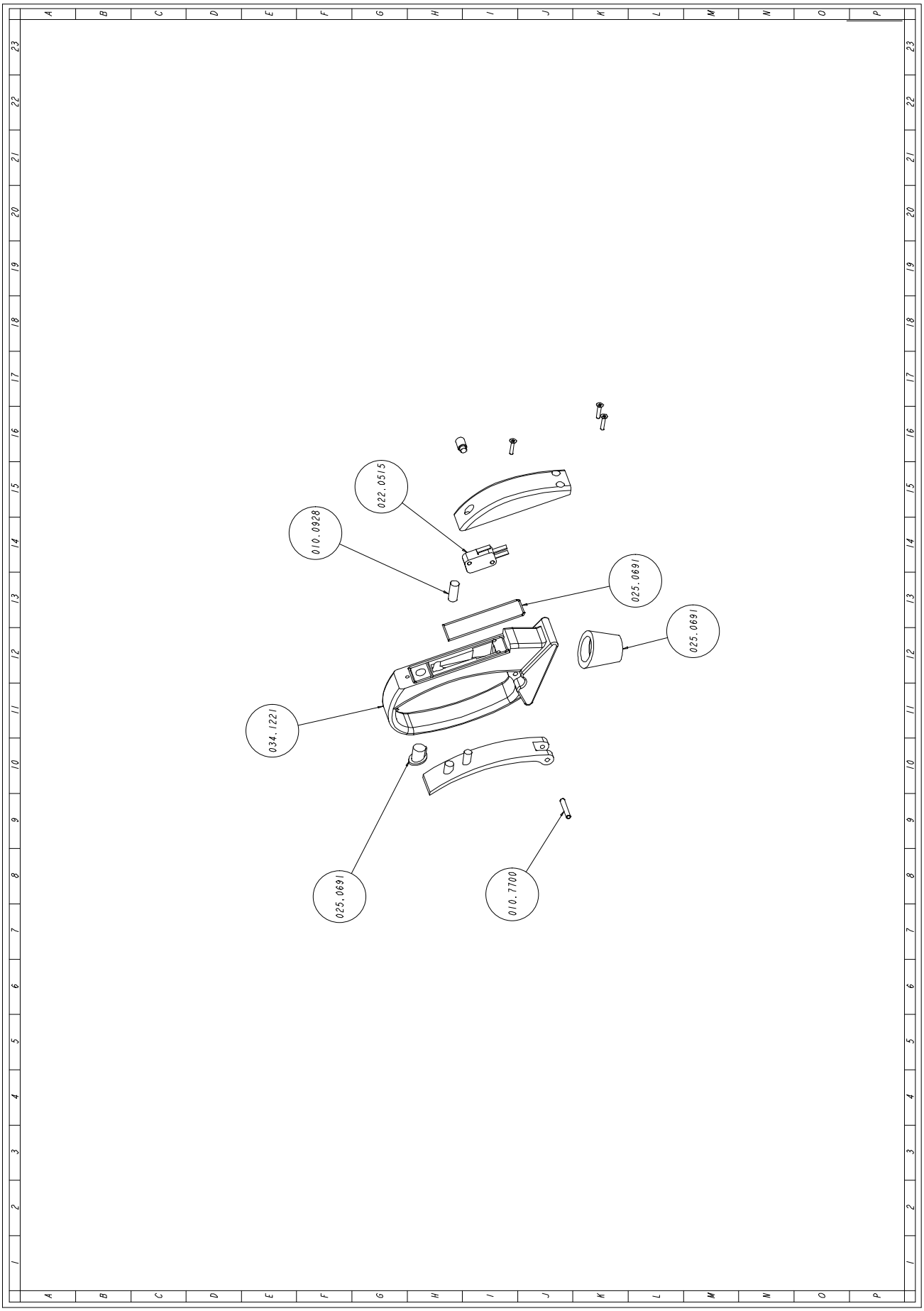
Code	Description	Description	Q.ty
001.4054	TRAVE ARCHETTO SH 382 N.T. MOD.	BOW BEAM SH 382 N.T. MOD.	1,000
010.7231	DADO AUTOBLOCCANTE M12	M12 SELF–LOCKING SCREW NUT	1,000
010.7606	RONDELLA 0 12	0 12 WASHER	1,000
010.7703	SPINA CILINDRICA DIAM. 8 X 30	CYLINDRICAL PIN DIAM. 8 X 30	1,000
010.7830	VITE BUTON 5 X 10	5 X 10 BUTON SCREW	1,000
010.8922	VITE TE 12 X 90	12 X90 TE SCREW	1,000
016.0956	COPERCHIO ARCHETTO N.T. SH 382	BOW COVER SH 382	1,000
016.3366	CARTER POSTERIORE TRAVE SH 382	REAR CARTER BEAM	1,000
019.5370	FASCETTA LEGRAND ART.31900 FIX. A VITE	LEGRAND CLAMP ART.31900	1,000
034.1107	VOLANTINO O 30 M6 X 20	O 30 M6 X 20 HANDWHEEL	2,000

Cylinder unit



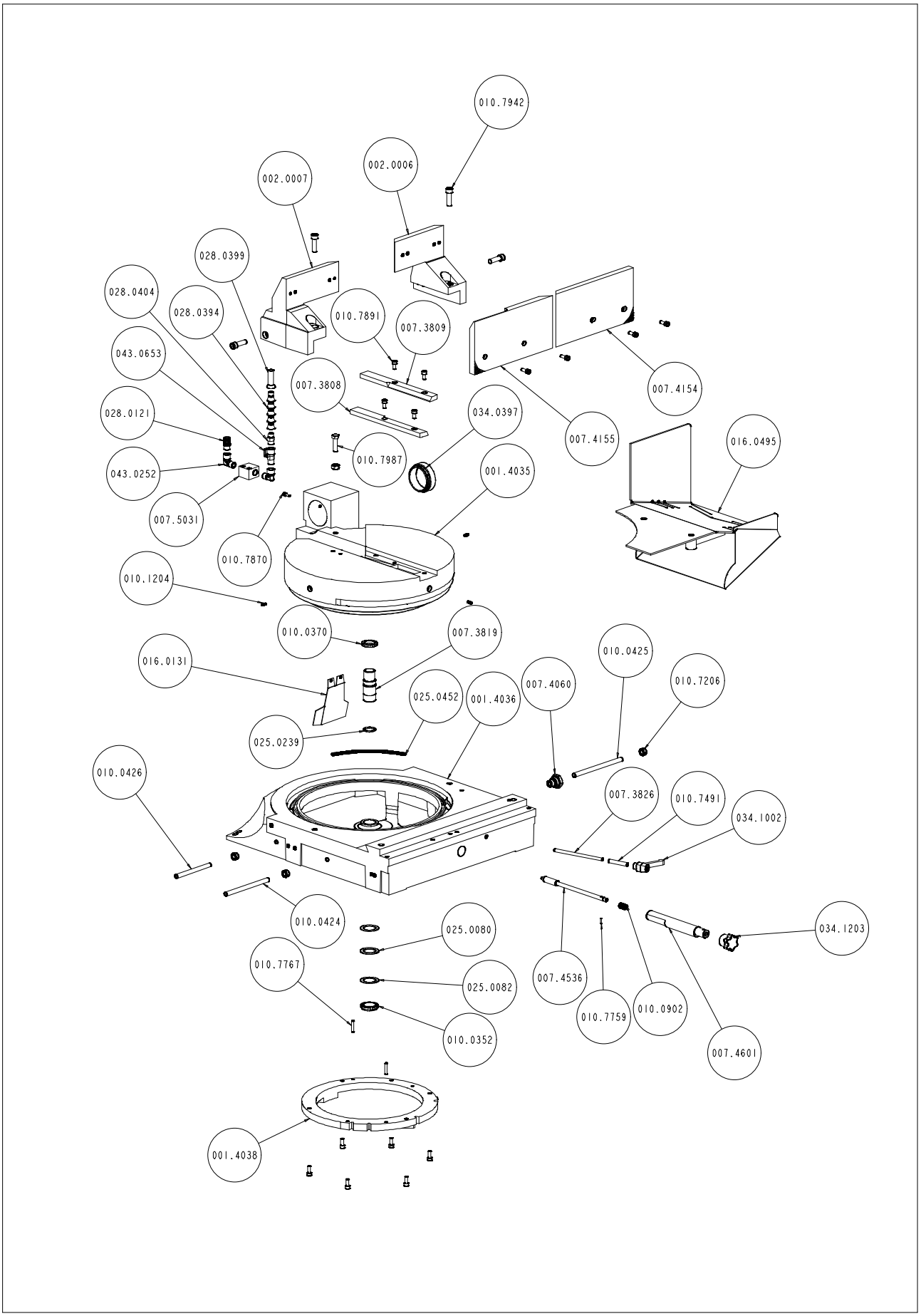
Code	Description	Description	Q.ty
007.3695	STAFFA AGGANCIO MOLLA E CILINDRO SH 332	SPRING AND CYLINDER COUPLING BRACKET	1,000
010.0331	VITE T.E. M10 X 180 TUTTO FILETTO	TE SCREW M10X180 SH 400	1,000
010.0933	MOLLA RICHIAMO TESTA	HEAD RETURN SPRING	1,000
010.1103	FORCELLA 16 X 1,5	16 X 1,5 FORK	1,000
010.1411	STAFFA SUPPORTO CILINDRO SH 332–382	CYLINDER SUPP. BRACKET SH 332–382	1,000
010.7603	RONDELLA 0 6	0 6 WASHER	2,000
010.7674	RONDELLA SPESSORE DIAM.10,5X30	THICKNESS WASHER DIAM. 10,5 X 30	1,000
010.7861	VITE TCEI 5 X 20	TCEI 5 X 20 SCREW	4,000
010.7868	VITE TCEI 6 X 12	TCEI 6 X 12 SCREW	2,000
016.0255	PROTEZIONE CILINDRO SH CNCFE	CYLINDER GUARD SH CNCFE	1,000
016.0296	STAFFA ESTERNA CILINDRO	OUTER CYLINDER BRACKET SH	1,000
016.1195	SCATOLA DI DERIVAZIONE	BOX FOR WIRING CONNECTION ON	1,000
019.3555	MOTORE FL57STH76–2804A–12 X CILINDRO	MOTOR F257STH76–2804 FOR CYLINDER	1,000
022.0046	POTENZIOMETRO 6639S–001–202	6639S–001–202 POTENTIOMETER	1,000
022.0209	RACCORDO RAPIDO SEM 29 ART.3800296	RAPID JOINT SEM 29	1,000
022.0211	RACCORDO RAPIDO SEM PG 13,5	RAPID JOINT SEM PG 13,5	4,000
022.0238	PRESSACAVO PG 7 BS01	CABLE PRESSER PG 7 BS01	2,000
022.0244	CONTRODADO 3217B GRIGIO PG 13,5	LOCK NUT 3217B GREY PG 13,5	1,000
022.0378	CONNETTORE V.1406 X BOBINA RAC VALVOLARIGENERATRICE	CONNECTOR F.REGENERATOR VALVE COIL	1,000
022.0615	BOBINA V24 RAC X VALVOLA RIGENERATRICECILINDRO	COIL FOR CYLINDER VALVE SH 310 SX	1,000
022.2702	DADO PG 7 BL01	NUT PG 7 BL01	1,000
025.0876	GIUNTO WA 6–6.35 MM.28 X CILINDRO	JOINT WA 6–6.35 M M.28 FOR CYLINDER	2,000
043.0340	RONDELLA RAME 13X19X1,5–1/4	COPPER WASHER 13X19X1,5–1/4	2,000
043.0474	SILENZIATORE IN OTTONE 1/4’	”1/4”” BRASS SILENCER”	1,000
043.5671	PROTEZIONE POTENZIOMETRO CILINDRO	GUARD F.CYLINDER POTENTIOMETER	1,000
043.5681	SUPPORTO POTENZIOMETRO CILINDRO	CYLINDER POTENTIOMETER SUPPORT	1,000
044.0501	NIPPLO NP 1/4 IDRAULICO	NP 1/4 HYDRAULIC NIPPLE	1,000
044.0505	NIPPLO 1/4 FORO 1 MM E.19X29 ZINC.G.	HYDRAULIC FITTING 19X19 1/4	1,000
044.1251	VALVOLA RIGENERATRICE CILINDRO	CYLINDER REGENERATING VALVE	1,000
044.1125	CILINDRO IDRAULICO 0 63 C.150+BYPASSENZA CONNETTORE	HYDRAULIC CYLINDER 0 63 C.	1,000

Handgrip



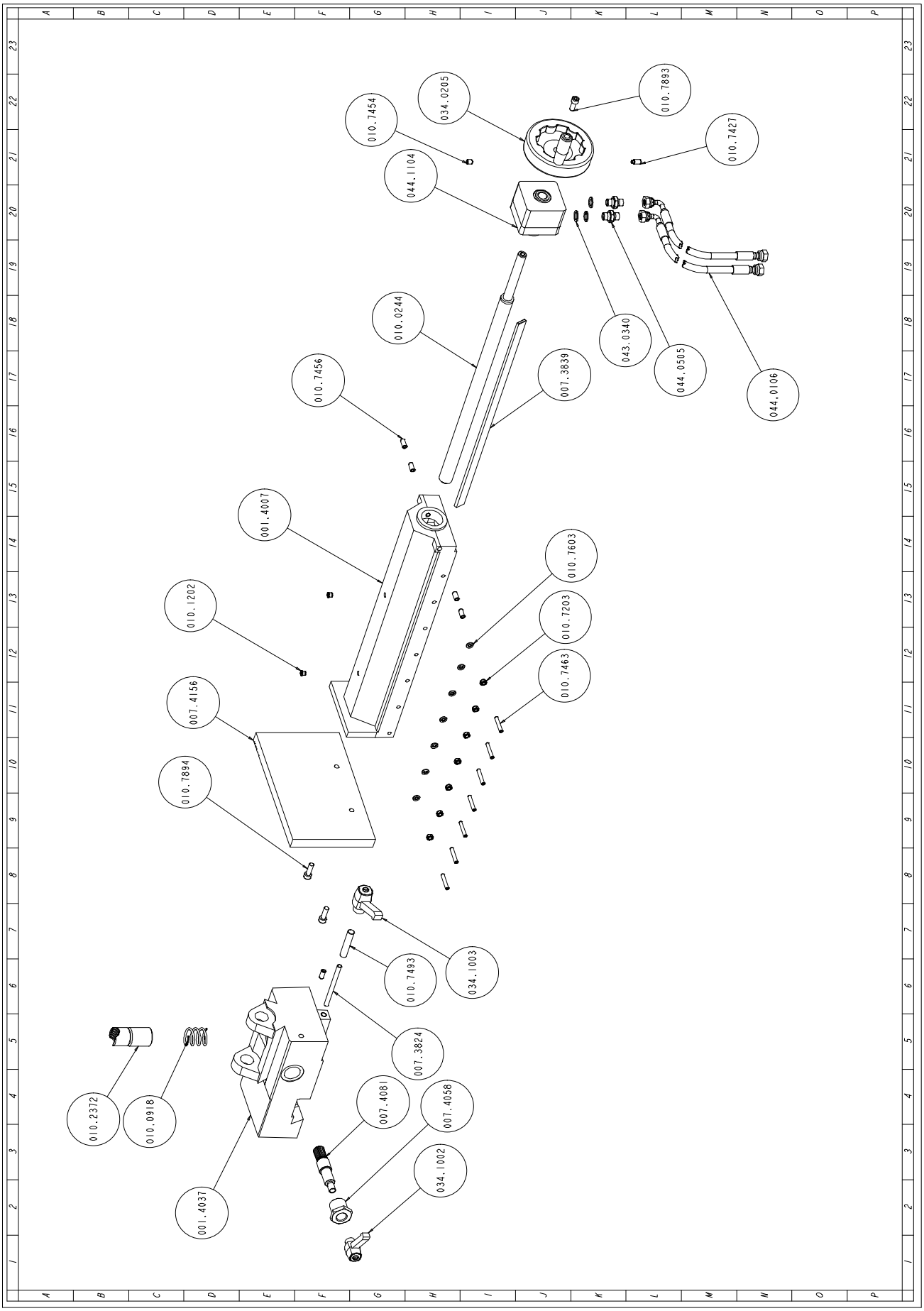
Code	Description	Description	Q.ty
010.0928	MOLLA X IMPUGNATURA MEP DIS.1189559	MEP HANDLE SPRING	1,000
010.7409	GRANO VCE PUNTA CILINDRICA 8 X 10	8 X 10 CYLIND.POINT VCE GRUB SCREW	1,000
010.7700	SPINA CILINDRICA DIAM. 4 X 24	CYLINDRICAL PIN DIAM. 4 X 24	1,000
010.7800	VITE AUTOFILETTANTE 2,9 X 15	2,9 X 15 SELF−THREADING SCREW	3,000
022.0515	MICROINTERRUTTORE V−16−1A6−R	MICROSWITCH V−16−1A6−R	1,000
025.0691	SERIE GUARNIZIONI X IMPUGNATURA MEP	GASKETS FOR MEP HANDLE	1,000
034.1221	IMPUGNATURA DISEGNO MEP	MEP HANDLE	1,000

Fixed work table and turntable



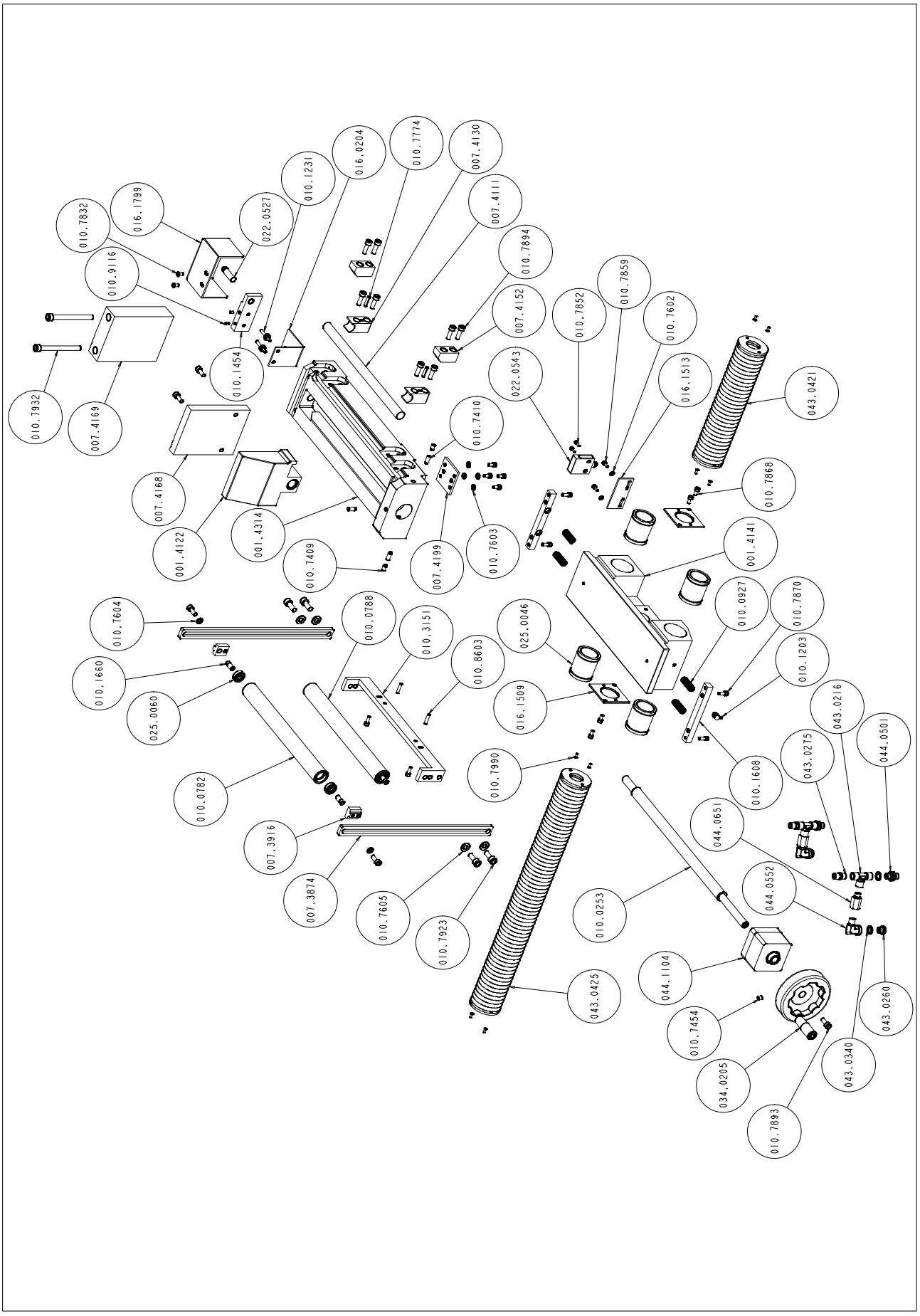
Code	Description	Description	Q.ty
002.0006	SQUADRO MORSA DESTRO MOD.1204	RIGHT VICE BACK STOP MOD.1204	1,000
002.0007	SQUADRO MORSA MOD.1205	LEFT VICE BAK STOP	1,000
001.4035	PIANO GIREVOLE SH 320 60¿– MOD. 1229	ROTATING TABLE SH 320 60¿ MOD.1229	1,000
001.4036	PIATTAFORMA FISSA SH 320 60¿–SH 332 M1201	FIXED PLATFORM SH 320 60¿ MOD.1201	1,000
001.4038	ANELLO PIANO GIREVOLE M1216	ROTATING TABLE RING M.1216	1,000
007.3808	PIASTRA APPOGGIA PEZZI SINISTRA SH 32060¿– SH 332	LEFT STOCK SUPPORT PLATE SH 320 60¿	1,000
007.3809	PIASTRA APPOGGIA PEZZI DESTRA SH 320 60¿– SH 332	RIGHT STOCK SUPPORT SH 320 60¿	1,000
007.3819	PERNO DI CENTRO SH 320 60¿–282–332	CENTRE PIN SH 320 60¿	1,000
007.3826	PERNO BLOCCAGGIO PIANO GIREVOLE SH 32060¿– SH 332	ROTATING TABLE LOCKING PIN SH 320 60¿	1,000
007.4060	BOCCOLA BATTUTA 45¿ DX SH 320 60¿SH 332	BUSHING F.STOP AT 45¿ RIGHT SH 320 60¿	1,000
007.4154	GANASCIA MORSA DESTRA	RIGHT VICE JAW	1,000
007.4155	GANASCIA MORSA SINISTRA	LEFT VICE JAW	1,000
007.4536	PERNO PUNTO FISSO	PIN SH 200	1,000
007.4601	CILINDR.PUNTO FISSO	FIXED POINT CYLINDER	1,000
007.5031	SQUADRETTO X LIQUIDO PIANO GIREVOLE	COOLANT PLATE	1,000
010.0352	GHIERA AUTOBLOCCANTE 35X1,5	SELF–LOCKING RING NUT 35X1,5	1,000
010.0370	GHIERA 5S 30X1,5	RING NUT 5S 30X1,5	1,000
010.0424	GRANO PUNTA PIANA 12X170	GRUB SCREW 12X170	1,000
010.0425	GRANO PUNTA PIANA 12X190	GRUB SCREW 12X190	1,000
010.0426	GRANO PUNTA PIANA 12X135	GRUB SCREW 12X135	1,000
010.0902	MOLLA PUNTO FISSO TESTA MOD. 95	HEAD FIXED POINT SPRING	1,000
010.1204	INGRASSATORE M 6	M 6 LUBRICATOR	3,000
010.7206	DADO M12	M12 SCREW NUT	4,000
010.7491	GRANO VCE PUNTA PIANA 10 X 60	10 X 60 FLAT POINT VCE GRUB SCREW	1,000
010.7759	SPINA ELASTICA DIAM. 3 X 16	ELASTIC PIN DIAM. 3 X 16	1,000
010.7767	SPINA ELASTICA DIAM. 6 X 35 A SPIRALE	ELASTIC PIN DIAM. 6 X 35	2,000
010.7870	VITE TCEI 6 X 16	TCEI 6 X 16 SCREW	1,000
010.7891	VITE TCEI 8 X 16	TCEI 8 X 16 SCREW	4,000
010.7942	VITE TCEI 12 X 40	TCEI 12 X 40 SCREW	4,000
010.7987	VITE TE 12 X 40	TE 12 X 40 SCREW	1,000
016.0131	CARTER TRUCIOLI PER PIANO GIREVOLE	ROTATING TABLE SWARF COVER	1,000
016.0495	GUIDA SCARICA PEZZI	BAR UNLOAD GUIDE	1,000
025.0080	GABBIA ASSIALE A RULLINI AXK 3552	AXIAL CAGE WITH ROLLERS AXK 3552	1,000
025.0082	RALLA AS 3552	CENTER PLATE AS 3552	2,000
025.0239	ANELLO DI TENUTA OR 4112	O RING 4112	1,000
025.0452	RULLI 6X6 AISI 420	ROLLERS 6X6 AISI 420	219,00
028.0121	RACCORDO 3/8–17 CL 2601	JOINT 3/8–17 CL 2601	1,000
028.0394	TUBO LOOC LINE 1/2 ART. 59861	LOOC LINE HOSE 1/2	1,000
028.0399	UGELLO 0 12,7 – 1/2 ART. 59863	NOZZLE 0 12,7 – 1/2	1,000
028.0404	RACCORDO 3/8 NPT LOOC LINE 1/2 ART.59864	FITTING 3/8 NPT	1,000
034.1002	LEVA A SCATTO 10 MA	LEVER 10 MA	1,000
034.1203	IMPUGNATURA NS. DISEGNO M10	MEP MADE HANDWHEEL M10	1,000
043.0252	GOMITO MF 3/8 CL 2020	MF 3/8 CL 2020 ELBOW	2,000
043.0653	RUBINETTO M/F 3/8 CL 6310	M/F 3/8 CL 6310 TAP	1,000
034.0397	COPERCHIO SNODO TESTA SH MM.30	HEAD PIVOT COVER SH N.S.	1,000

Vice assembly



Code	Description	Description	Q.ty
001.4007	SCORREVOLE MORSA MOD. 1207	UPPER VICE	1,000
001.4037	SUPPORTO MORSA SH 320 60¿–280–282 292–332 MOD.1206	VICE SUPPORT SH 320 60¿–280 MOD.1206	1,000
007.3824	PERNO BLOCCAGGIO MORSA SERRAGGIO RAPIDO	LOCKING PIN	1,000
007.3839	LARDONE MORSA	VICE GIB	1,000
007.4058	BOCCOLA ECCENTRICA	ECCENTRIC BUSHING	1,000
007.4081	PIGNONE SBLOCCAGGIO SCORREVOLE	UNLOCKING LOWER VICE PINION	1,000
007.4156	GANASCIA MORSA MOBILE SH 332	MOVING VICE JAW SH 332	1,000
010.0244	VITE MORSA 576X24 D.0696–08	VICE SCREW 576X24	1,000
010.0918	MOLLA RICHIAMO CHIOCCIOLA VITE MORSA	VICE SCREW NUT RETURN SPRING	1,000
010.1202	OLIATORE A SFERA DIAM. 8	OIL FILLER DIAM.8	2,000
010.2372	CHIOCCIOLA BRONZO 45¿	SCREW NUT 45¿	1,000
010.7203	DADO M6	M6 SCREW NUT	7,000
010.7427	GRANO VCE PUNTA CILINDRICA 8 X 12	8 X 12 CYLIND.POINT VCE GRUB SCREW	1,000
010.7454	GRANO VCE PUNTA CONICA 8 X 8	8 X 8 CONICAL POINT VCE GRUB SCREW	1,000
010.7456	GRANO VCE PUNTA CONICA 8 X 16	8 X 16 CONICAL POINT VCE GRUB SC-REW	5,000
010.7463	GRANO VCE PUNTA CONICA 6 X 35	6 X 35 CONICAL POINT VCE GRUB SC-REW	7,000
010.7493	GRANO VCE PUNTA PIANA 12 X 60	12 X 60 FLAT POINT VCE GRUB SCREW	1,000
010.7603	RONDELLA 0 6	0 6 WASHER	7,000
010.7859	VITE TCEI 5 X 12	TCEI 5 X 12 SCREW	4,000
010.7893	VITE TCEI 8 X 20	TCEI 8 X 20 SCREW	1,000
010.7894	VITE TCEI 8 X 25	TCEI 8 X 25 SCREW	6,000
025.0203	ANELLO TENUTA	SEAL 35X25X7	2,000
025.0217	ANELLO TENUTA OR 155–50,80	O RING 155–50,80	1,000
025.0452	RULLI 6X6 AISI 420	ROLLERS 6X6 AISI 420	1,000
034.0205	VOLANTINO VPRA/125 MR	VPRA/125 HANDWHEEL	1,000
034.1002	LEVA A SCATTO 10 MA	LEVER 10 MA	1,000
034.1003	LEVA A SCATTO 12 MA	LEVER 12 MA	1,000
043.0340	RONDELLA RAME 13X19X1,5–1/4	COPPER WASHER 13X19X1,5–1/4	3,000
044.0106	TUBO CENTRALINA IDRAULICA 1500 MM R7 1/41X90¿	HYDR.UNIT HOSE R7 1/14 MM 1500 1X90¿	2,000
044.0505	NIPPLO 1/4 FORO 1 MM E.19X29 ZINC.G.	HYDRAULIC FITTING 19X19 1/4	2,000
044.1104	CILINDRO VOLAMPRESS D.E.SH 330 N.T.	HYDRAULIC CYLINDER SH 330 N.T.	1,000

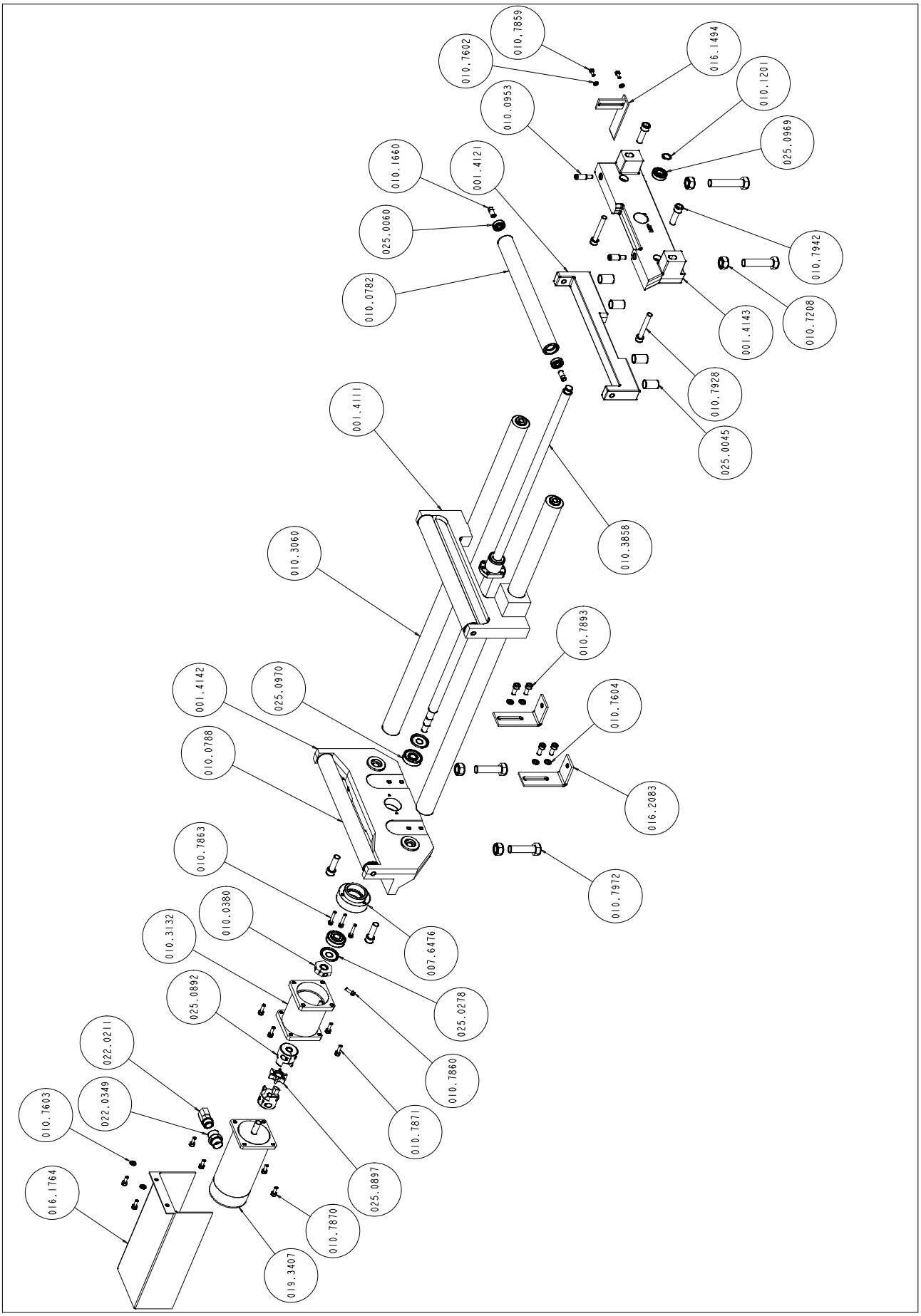
Feed carriage unit



Code	Description	Description	Q.ty
001.4122	CHIOCCIOLA ALIMENTATORE MORSE VERT. M.1268	SCREW NUT	1,000
001.4141	CARRELLO ALIMENTATORE MOD.1262	FEEDER CARRIAGE MOD.1262	1,000
001.4314	MORSA ALIMENTATORE SH 330 CNC 60¿ – 281–282 NC EVO	FEEDER VICE SH 330 CNC 60¿	1,000
007.3874	SUPPORTO RULLO PREMIBARRA	ROLLER SUPPORT	2,000
007.3916	TASSELLO FISSAGGIO RULLO SUPPLEMENTA-RE	ADD. ROLLER FIXING PLATE	2,000
007.4111	RULLO SUPPLEMENTARE ALIMENTATORE	FEEDER ADDITIONAL ROLLER	1,000
007.4130	SUPPORTO X RULLO SUPPL.MORSA ALIM.	SUPPORT FOR FEEDER ADDITIONAL ROLLER	2,000
007.4168	GANASCIA MORSA MOBILE ALIMENTATORE	FEEDER MOVABLE VICE JAW	1,000
007.4169	GANASCIA MORSA FISSA ALIMENTATORE SH 332AX–AXI–CNC–SH 330 AXIS/NC–EVO M.VERT.IDR	”ADD.JAW F.BUNDLE CUTTING SH 330 ””C”””	1,000
007.4199	PIASTRINO FISSAGGIO SCORREVOLE MORSA ALIMENTATORE SH 330	UPPER VICE FIXING PLATE SH 330	1,000
007.4152	TASSELLO ANTICADUTA RULLO SH 330 60	ROLLER ANTIFALLING FIX.PLATE SH 330 60¿	2,000
010.0253	VITE MORSA ALIMENTATORE 567X24 SHFILET-TO SINISTRO D.039522	VICE SCREW 567X24 SH L.THREAD	1,000
010.0782	CORPO RULLO ALIMENTATORE 0 35	0 35 FEEDER ROLLER	2,000
010.0788	RULLO ALIMENTATORE COMPLETO X SH. 0 35 L	COMPLETE ROLLER 0 35	2,000
010.0927	MOLLA CARRELLO ALIMENTATORE CNCFE	FEEDER CARRIAGE SPRING CNCFE	4,000
010.1203	OLIATORE A 90¿ 6X1	90¿ OIL FILLER DIAM.8 6X1	1,000
010.1231	VITE FISSAGGIO STAFFA FINECORSA ALI MENTATORE SH AX–AXI–AXI S	FIXING SCREW SH AX–AXI–AXI S	2,000
010.1454	STAFFA FISSAGGIO FINE CORSA ALIMEN– TA-TORE SHARK NC	FEEDER BACK STOP BRACKET SH NC	1,000
010.1608	TASSELLO MORSA BASCULANTE ALIMENTA-TORE 330	FEEDER VICE FIX PLATE 330	2,000
010.1660	PERNO RULLO 25 MM.ALIMENT.SH	PIN FOR FEEDER ROLLER SH 320 AXI	4,000
010.3151	SUPPORTO RULLO MORSA ALIMENTATORE SH 330AXIS	FEEDER VICE ROLLER SUPPORT SH330AXIS	1,000
010.7409	GRANO VCE PUNTA CILINDRICA 8 X 10	8 X 10 CYLIND.POINT VCE GRUB SCREW	2,000
010.7410	GRANO VCE PUNTA CILINDRICA 8X16	8 X 16 CYLIND.POINT VCE GRUB SCREW	3,000
010.7454	GRANO VCE PUNTA CONICA 8 X 8	8 X 8 CONICAL POINT VCE GRUB SCREW	1,000
010.7602	RONDELLA 0 5	0 5 WASHER	2,000
010.7603	RONDELLA 0 6	0 6 WASHER	4,000
010.7604	RONDELLA 0 8	0 8 WASHER	2,000
010.7605	RONDELLA 0 10	0 10 WASHER	4,000
010.7774	SPINA ELASTICA DIAM. 6 X 26	ELASTIC PIN DIAM. 6 X 26	2,000
010.7832	VITE BUTON 6 X 12	BUTON SCREW 6 X 12	2,000
010.7852	VITE TCEI 4 X 12	TCEI 4 X 12 SCREW	2,000
010.7859	VITE TCEI 5 X 12	TCEI 5 X 12 SCREW	6,000
010.7868	VITE TCEI 6 X 12	TCEI 6 X 12 SCREW	8,000
010.7870	VITE TCEI 6 X 16	TCEI 6 X 16 SCREW	6,000
010.7893	VITE TCEI 8 X 20	TCEI 8 X 20 SCREW	5,000
010.7894	VITE TCEI 8 X 25	TCEI 8 X 25 SCREW	12,000
010.7923	VITE TCEI 10 X 25	TCEI 10 X 25 SCREW	4,000
010.7932	VITE TCEI 10 X 110	TCEI 10 X 110 SCREW	2,000
010.7990	VITE TSPEI 4 X 8	TSPEI 4 X 8 SCREW	8,000
010.8603	SPINA CILINDRICA DIAM. 6 X 25	PARALLEL PIN DIAM.6 X 25	2,000
010.9116	GRANO VCE PUNTA PIANA 5 X 8	5X8 FLAT POINT GRUB SCREW	2,000
016.0204	SUPPORTO CATENA ALIMENTATORE	FEEDER CHAIN SUPPORT	1,000
016.1509	STAFFA FIX SOFFIETTO CIRCOLARE	CIRCULAR BELLOWS FIX BRACKET	2,000
016.1513	STAFFA FIX FINECORSA DI AZZERAMENTO	MICROSW.FIX.BRACKET	1,000
016.1799	PROTEZIONE FINE CORSA ALIMENTATORE	FEEDER BACK STOP PRTECTION	1,000
022.0543	FINECORSA ALIMENTATORE	LIMIT SWITCH FEEDER	1,000
022.0527	SENSORE DI PROSSIMITA’ PNP–NO (M12X1–27MM.)X ALIMENT.	PROXIMITY PNP–NO (M12X1–27)	1,000

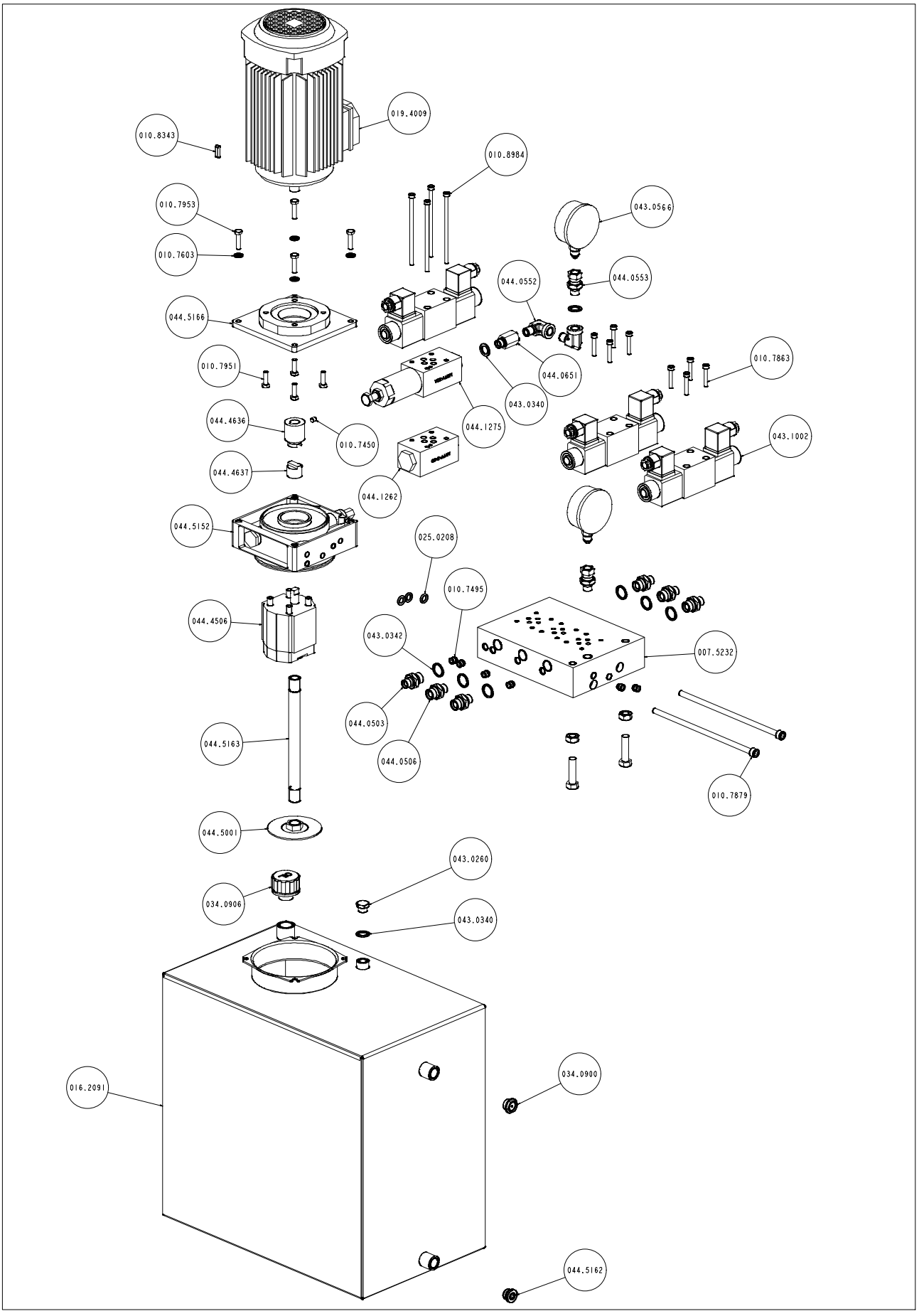
Code	Description	Description	Q.ty
025.0046	MANICOTTO A SFERA 0658.040.00 AL.	BALL SLEEVE 0658.040.00 AL.	4,000
025.0060	CUSCINETTO 6000 2Z	BEARING 6000 2Z	4,000
025.0203	ANELLO TENUTA 35X25X7	SEAL 35X25X7	2,000
025.0217	ANELLO TENUTA OR 155–50,80	O RING 155–50,80	1,000
025.0452	RULLI 6X6 AISI 420	ROLLERS 6X6 AISI 420	1,000
034.0205	VOLANTINO VPRA/125 MR	VPRA/125 HANDWHEEL	1,000
043.0216	RACCORDO A –T– FFF 1/4 CL 2003	FFF 1/4 CL 2003 T JOINT	2,000
043.0260	TAPPO TTE4 1/4 – CL 2611	1/4 TAP TTE4	2,000
043.0275	NIPPLO CONICO A2–1/4 – CL 2500	A2–1/4 – CL 2500 CONICAL NIPPLE	2,000
043.0340	RONDELLA RAME 13X19X1,5–1/4	COPPER WASHER 13X19X1,5–1/4	4,000
043.0421	SOFFIETTO CIRCOLARE X ALIMENTATOREAZ/ ZD=550/60 SPIRE 37	FEEDER CIRCULAR BELLOWS	2,000
043.0425	SOFFIETTO CIRCOLARE X ALIMENTATORESH NC–EVO N.T. AZ/ZD=610/65 SPIRE 41	CIRCULAR BELLOWS MM610	2,000
044.0501	NIPPLO NP 1/4 IDRAULICO	NP 1/4 HYDRAULIC NIPPLE	2,000
044.0552	RACCORDO A GOMITO IDRAULICO MF 1/4 AL-TAPRESSIONE	HYDR. ELBOW JOINT M/F 1/4 HIGH PRES-SURE	2,000
044.0651	PROLUNGA 1/4’ M.F. ESAGONALE 25MM.	”1/4”” M.F. EXTENSION 20 MM”	2,000
044.1104	CILINDRO VOLAMPRESS D.E.SH 330 N.T.SH 292–SH 332	HYDRAULIC CYLINDER SH 330 N.T.	1,000

Feed vice slide unit



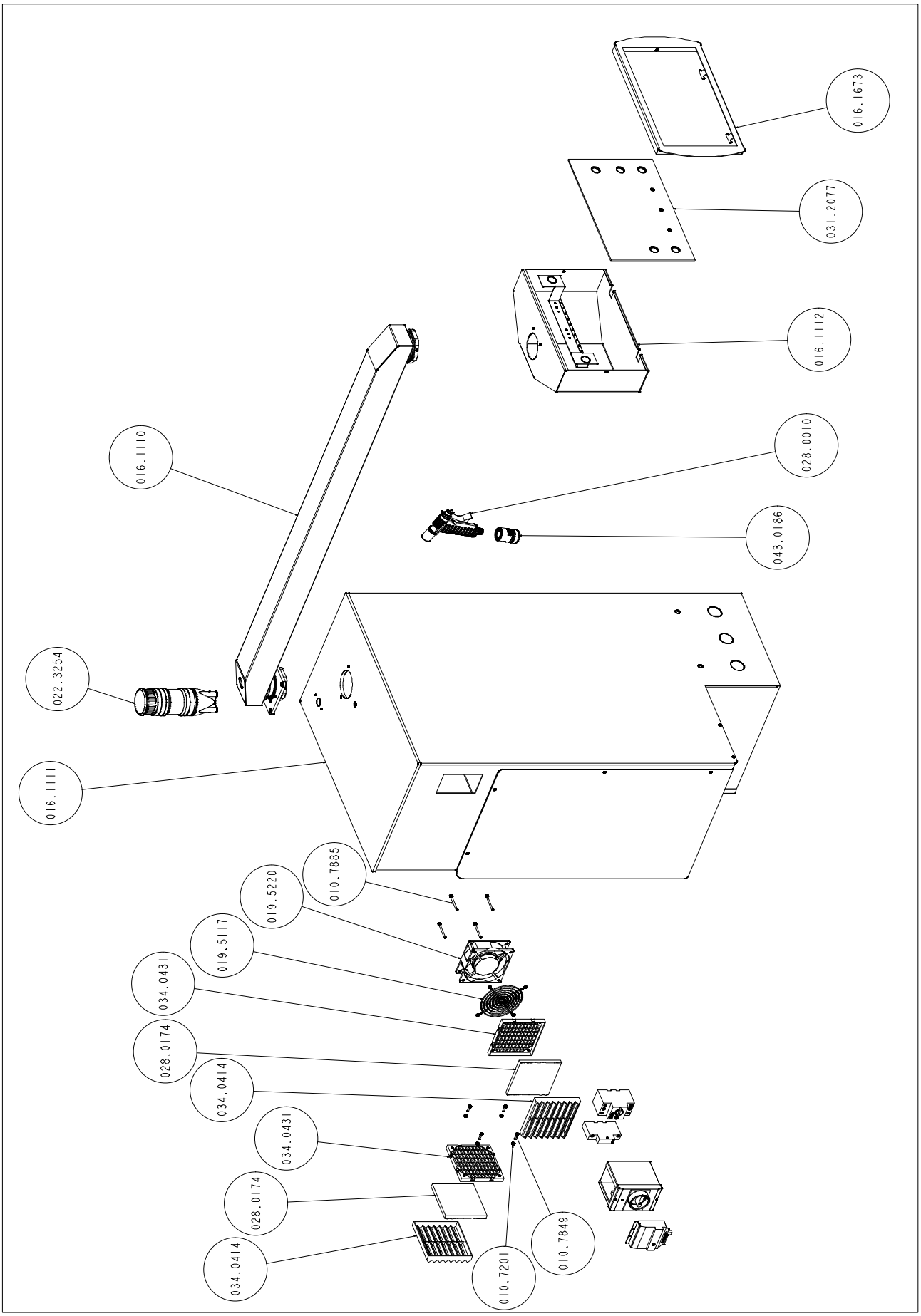
Code	Description	Description	Q.ty
001.4111	SUPPORTO RULLO LIBERO ALIMENTATORE SHARKMOD. 1263	ROLLER SUPPORT SHARK MOD.1263	1,000
001.4121	STAFFA ANTERIORE PARTE SUPERIORE ALIMENTAT0RE SH 320 MOD. 1267	UPPER FRONT BRACKET SH 320 MOD.1267	1,000
001.4142	STAFFA POSTERIORE ALIMENTATORE SHARK NC– EVO MOD. 1402	FEEDER REAR BRACKET SH NC EVO MOD.1402	1,000
001.4143	STAFFA ANTERIORE INFERIORE ALIMENTA TORESHARK 281–282–332 MOD.1266	FEEDER LOW FRONT BRACKET SH281–282–332	1,000
007.6476	MANICOTTO VITE RICIRCOLO ALIMENTATORE-SH 500–420	SLEEVE FOR RECIRCULATING BALLSCREW	1,000
010.0380	GHIERA FISSAGGIO VITE RICIRCOLO ALIMENTATORE SH N.T.	FIXING RING NUT FOR FEEDER	1,000
010.0782	CORPO RULLO ALIMENTATORE 0 35	0 35 FEEDER ROLLER	3,000
010.0788	RULLO ALIMENTATORE COMPLETO X SH. 0 35 L	COMPLETE ROLLER 0 35	3,000
010.0953	PERNO DI CENTRAGGIO TESTATA ANTERIO RE ALIMENTATORE SH 320	CENTERING PIN SH 320	2,000
010.1201	VITERIA E BULLONERIA	SCREWS AND BOLTS	1,000
010.1660	PERNO RULLO 25 MM.ALIMENT.SH	PIN FOR FEEDER ROLLER SH 320 AXI	6,000
010.3060	GUIDA CARRELLO ALIMENTATORE 0 40 MM. 970X SHARK NC N.T.	FEEDER CARRIAGE GUIDE 0 40 MM.970 SH NC	2,000
010.3132	SUPPORTO MOTORE P/P ALIMENT.SH NC	SUPPORT FOR FEEDER STEPPER MOTOR SH NC	1,000
010.3858	VITE A RIC. DI SFERE SDA2010VZS–3CCGS–1077 L–CT7 + CHIOCCIOLA	FEEDER SCREW + SCREW NUT ASSEMBLED	1,000
010.7208	DADO M16	M16 SCREW NUT	4,000
010.7450	GRANO VCE PUNTA CONICA 6 X 6	6 X 6 CYLINDRICAL POINT VCE GRUB	1,000
010.7602	RONDELLA 0 5	0 5 WASHER	2,000
010.7603	RONDELLA 0 6	0 6 WASHER	2,000
010.7604	RONDELLA 0 8	0 8 WASHER	4,000
010.7859	VITE TCEI 5 X 12	TCEI 5 X 12 SCREW	2,000
010.7863	VITE TCEI 5 X 30	TCEI 5 X 30 SCREW	3,000
010.7870	VITE TCEI 6 X 16	TCEI 6 X 16 SCREW	6,000
010.7871	VITE TCEI 6 X 20	TCEI 6 X 20 SCREW	4,000
010.7893	VITE TCEI 8 X 20	TCEI 8 X 20 SCREW	4,000
010.7928	VITE TCEI 10 X 70	TCEI 10 X 70 SCREW	2,000
010.7942	VITE TCEI 12 X 40	TCEI 12 X 40 SCREW	4,000
010.7972	VITE TE 16X60	TE 16 X 60 SCREW	2,000
016.1507	STAFFA COMANDO MICROINTERRUTTORE	MICROSWITCH BRACKET	1,000
016.1764	PROTEZIONE MOTORE ALIMENT. SH 500	FEEDER MOTOR PROTETION SH 500	1,000
016.2083	STAFFA FIX ALIMENTATORE	FEEDER FIX. BRACKET	2,000
019.3407	MOTORE P/P FL86STH156–5708AL XALIMENTATORI NC	FEEDINGMOTOR	1,000
025.0045	MANICOTTO A RICIRCOLO DI SFERE LBBS12–2L	RECIRCULATING BALL SLEEVE LBBS12–2LS	4,000
025.0060	CUSCINETTO 6000 2Z	BEARING 6000 2Z	6,000
025.0278	ANELLO DI PROTEZIONE NILOS 30302 AV	NILOS SEAL RING 30302 AV	2,000
025.0892	MOZZO 1A RTX 19 AL–H–12–2.0 ART. 1305050	HUB	2,000
025.0897	STELLA RTX 19–98 GS ART. 13051500120	RTX STAR	1,000
025.0969	CUSCINETTO 6002J2	BEARING	1,000
025.0970	CUSCINETTO 30302J2	BEARING	2,000

Hydraulic control unit



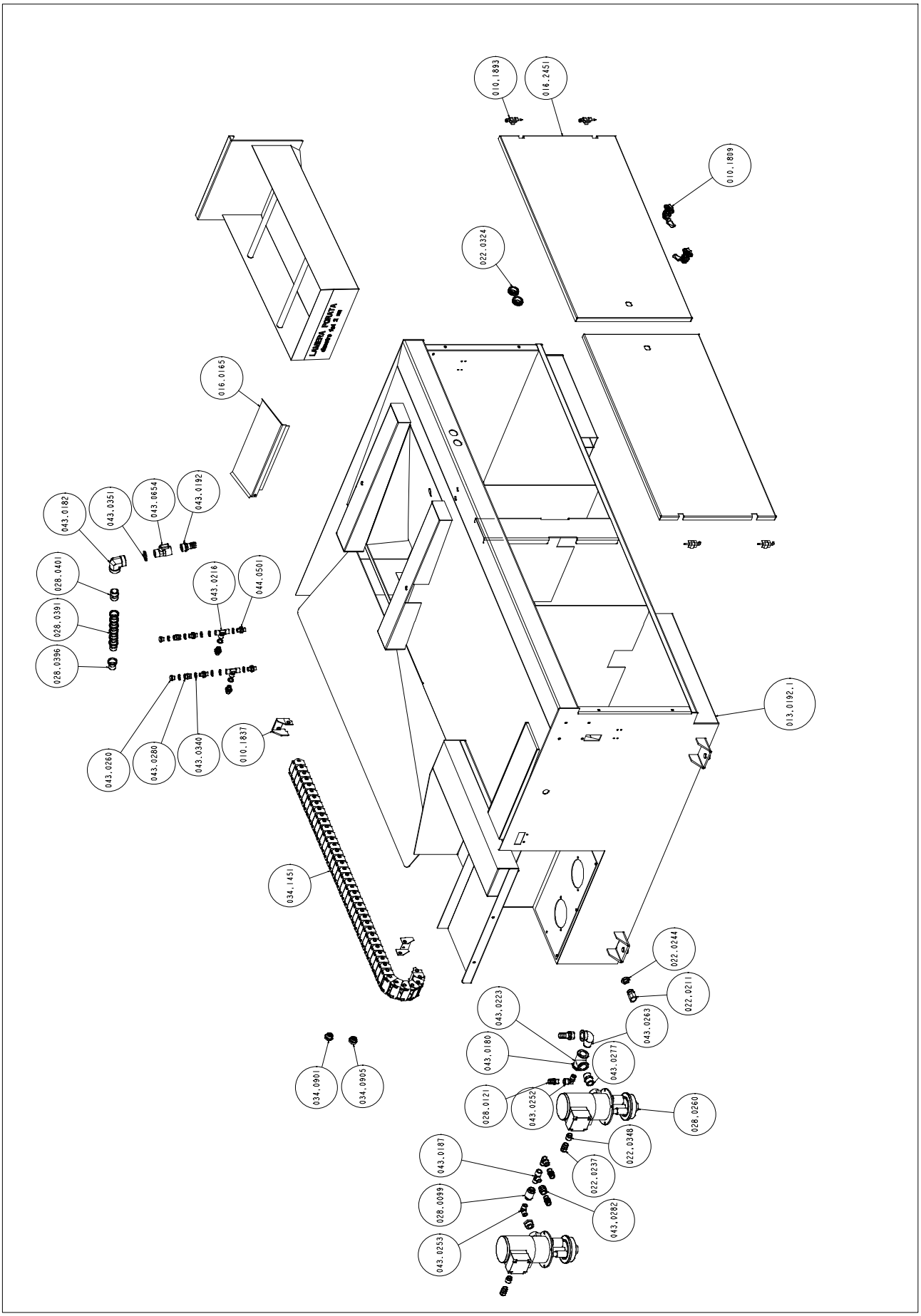
Code	Description	Description	Q.ty
007.5232	BLOCCHETTO IDRAULICO CENTRALINA SHNC–EVO ––A––	MANIFOLD	1,000
010.7450	GRANO VCE PUNTA CONICA 6 X 6	6 X 6 CYLINDRICAL POINT VCE GRUB	1,000
010.7495	GRANO VCE PUNTA PIANA 1/8 GAS	1/8”X9 FLAT POINT VCE GRUB SCREW	1,000
010.7603	RONDELLA 0 6	0 6 WASHER	1,000
010.7879	VITE TCEI M8 X 205	TCEI 8 X 205 SCREW	1,000
010.7863	VITE TCEI 5 X 30	TCEI 5 X 30 SCREW	1,000
010.7951	VITE TE 6 X 20	TE 6 X 20 SCREW	1,000
010.7953	VITE TE 6 X 25	TE 6 X 25 SCREW	1,000
010.8343	CHIAVETTA 5 X 5 X 20	KEY 5 X 5 X 20	1,000
010.8984	VITE TCEI 5 X 110	TCEI 5 X 110	1,000
016.2091	SERBATOIO CENTRALINA NC–EVO ––A––	UNIT TANK NC–EVO ––A––	1,000
019.4009	MOTORE CENTRAL. KW 0,736 C80 4P B14V.230–400–415.50/240–480.60 CERT.UL–CSA	MOTOR KW 0,736 C80 4P B14 CERT.UL–CSA	1,000
025.0208	ANELLO TENUTA OR 109–9,13	O RING 109–9,13	1,000
034.0900	TAPPO LIVELLO OLIO SLNT 38 3/8 PH 211 –POS. 210	SLNT 38 3/8 OIL LEVEL CAP	1,000
034.0906	TAPPO OLIO CENTRALINA IDRAULICA SH 310 SXI	HYDRAULIC UNIT OIL CAP SH 310 SXI	1,000
043.0260	TAPPO TTE4 1/4 – CL 2611	1/4 TAP TTE4	1,000
043.0340	RONDELLA RAME 13X19X1,5–1/4	COPPER WASHER 13X19X1,5–1/4	7,000
043.0342	RONDELLA RAME 17X23X1,5–3/8	COPPER WASHER 17X23X1,5–3/8	1,000
043.0566	MANOMETRO 0 63 0–100 BAR ATTACCO RADIALE	MANOMETER 0 63 0–100	1,000
043.1002	ELETTROVALVOLA DL3–S1/10N–D24K1 CON-BOBINA X CENTRALINA SXI–EVO–NC EVO	ELECTROVALVE FOR HYDRAULIC UNIT SXI EVO	3,000
044.0503	NIPPLO IDRAULICO M 3/8–M 1/4	HYDRAULIC FITTING M 3/8 M 1/4	6,000
044.0506	NIPPLO 3/8 1/4 FORO 1MM E.22X32,5 ZINC.G	NIPPLE 3/8 1/4 E.22X32,5 ZINC.G.	1,000
044.0552	RACCORDO A GOMITO IDRAULICO MF 1/4 ALTA	HYDR. ELBOW JOINT M/F 1/4 HIGH PRESSURE	1,000
044.0553	RACCORDO IDRAULICO MF 1/4 GIREVOLE XMANOMETRO CENTRALINA	HYDRAULIC COUPLING FOR POWER PACK MANOM.	1,000
044.0651	PROLUNGA 1/4’ M.F. ESAGONALE 25MM.	”1/4”” M.F. EXTENSION 20 MM”	1,000
044.1262	VALVOLA MODULARE DI BLOCCO SH SXI / NC	STOP VALVE FOR SH SXI / NC EVO	1,000
044.1275	VALVOLA MODULARE RIDUTTRICE DI PRESSIONE	MODULER VALVE PRESS.REDUC. MBRV–02A	1,000
044.4506	POMPA IDRAULICA MONOCENTRALINA CC 5	HYDR.PUMP FOR HYDR.UNIT CC 5 X NC–EVO	1,000
044.4636	GIUNTO COLLEGAMENTO LATO MOTORE GR 80X MONOCENTRALINA SH NC–EVO ––A––	CONNECTING COUPLING FOR CENTRAL UNIT	1,000
044.4637	GIUNTO COLLEGAMENTO LATO POMPA X MONOCENTRALINA	PUMP CONNECTING COUPLING FOR CENTRALUNIT	1,000
044.5001	FILTRO OLIO X CENTRALINA IDRAULICA	OIL FILTER FOR HYDRAULIC UNIT	1,000
044.5152	COLLETTORE PER POMPA DA 5 X NC–CNCC-TR UP100K3P0–01 5 MOD.6/021N7	SQUARE FOR PUMP SUPPORT	1,000
044.5162	TAPPO SCARICO OLIO –A–AN 612 – 3/8 OR	OIL DRAIN TAP –A– AN 612 – 3/8 OR”	1,000
044.5163	ASTA PESCANTE X MONOCENTRALINA NC–EVO––A–– L200 2X3/8 GAS	MONOUNIT SUCTION ROD NC–EVOA L200 2X3/8	1,000
044.5166	FLANGIA MONOCENTRALINA NC–EVO X MOTOREC80B14 ––A––	POWER PACK MOTOR FLANGE	1,000

Control panel



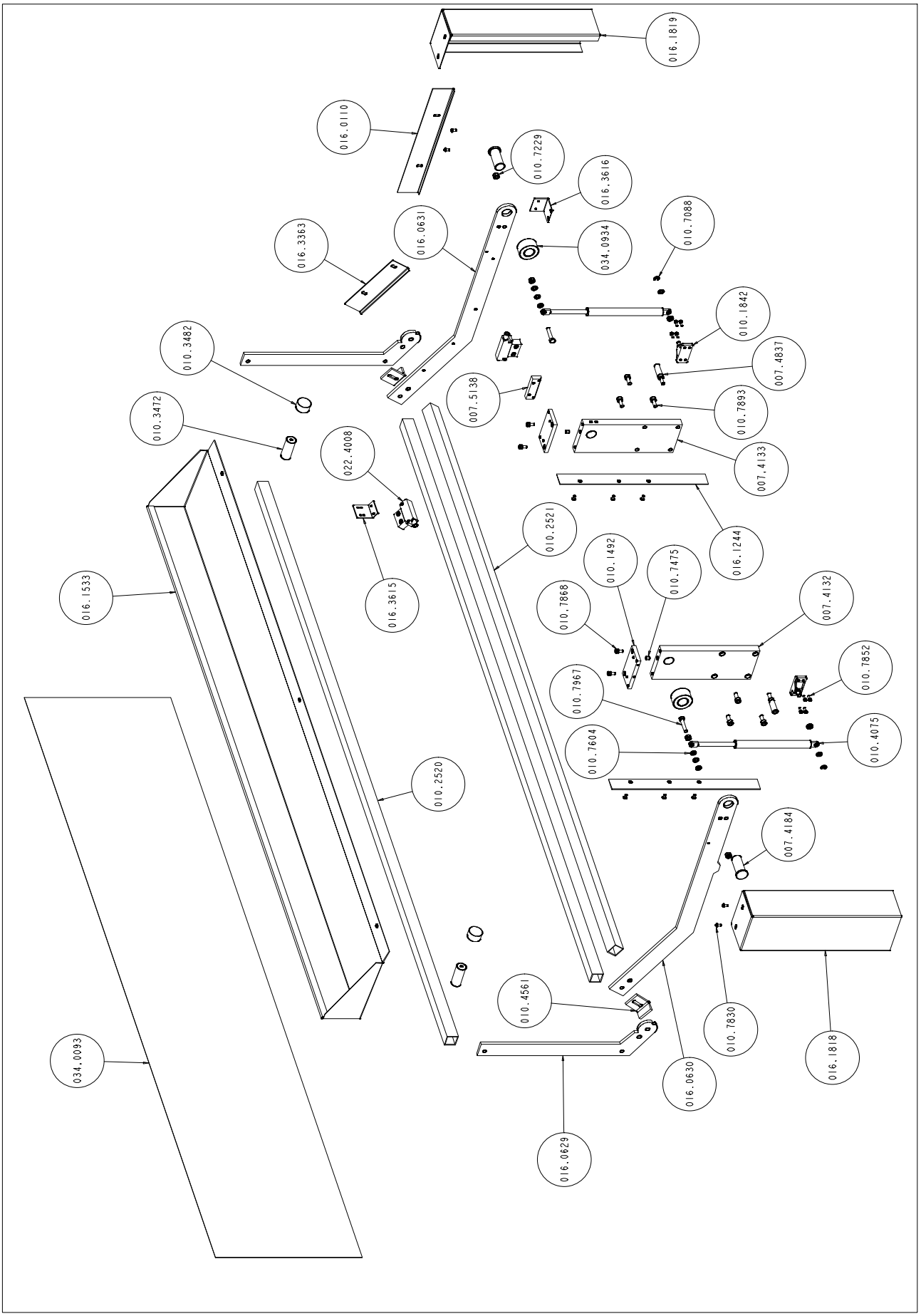
Code	Description	Description	Q.ty
010.7201	DADO M4	M4 SCREW NUT	1.000
010.7849	VITE TCEI 4 X 16	TCEI 4 X 16 SCREW	1.000
010.7885	VITE TCEI 4 X 50	TCEI 4 X 50 SCREW	1.000
016.1110	ASTA MOBILE X CONSOLE COMPLETA DI GIUNTO	MOBILE ROD FOR CONSOLE COMPLETE WITH JOINT	1.000
016.1111	ARMADIO ELETTRICO SH281–282–330–332NC5.0	ELECTRIC CABINET	1.000
016.1112	SCATOLA QUADRO COMANDI SENZA CORNICE	CONTROL PANEL BOX WITHOUT FRAME	1.000
016.1673	CORNICE QUADRO COMANDI X NC 5.0	FRAME FOR CONTROL PANEL	1.000
019.5117	COPRIVENTOLA X CNCFE	FAN COVER CNCFE	1.000
019.5220	VENTOLA 120X120 24 VDC FP–108	NYLON FAN 120X120 24 VDC FP–108	1.000
022.3254	LAMPEGGIANTE LED 24	FLASHING LED LIGHT 24	1.000
028.0010	PISTOLA SH–TI	COOLANT PISTOL	1.000
028.0174	FILTRO M12R X VENTOLA CNCFE	FAN FILTER M12R CNCFE	2.000
031.2077	CONSOLLE DI PROGRAMMAZIONE MEP 50 TOUCH–SCREEN 7 INCH X NC EVO – SH 230 NC HS	PROGRAMMING CONSOLLE MEP50 TS 7INCH NC	1.000
034.0414	COPERCHIO PORTA FILTRO A12C–7032 AX–CNC	A12C–7032 FINNER COVER AX–CNCFE	2.000
034.0431	BASE A12B – 7032 AX–CNCFE	A12B – 7032 BASE AX–CNCFE	2.000
043.0186	RACCORDO FEMMINA 1/2 ACQUASTOP	1/2 WATERASTOP FEMALE JOINT	1.000

Base assembly



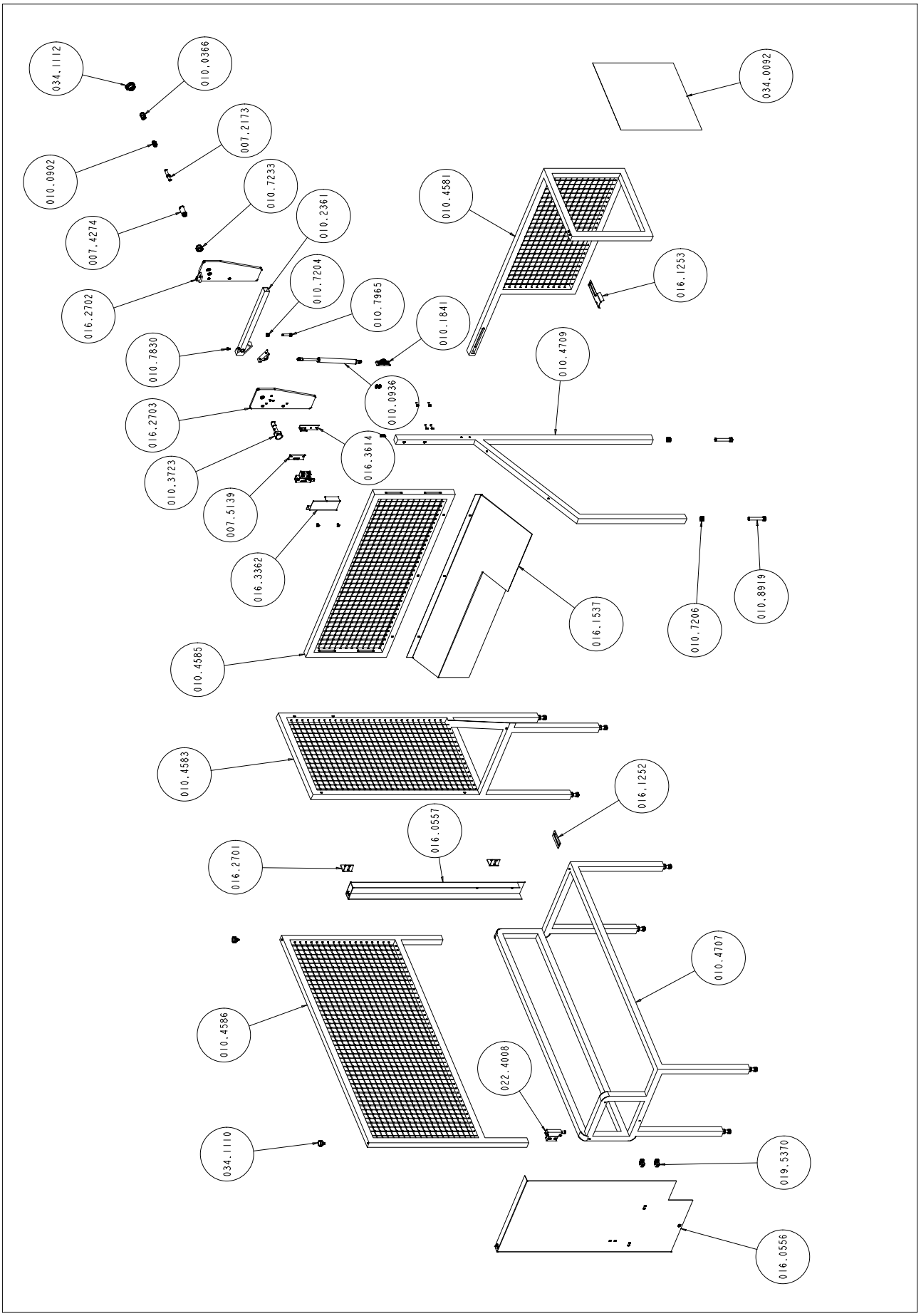
Code	Description	Description	Q.ty
010.1837	SET ATTACCHI 905.010–905.011	ATTACHMENTS SET	2,000
013.0192.1	PIEDISTALLO SH 332 NC 5.0	STEEL BASE SH 332 NC 5.0	1,000
016.0165	RACCOGLITORE ACQUA SH320–332	WATER COLLECTOR	1,000
022.0211	RACCORDO RAPIDO SEM PG 13,5	RAPID JOINT SEM PG 13,5	1,000
022.0237	PRESSACAVO PG 11 BS03	CABLE PRESSER PG 11 BS03	2,000
022.0244	CONTRODADO 3217B GRIGIO PG 13,5	LOCK NUT 3217B GREY PG 13,5	1,000
022.0324	PASSACAVI 24 INC.MM.2.5	FAIRLEADS 24 INC.M M.2.5	2,000
022.0348	ADATTATORE ADM–MP 16–11 M16X1,5PG11	ADAPTER	2,000
028.0099	VALVOLA DI NON RITORNO 3/8’	”NON RETURN VALVE 3/8””””	1,000
028.0121	RACCORDO 3/8–17 CL 2601	JOINT 3/8–17 CL 2601	3,000
028.0260	ELETTROPOMPA V.220–240/380–415.50HZ-SPV33	ELECTROPUMP 230–400.50 HZ SPV33	2,000
028.0391	TUBO LOOC LINE SPD ART.69540 3/4	LOOC LINE HOSE SPD ART.69540 3/4	1,000
028.0396	UGELLO 0 20 SPD FP50.11B50	NOZZLE 0 20 SPD FP50.11B50	1,000
028.0401	RACCORDO 3/4 SPD FP50.17A20	FITTING 3/4 SPD FP50.17A20	1,000
034.0901	TAPPO LIVELLO OLIO 1/2 ’GAS.	1/2” GAS. OIL LEVEL CAP	1,000
034.0905	TAPPO OLIO TAO– 3 1/2 POL. NERO	TAO/3 1/2” BLACK OIL CAP	1,000
034.1451	CATENA PORTACAVI 17.04.63.0 AX–CNC	CABLES CHAIN AX–CNC	1,300
043.0180	RIDUZIONE M 3/4–F 3/8	REDUCTION M 3/4–F 3/8	2,000
043.0182	RACCORDO A GOMITO FF ZINCATO 3/4	3/4 ELBOW ZINKED JOINT	1,000
043.0187	ATTACCO A T FMM 3/8 CL 2050	3/8 T FEMALE JOINT CL 2050	1,000
043.0192	RACCORDO RB 9889 3/4X20	RB 9889 JOINT 3/4X20	2,000
043.0216	RACCORDO A –T– FFF 1/4 CL 2003	FFF 1/4 CL 2003 T JOINT	2,000
043.0223	RACCORDO TE FFF ZINCATO 3/4	TE FFF GALVANISED 3/4 JOINT	1,000
043.0252	GOMITO MF 3/8 CL 2020	MF 3/8 CL 2020 ELBOW	2,000
043.0253	GOMITO M.M.3/8 CL 2010	M. M.3/8 CL 2010 ELBOW	1,000
043.0260	TAPPO TTE4 1/4 – CL 2611	1/4 TAP TTE4	2,000
043.0263	RACCORDO A GOMITO M/F ZINCATO 3/4	3/4 ELBOW JOINT	1,000
043.0277	NIPPLO CONICO ZINCATO 3/4	GALVANISED 3/4 CONICAL NIPPLE	1,000
043.0280	MANICOTTO 1/4 M 4/4 – CL 2543	1/4 M 4/4 – CL 2543 SLEEVE	2,000
043.0282	MANICOTTO 3/8	3/8 SLEEVE	1,000
043.0340	RONDELLA RAME 13X19X1,5–1/4	COPPER WASHER 13X19X1,5–1/4	12,000
043.0351	GUARNIZIONE 3/4	3/4 GASKET	1,000
043.0654	RUBINETTO M/F 3/4 CL 6310	M/F 3/4 CL 6310 TAP	1,000
044.0501	NIPPLO NP 1/4 IDRAULICO	NP 1/4 HYDRAULIC NIPPLE	6,000
010.1893	CERNIERA SPORTELLO PIEDISTALLO N.T.	PROTECTION DOOR HINGE N.T.	1,000
016.2451	SPORTELLO PIEDISTALLO SH 332 NC 5.0	STEEL BASE DOOR SH 332 NC 5.0	1,000
010.1809	CHIUSURA SPORTELLO	DOOR LOCKING WIT KEY	1,000

Side guard rail



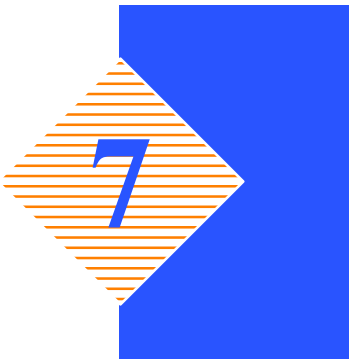
Code	Description	Description	Q.ty
007.4132	SUPPORTO DESTRO BARRA DI PROTEZIONE	RIGHT SUPPORT	1,000
007.4133	SUPPORTO SINISTRO BARRA DI PROTEZIONE	LEFT SUPPORT	1,000
007.4184	PERNO BARRA PROTEZIONE	PROTECTION BAR PIN	2,000
010.1492	STAFFA FIX BARRA PROTEZIONE	BAR PROTECTION FIX BRACKET	2,000
010.1842	SUPPORTO MASCHIO X MOLLA A GAS	SPRING MALE SUPPORT	4,000
010.7088	ANELLO ELASTICO DI ARRESTO AD ESP.	ELASTIC RING STOP ESP.	2,000
010.7229	DADO AUTOBLOCCANTE M8	M8 SELF–LOCKING SCREW NUT	2,000
010.7475	GRANO VCE PUNTA PIANA 8 X 8	8 X 8 FLAT POINT VCE GRUB SCREW	2,000
010.7604	RONDELLA 0 8	0 8 WASHER	8,000
010.7830	VITE BUTON 5 X 10	5 X 10 BUTON SCREW	10,000
010.7852	VITE TCEI 4 X 12	TCEI 4 X 12 SCREW	8,000
010.7868	VITE TCEI 6 X 12	TCEI 6 X 12 SCREW	6,000
010.7893	VITE TCEI 8 X 20	TCEI 8 X 20 SCREW	4,000
010.7967	VITE TE 8 X 40	TE 8 X 40 SCREW	2,000
034.0934	TAPPO DISTANZIALE BARRA PROTEZIONE	SAFETY BAR SPACER TAP	2,000
010.2520	BARRA DI PROTEZIONE ANTERIORE SUPERIORE	UPPER FRONT PROTEC.BAR	2,000
010.2521	BARRA DI PROTEZIONE ANTERIORE INFERIORE	LOWER FRONT PROTEC.BAR	1,000
010.3472	DISTANZIALE MAGNETE X PROTEZ. SH NC–EVO	MAGNETIC FRONT GUARD SUPORT	1,000
010.3482	MAGNETE 20X35 M 6 X PROTEZIONI	MAGNET 20X35 M 6 FOR FENCES	1,000
010.4561	ANGOLARE BATTUTA BARRA DI PROTEZIONEAN-TERIORE	FRONT BAR PROTEC.ANGLE BACK STOP SHNCEVO	2,000
016.0110	CARTER FINECORSA	LIMIT SWITCH COVER	1,000
016.0629	SUPPORTO BARRA DI PROTEZIONE SUPERIORE	TOP PROTEC.BAR SUP.	2,000
016.0630	SUPPORTO BARRA DI PROTEZIONE DX	RIGHT PROTEC.BAR SUP.	1,000
016.0631	SUPPORTO BARRA DI PROTEZIONE SX	LEFT PROTEC.BAR SUP.	1,000
016.1818	PROTEZIONE BARRA ALIMENTAT. DX	FEEDER RIGHT BAR PROTECTION	1,000
016.1244	PIASTRINO CHIUSURA PROTEZIONE DX–SX	PROTECTION CLOSING PLATE L./R.	1,000
007.4837	PERNO DI BATTUTA X PROTEZIONE MOBILEAN-TERIORE	MOVING FRONT PIN STOP	1,000
016.1819	PROTEZIONE BARRA ALIMENTAT.	FEEDER LEFT BAR PROTECTION	1,000
034.0093	PROTEZ.LEXAN GRANDE X PROT.MACCHINE	LEXAN LARGE GUARD MACCHINE PROTE.	1,000
007.5138	DISTANZIALE PROT. FRONTALE SENSORE RFID	DISTANCE FRONT PROTECTION SEN-SOR	1,000
010.4075	MOLLA GAS 150MM.1250N X PROTEZ. SH 332	GASSPRING 150MM.1250N X NC–EVO PROTECT.	1,000
016.1533	PARASCHIZZI ANTERIORE SH 332 NC–EVO	SPLASH SHIELD FRONT SH 332 NC EVO	1,000
016.3363	CARTER CAVO RFID SH NC	CARTER WIRE SHARK	1,000
016.3615	STAFFA FISSAGGIO SENSORE RFID PROTEZ. VERT. ANTERIORE SH NC	BRACKET SENSOR PROTECTION VER-TICAL FRONT	1,000
016.3616	STAFFA FISSAGGIO SENSORE RFID PROTEZ. ANTERIORE SH NC	BRACKET FRONT SENSOR PROTEC-TION	1,000
022.4008	SENSORE DI SICUREZZA RFID ST DD420MK–D1T	SAFETY SENSORS WITH RFID TECH-NOLOGY	1,000

Rear guards group



Code	Description	Description	Q.ty
007.2173	PERNO BLOCCAGGIO CB 349–350 D	LOCKING PIN CB 349/350 D	1,000
007.4274	BUSSOLA PERNO BLOCC.X PROT.	BRUSHING CLAMPING PIN	1,000
007.5139	DISTANZIALE ARCHETTO SENSORE RFID SH 332		1,000
010.0366	GHIERA DI SPALLAMENTO X PROT.	PROTECTION RING NUT	1,000
010.0902	MOLLA PUNTO FISSO TESTA MOD. 95	HEAD FIXED POINT SPRING	1,000
010.0936	MOLLA GAS 125MM.600N	GAS SPRING 125MM.600N	1,000
010.1841	SUPPORTO FEMMINA X MOLLA A GAS	SPRING FEMALE SUPPORT	2,000
010.2361	ASTA SUPPORTO REGOLABILE PROTE-ZIONEMOBILE	ADJUST.MOV.PROTEC.ROD SUP.	1,000
010.3723	PERNO DI SNODO BARRA DI PROT.	PIN FOR ARTICULATED PROTE. BAR	1,000
010.4581	PROTEZIONE LATERALE MOBILE	SIDE MOV.PROTEC.	1,000
010.4585	PROTEZIONE LATERALE SH 332	SIDE PROTEC.	1,000
010.4583	PROTEZIONE POSTERIORE FISSA	REAR FIX PROTEC.	1,000
010.4586	PROTEZIONE POSTERIORE	REAR PROTEC.	1,000
010.4707	SUPPORTO PROTEZIONE POSTERIORE	REAR PROTEC.SUP.	1,000
010.4709	SUPPORTO PROT. LATERALE	SIDE PROTEC.SUP.	1,000
010.7204	DADO M8	M8 SCREW NUT	1,000
010.7206	DADO M12	M12 SCREW NUT	9,000
010.7233	DADO AUTOBLOCCANTE M16	M16 SELF–LOCKING SCREW NUT	1,000
010.7830	VITE BUTON 5 X 10	5 X 10 BUTON SCREW	3,000
010.7965	VITE TE 8 X 35	TE 8 X 35 SCREW	1,000
010.8919	VITE TE 12 X 70	12 X 70 TE SCREW	9,000
016.0556	GUIDA PROT.POSTERIORE SX	REAR LEFT GUIDE PROTEC.	1,000
016.0557	GUIDA PROT.POSTERIORE DX	REAR RIGHT GUIDE PROTEC.	1,000
016.1252	PIASTRINO PROTEZ.POSTERIORE	REAR PROTEC.PLATE	1,000
016.1253	PIASTRINO PROTEZ.ANTERIORE	FRONT PROTEC.PLATE	1,000
016.1537	PARASCHIZZI LATERALE	SIDE SPLASH GUARD	1,000
016.2701	STAFFA PROT. POSTERIORE SH NC–EVO	REAR PROTEC.BRACKET SH NC–EVO	1,000
016.2702	STAFFA SINISTRA	LEFT BRACKET	1,000
016.2703	STAFFA DESTRA	RIGHT BRACKET	1,000
016.3362	CARTER SENSORE RFID PROTEZ. LATERALE		1,000
016.3614	STAFFA FISSAGGIO SENSORE RFID PROTEZ.		1,000
019.5370	FASCETTA LEGRAND ART.31900	LEGRAND CLAMP ART.31900	2,000
022.3941	FINECORSA MODULARE A PISTONCINOCON ROTELLA NB B020BB–SMK	PREWIRED LIMITSWITCH NB B020BB–DMK	2,000
022.4008	SENSORE DI SICUREZZA RFID ST DD420MK–D1T	SAFETY SENSORS WITH RFID TECHNO-LOGY	1,000
034.0092	PROTEZIONE LEXAN PICCOLA X PROT. MAC-CHINA SH NC–EVO	LEXAN SMALL GUARD FOR MACCHINE PROTEC.SH	1,000
034.1110	VOLANTINO O 30 M6 X 10 POS. 105	O 30 M6 X 10 HANDWHEEL	1,000
034.1112	VOLANTINO O 40M8 X PIEDISTALLO SH–CB 330	O 40 M8 HANDWHEEL X STEEL BASE SH	1,000

Adjustments



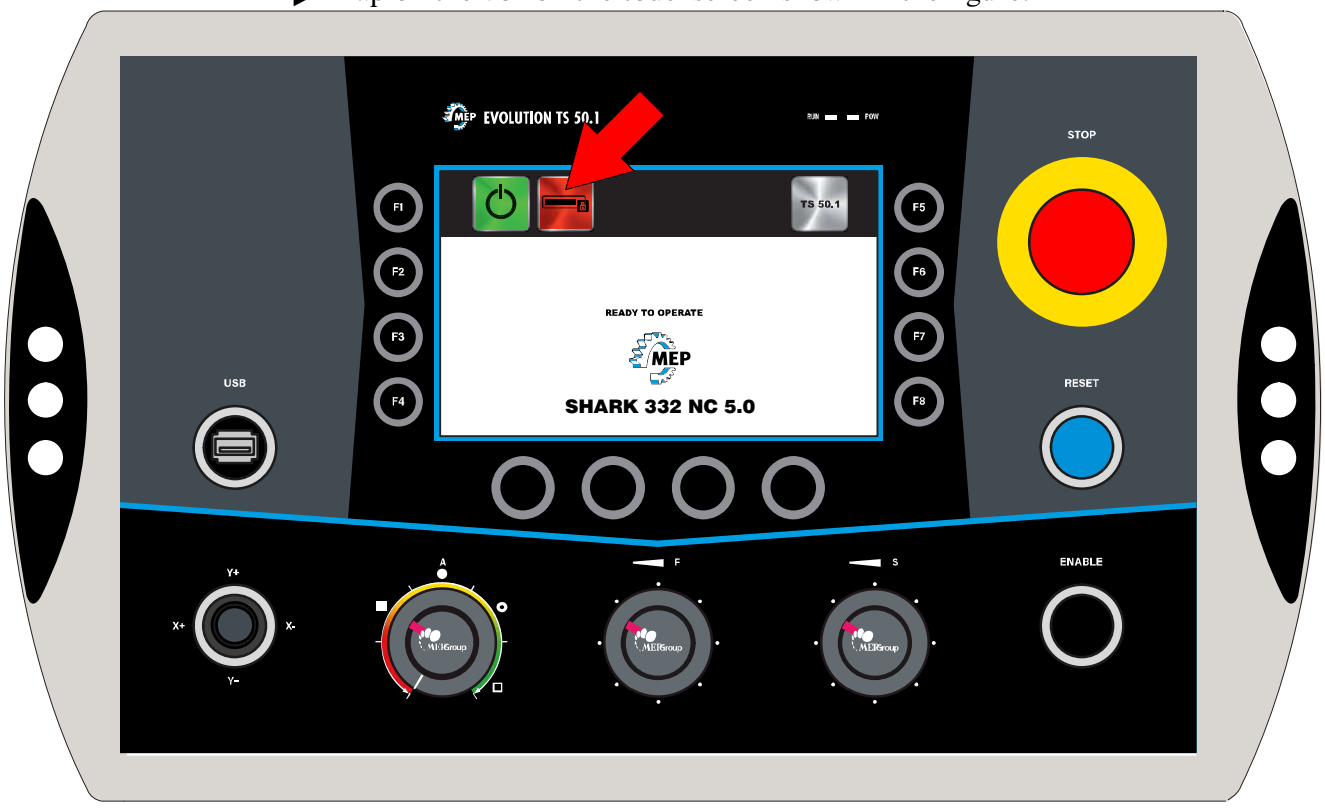
This chapter describes the operations required to adjust the electronic, mechanical and the hydraulic systems. By following these instructions, you can “customise” your machine to suit the type of cut required, thereby optimising cutting times.

Displaying and editing the set–up parameters

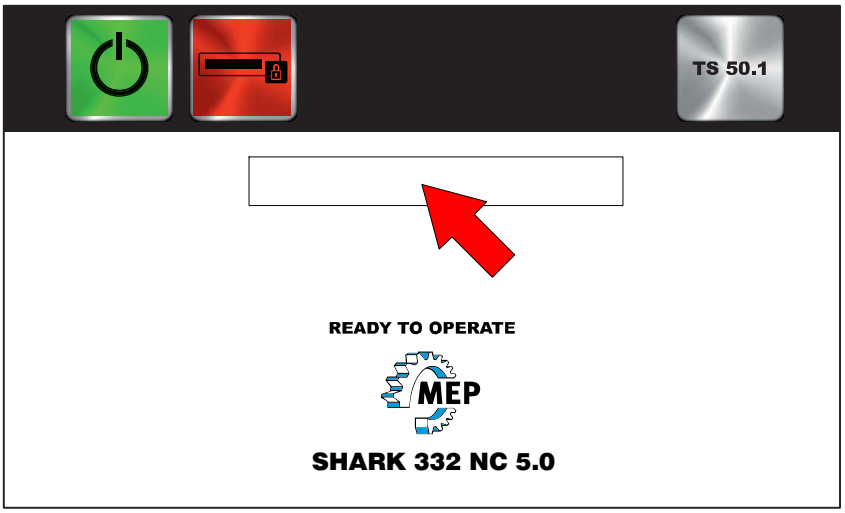
The machine set–up parameters may be programmed directly from the control console.

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

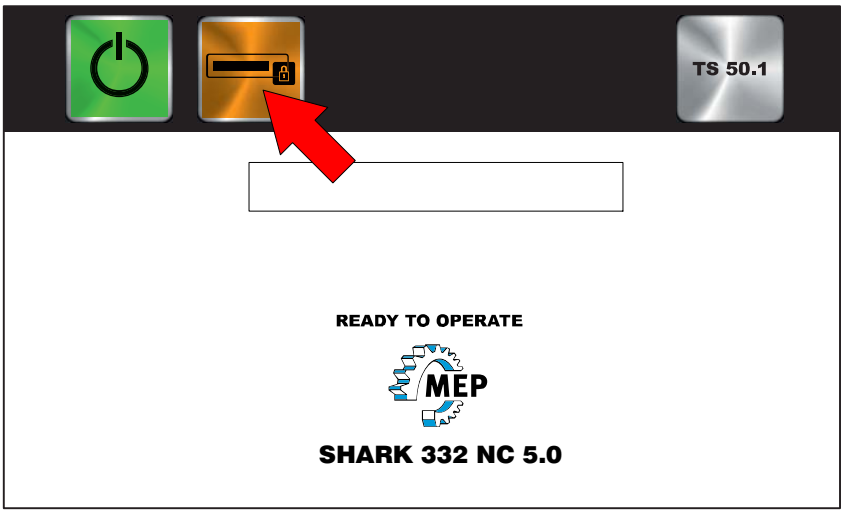
- ▶ Power the machine by turning the main switch on the left of the control board.
- ▶ Tap on the box on the touchscreen shown in the figure.



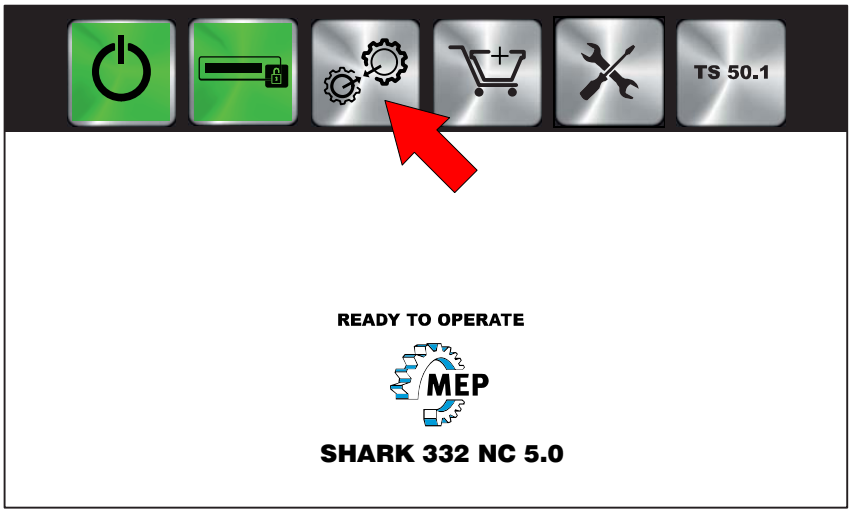
▶ The password entry box will open. Tap the box to open the keypad. Enter 734533.



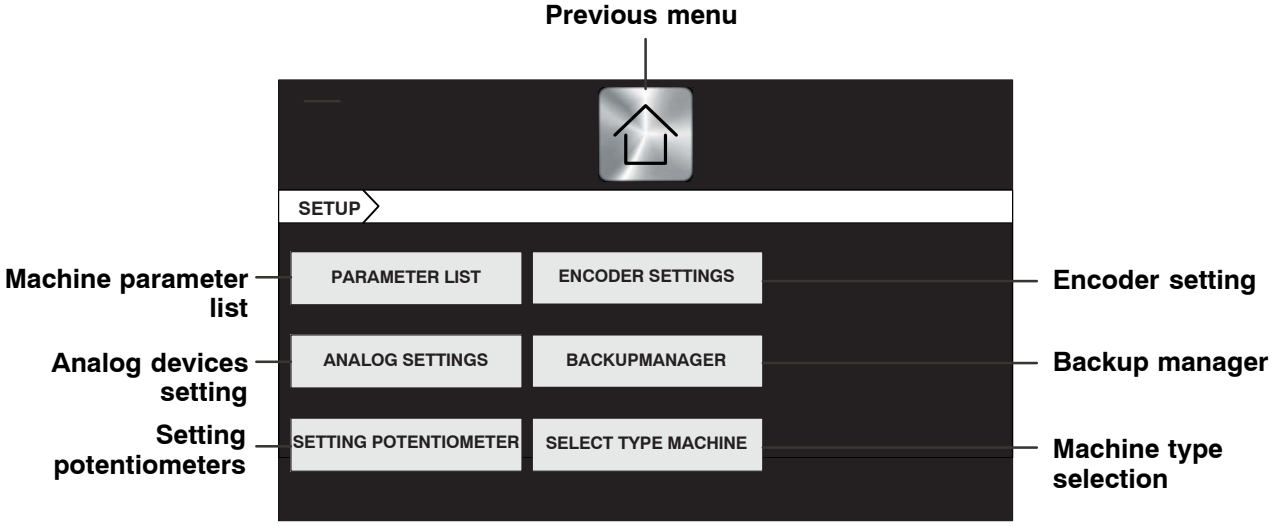
▶ Tap on the box shown in the figure.



▶ Tap on the box shown in the figure.

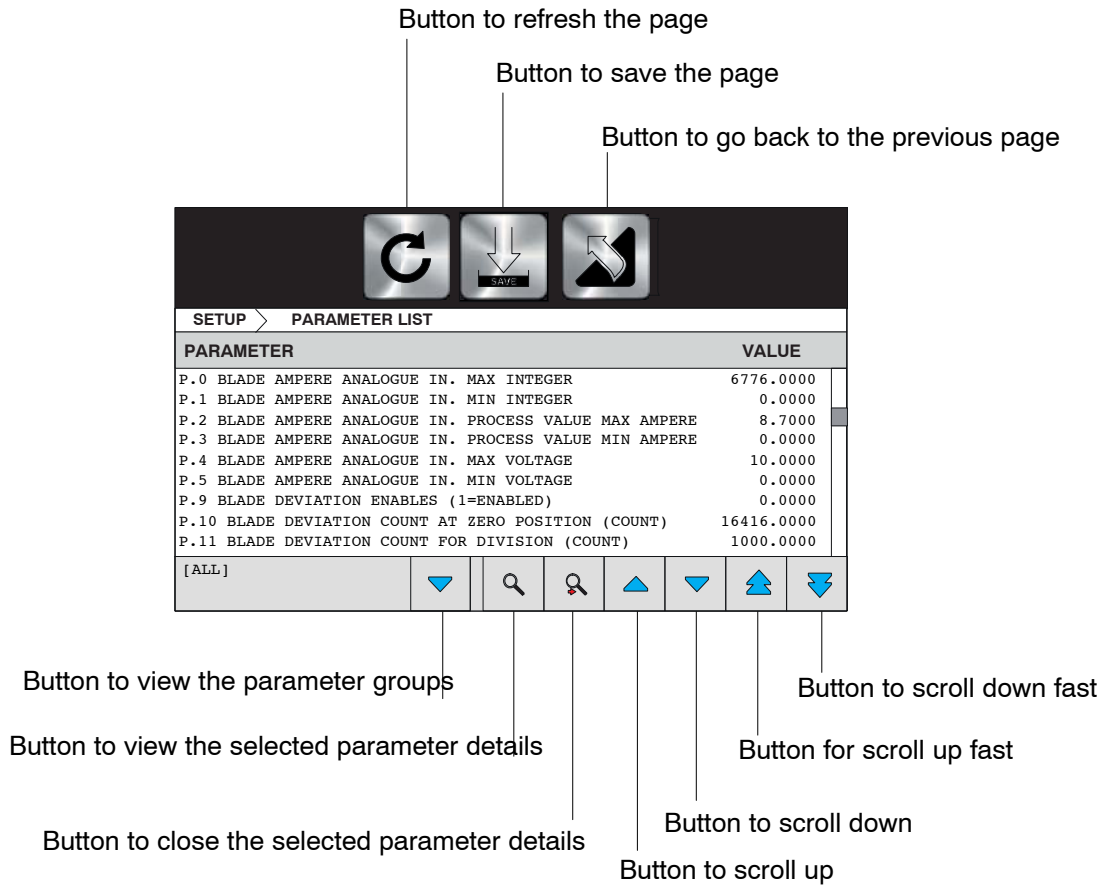


▶ The next video page shows the available functions



Parameter List

▶ Once inside the “Parameter List” menu, use the following three keys to navigate through the different menu screens:



The machine setup parameters divided by topic are shown below.

Blade Motor		
Nr.	**Parameter / Description**	**Value**
P.0	**MAX BLADE MOTOR CONSUMPTION (LEVELS):** Analogue input counter value corresponding to the maximum ampere.	5392.0000

Blade Motor		
P.1	**MIN BLADE MOTOR CONSUMPTION (LEVELS)** Analogue input counter value corresponding to the minimum ampere.	16.0000
P.2	**MAX BLADE MOTOR CONSUMPTION (AMPERE)** Ampere corresponding to maximum analogue input value.	2.7000
P.3	**MIN BLADE MOTOR CONSUMPTION (AMPERE)** Ampere corresponding to minimum analogue input value.	0.0000
P.4	**MAX BLADE MOTOR CONSUMPTION VOLTAGE (V)** Voltage corresponding to maximum analogue input value.	10.0000
P.5	**MIN BLADE MOTOR CONSUMPTION VOLTAGE (V)** Voltage corresponding to minimum analogue input value.	0.0000
P.23	**BLADE MOTOR CONSUMPTION SCAN (SEC)** Control execution time (sec).	0.1500
P.24	**BLADE MOTOR SWITCHING−ON DELAY (SEC) (IF 0 OFF)** Activation delay in seconds (if 0 is off).	0.0000
P.25	**HEAD LOWERING REDUCTION ST. M. ON CONSUMPTION CONTROL (M/MIN OR INCH/MIN)** Correction step.	25.0000
P.27	**TIME FOR BLADE MOTOR MAX I ALARM (SEC)** Alarm time for reaching the motor max. current (sec).	1.0000
P.29	**ENCODER S MAX VALUE (M/MIN OR FT/MIN)** Speed set point maximum value S.	100.0000
P.30	**ENCODER S MIN VALUE (M/MIN OR FT/MIN)** Speed set point minimum value S.	15.0000
P.31	**MAXIMUM AI SPEED VALUE (COUNTERS)** Speed reference maximum value (analogue input maximum value).	32767.0000
P.32	**MINIMUM AI SPEED VALUE (COUNTERS)** Speed reference minimum value (analogue input minimum value).	0.0000
P.33	**BLADE MOTOR STOP DELAY (SEC)** Stop delay for cleaning cut (sec).	0.5000
P.34	**ENCODER S READING REVERSAL (1=REVERSED)** Blade speed encoder counter inversion.	1.0000
P.35	**MAX ENCODER S (M/MIN OR FT/MIN)** Blade speed maximum value.	100.0000
P.36	**MIN ENCODER S (M/MIN OR FT/MIN)** Blade speed minimum value.	15.0000
P.37	**ENCODER S PULSE (MM/PULSE OR INCH/PULSE)** Relationship between impulses and rotation measure.	1.0000
P.43	**BLADE SPEED MONITORING BEFORE ENABLING ON DELAY SEC** Delay in controlling the min. Speed.	8.0000
P.45	**BLADE SPEED MONITORING NUMBER OF PICK−UP PULSES PERIOD** Number of spokes/pulley.	13.0000

Blade Motor		
P.47	**BLADE SPEED MONITORING MIN SPEED WATCH DOG VALUE M/MIN OR FT/MIN** Min. speed in m/min or ft/min.	10.0000
P.114	**CURRENT THRESHOLD FOR MAXIMUM FEED CORRECTION (A)** Motor max. absorption value.	3.0000
P.140	**SPEED ENCODER TYPE (0=LINEAR 1=LOGARITHMIC)** Encoder type.	0.0000
P.141	**LOGARITHMIC SPEED ENCODER X1 THRESHOLD (COUNTERS):** X1 correction factor for managing the head lowering speed encoder in logarithmic mode.	4.0000
P.142	**LOGARITHMIC SPEED ENCODER X2 THRESHOLD (COUNTERS):** X2 correction factor for managing the head lowering speed encoder in logarithmic mode.	8.0000
P.143	**LOGARITHMIC SPEED ENCODER X1 MULTIPLIER:** X1 correction multiplier for managing the head lowering speed encoder in logarithmic mode.	10.0000
P.144	**LOGARITHMIC SPEED ENCODER X2 MULTIPLIER:** X2 correction multiplier for managing the head lowering speed encoder in logarithmic mode.	1000.0000

Head Transducer		
Quantity	**Parameter / Description**	**Value**
P.13	**MAX HEAD POSITION (LEVELS):** Maximum counter value.	17716.0000
P.14	**MIN HEAD POSITION (LEVELS):** Minimum counter value.	6515.0000
P.15	**REAR HEAD LIMIT POSITION (MM or INCH):** Max. value in mm or inches of the totally up position of the head.	263.0000
P.16	**FORWARD HEAD LIMIT POSITION (MM or INCH):** Min. value in mm or inches of the totally down position of the head.	0.0000
P.17	**MAX HEAD POSITION VOLTAGE (V):** Voltage value corresponding to the totally up position of the head.	10.0000
P.18	**MIN HEAD POSITION VOLTAGE (V):** Voltage value corresponding to the totally down position of the head.	0.0000

LEVEL_1		
Quantity	**Parameter / Description**	**Value**
P.26*	**BLADE MOTOR MAX I (A)** Maximum allowed current.	8.5000
P.44	**PULLEY DIAMETER (MM OR INCH):** Pulley diameter.	347.0000
P.46	**MINIMUM BLADE SPEED CONTROL TIME (SEC)(0=DISABLED)** Delay in controlling single impulses.	0.5000
P.51*	**MAX BLADE TENSIONING ALARM (KG OR LB):** Maximum voltage allowed to apply adjustment.	1100.0000

LEVEL_1		
P.52*	**MIN BLADE TENSIONING ALARM (KG OR LB):** Minimum voltage allowed to apply adjustment.	600.0000
P.80	**CALIBRATION PARAMETER MEASUREMENT SYSTEM (MKS=1,IMPERIAL=0):** Imperial = 0.0: sets measuring system MKS (0) or IMPERIAL (1).	1.0000
P.86*	**MAXIMUM Y END OF TRAVEL (MM OR INCH):** Y axis maximum limit switch (mm or inch).	261.0000
P.87*	**MINIMUM Y END OF TRAVEL (MM OR INCH):** Y axis minimum limit switch (mm or inch).	0.5000
P.89*	**Y DECELERATION SPACE (MM or INCH):** Deceleration space (mm or inch): distance from target position at which slow descent is set.	12.0000
P.93*	**RHLS CPT SPEED (MM OR IN/MIN):** Slow Y position speed (mm/min or inch/min).	90.0000
P.94*	**CPT ABATING SPEED (MM/MIN OR INCH/MIN):** Y upward speed (mm/min or inch/min).	3100.0000
P.117*	**MAX REAR X AXIS VALUE (MM / INCH):** Feeder max. Stroke.	605.0000
P.119	**SLOW X AXIS MANUAL SPEED (MM/MIN OR INCH/MIN):** Slow feeding.	500.0000
P.120*	**FAST X AXIS MANUAL SPEED (MM/MIN OR INCH/MIN):** Fast feeding.	1500.0000
P.121*	**X AXIS BEYOND ZERO (MM or INCH):** X axis beyond zero mm or inch.	7.0000
P.122*	**X AXIS ZEROING SPEED (MM/MIN OR INCH/MIN):** Speed of search for microswitch while the trolley is zeroed.	2000.0000
P.123	**X AXIS MICRO RELEASE SPEED (MM/MIN OR INCH/MIN):** Speed of release from the search while the trolley is zeroed.	300.0000
P.131*	**SLOW Y AXIS MANUAL SPEED (MM/MIN OR INCH/MIN):** Slow manual head lowering.	850.0000
P.132*	**FAST Y AXIS MANUAL SPEED (MM/MIN OR INCH/MIN):** Fast manual head lowering.	2032.0000
P.133	**RHLS OFFSET MM OR INCH:** Offset for rear head limit switch.	0.5000
P.134*	**X AXIS FWD/BCKW SPEED (MM/MIN OR INCH/MIN):** Feeder speed in cutting cycle.	4000.0000
P.186	**OUT 3 (0=BLADE TENS.+;1=MOT.BRUSH;2=FCTI)**	1.0000
P.192*	**X AXIS POSITIONING SPEED (MM/MIN OR INCH/MIN)**	4000.0000
Blade Tension		
Quantity	**Parameter / Description**	**Value**
P.57	**MAX BLADE TENSIONING VALUE(LEVELS):** Maximum counter value from load cell analogue input.	4960.0000

Blade Tension		
P.58	**MIN BLADE TENSIONING VALUE(LEVELS):** Minimum counter value from load cell analogue input.	16.0000
P.59	**MAX BLADE TENSIONING (KG or LB):** Load cell analogue input maximum value allowed for acquisition.	900.0000
P.60	**MIN BLADE TENSIONING (KG or LB):** Load cell analogue input minimum value allowed for acquisition.	0.0000
P.62	**MAX BLADE TENSIONING VOLTAGE (V):** Load cell analogue input voltage maximum value.	10.0000
P.63	**MIN BLADE TENSIONING VOLTAGE (V):** Load cell analogue input voltage minimum value.	0.0000

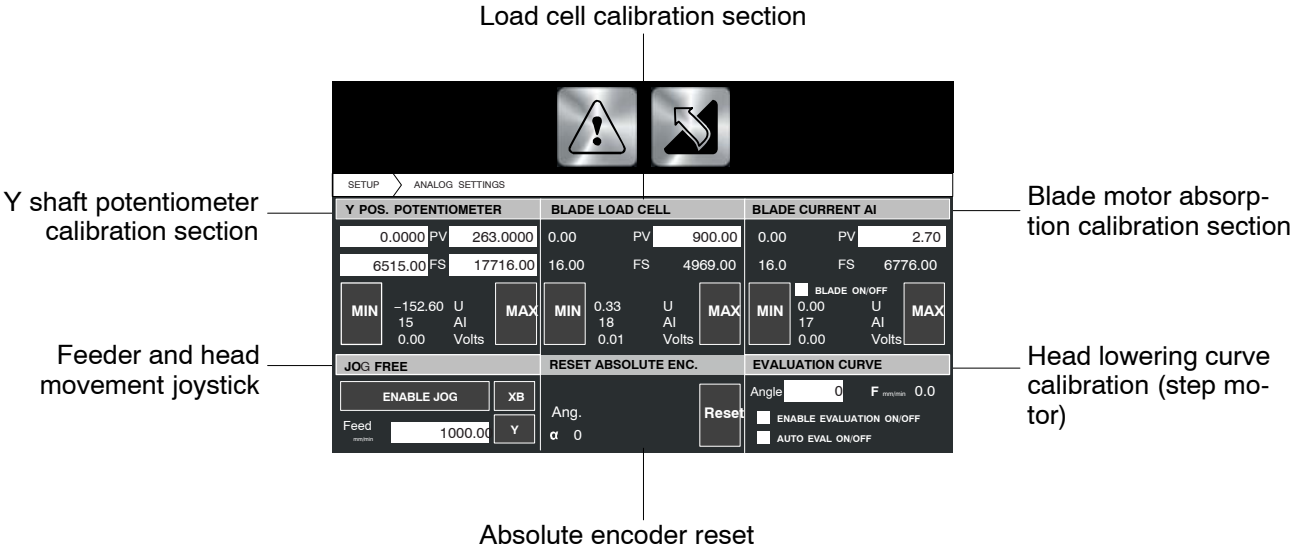
Cutting Head		
Quantity	**Parameter / Description**	**Value**
P.67	**ENCODER F READING REVERSAL (1=REVERSED):** Enables the reversal of the reading for the F value scale.	1.0000
P.68	**MAX ENCODER F (MM/MIN or INCH/MIN):** Max. speed that can be set by encoder F.	1000.0000
P.69	**MAX ENCODER F (MM/MIN or INCH/MIN):** Min. speed that can be set by encoder F.	0.0000
P.70	**ENCODER F PULSE (MM/PULSE OR INCH/PULSE):** Relationship between impulse and supply measure.	1.0000
P.75	**ENCODER F RETENTION ENABLEMENT (1=ENABLED):** Enables the retentive memory of the encoder F.	1.0000
P.82	**Y AXIS ST. MOTOR OPENING (DEGREES):** U axis maximum stroke (mm or inch).	300.0000
P.90	**TOLERANCE FOR HEAD FEEDING CONTROL (MM OR INCH):** Check of the head advancing tolerance.	5.0000
P.113	**Y HEAD LOWERING PID CORRECTION INCREMENT (DEGREES):** F correction factor.	1.5000
P.115	**SCAN ON HEAD LOWERING SPEED CONTROL (SEC):** Time between one correction and the next.	0.1000
P.124	**MAX H POTENTIOMETER VALUE (% OR A):** Max. displayed value of H.	8.5000
P.125	**MIN H POTENTIOMETER VALUE (% OR A):** Min. displayed value of H.	3.0000
P.126	**MAX H POTENTIOMETER VALUE (LEVELS):** Max. levels of the H potentiometer.	32736.0000
P.127	**MIN H POTENTIOMETER VALUE (LEVELS):** Min. levels of the H potentiometer.	16.0000
P.128	**MAX CUTTING FORCE CURRENT CONTROL (AMPERE):** Max. set current of blade motor.	8.5000
P.129	**MIN CUTTING FORCE CURRENT CONTROL (AMPERE):** Max. set current of blade motor.	3.0000

Cutting Head		
P.135	**F ENCODER TYPE (0=LINEAR 1=LOGARITHMIC):** Setting the encoder feeding as linear or logarithmic (0 = linear; 1 = logarithmic).	1.0000
P.136	**LOGARITHMIC FEED ENCODER X1 THRESHOLD (COUNTERS):** X1 correction factor for managing the head lowering speed encoder in logarithmic mode.	4.0000
P.137	**LOGARITHMIC FEED ENCODER X2 THRESHOLD (COUNTERS):** X2 correction factor for managing the head lowering speed encoder in logarithmic mode.	8.0000
P.138	**LOGARITHMIC FEED ENCODER X1 MULTIPLIER:** X1 correction multiplier for managing the head lowering speed encoder in logarithmic mode.	10.0000
P.139	**LOGARITHMIC FEED ENCODER X2 MULTIPLIER:** X2 correction multiplier for managing the head lowering speed encoder in logarithmic mode.	500.0000
P.151	**FEED DISPLAY IN FILTERED CYCLE (1=ENABLED):** Displaying of the filtered F value in machining cycle.	1.0000
P.174	**PERIOD OF ALARM FOR HEAD BLOCKED (SEC):** Set time for alarm publishing.	30.0000
P.185	**BLADE SAFETY POSITION (MM OR INCH):**	−50.0000
Timings		
Quantity	**Parameter / Description**	**Value**
P.96	**HYDRAULIC PUMP OFF DELAY (SEC):** Hydraulic pump off delay before stopping (seconds).	50.0000
P.150	**SIREN DEACTIVATION TIME (MIN):** Siren off time.	2.0000
P.152	**TIME FOR LOCKED EJECTOR ALARM (SEC) (PROXIMITY):** Time for chip ejector jammed alarm.	20.0000
PASSWORD		
Quantity	**Parameter / Description**	**Value**
P.99	**USER PASSWORD VALUE:** Password value setting.	7210721.0000
Misc		
Quantity	**Parameter / Description**	**Value**
P.101	**MACHINE TYPE (0=SHARK230 1=SHARK331 2=SHARK332 3=SHARK281 4=SHARK282 5=SHARK330 6=TIGER352 7=COBRA352 8=C350−2NC 9=PNF350−2NC 10=TIGER352V 11=SHARK350):** Defines the machine type (set automatically by loading the machine .cns file).	2.0000
P.102	**ABSOLUTE ENCODER ZEROING (DEGREES):** Offset value for absolute encoder.	90.7471
P.153	**TYPE LOGO (0=MEP; 1=ZEPH; 2=S&F; 3=TAKEKO; 4=SCOTT; 5=PM; 6=HYDMECH).**	0.0000

P.153	**TYPE LOGO (0=MEP; 1=ZEPH; 2=S&F; 3=TAKEKO; 4=SCOTT; 5=PM; 6=HYDMECH).**	0.0000
AXIS CART		
Quantity	**Parameter / Description**	**Value**
P.118	**MIN FORWARD X AXIS VALUE (MM / INCH):** Feeder min. Stroke.	0.0000
P.189	**MAX. LENGTH FOR MICRO SEARCH (MM OR INCH)**	745.0000
OPTIONAL:		
Quantity	**Parameter / Description**	**Value**
P.163	**CLEAN CUT OFFSET (MM or INCH):** feeder movement measurement for the passage of the blade during the rising of the head.	4.0000
P.164	**FEED FORCE MANAGEMENT TYPE (0=%\; 1=A):** Feed Force regulator value scale management mode.	1.0000
P.175	**DISPLAYING AN ALARM FOR ONCE (1 = ENABLE 0 = DISABLE):** Enables the possibility of displaying one alarm at a time.	0.0000
P.176	**ENABLE POP–UP ALARM (1 = ENABLE 0 = DISABLE):** Enables the possibility of displaying alarm messages in pop−up windows.	1.0000
P.187	**ENABLE CHECK SHUTTLE POS WHIT OVER STROKE (1=ENABLED)**	1.0000
P.188	**QUEUE FILE BACKUP ENABLEMENT (1=ENABLED)**	0.0000
P.190	**BITS PRESENT (1=YES; 0=NO)**	0.0000
P.191	**MATERIAL HANDLING ENABLING (1=YES; 0=NO)**	0.0000
P.END	**DEBUG DISPLAY ENABLEMENT:** debug procedure enablement.	0.0000

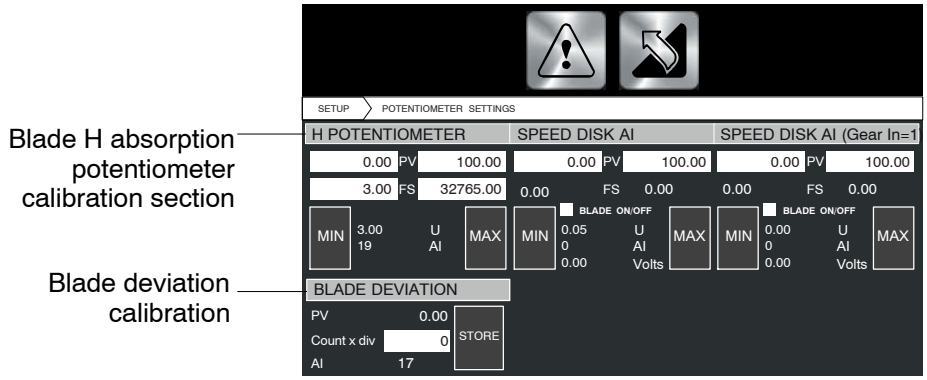
Analog device setting

In this page you can calibrate the machine analog devices



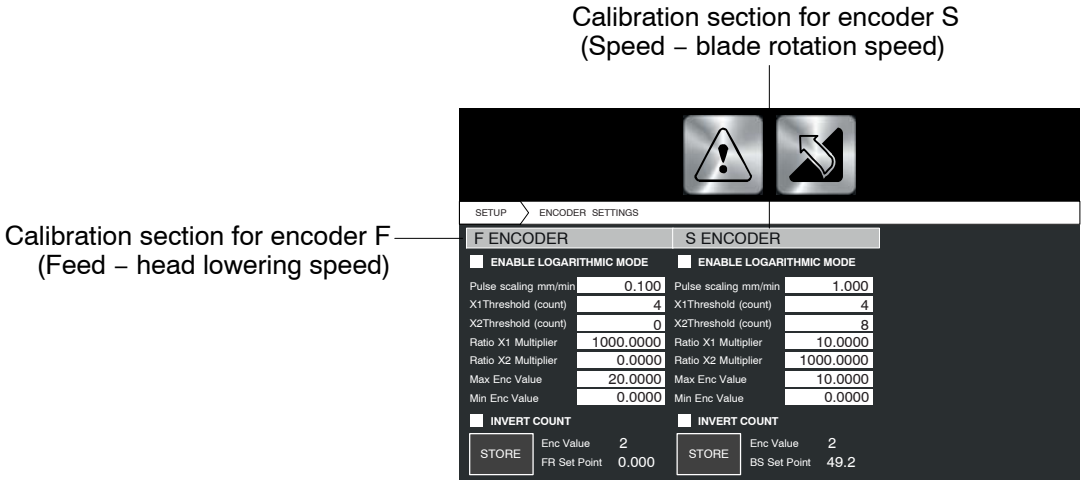
Potentiometer setting

In this page you can calibrate the H blade motor absorption potentiometer, the encoders: F (feed) for adjusting the head lowering; S (speed) for adjusting the speed of the blade rotation (Speed 1−2 for disc machines only) and of the blade deviation device.



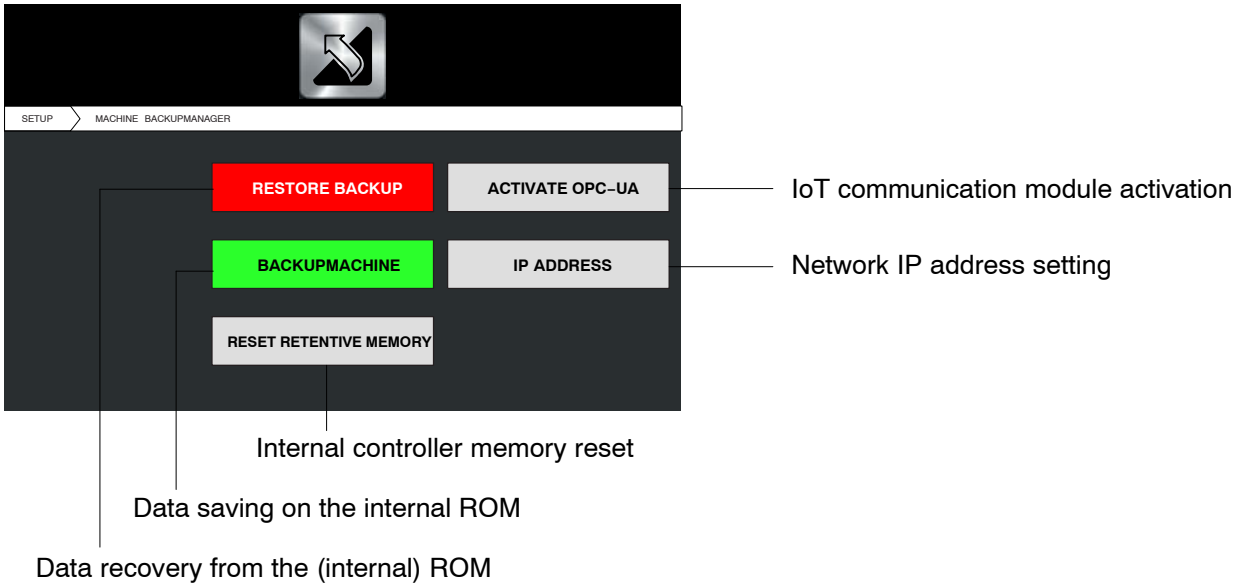
Encoder setting

In this page your can calibrate the encoders: F (feed) for adjusting the head lowering; S (speed) for adjusting the blade rotation speed.



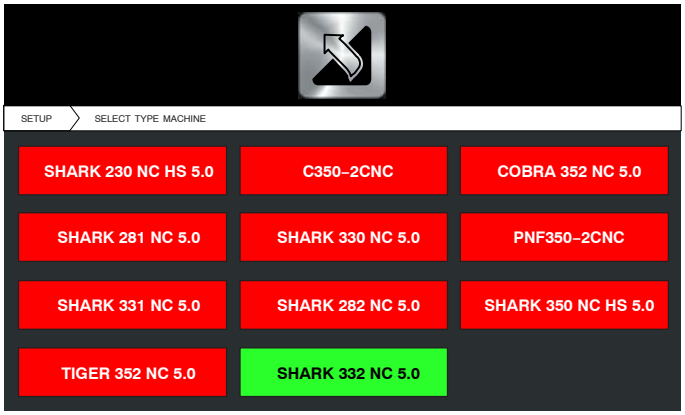
Control memory management

In this page you can manage the control memory data by saving it (backup) or resetting it (restore) on a USB storage device. You can also configure the network for the data transmission, if the machine is equipped with IoT device.



Machine type selection

In this page you can select the model of the sawing machine, each one customised with its own parameters.



Machine working pressures

This section describes the procedures to change the vice and head operating pressures. Both adjustments strongly depend on the material type being processed.
The vice locking pressure can be set if the material could be strained or could be quite unstable while cutting.
The head lowering speed can be set by a flow adjuster on the control console.



Hydraulic pressure

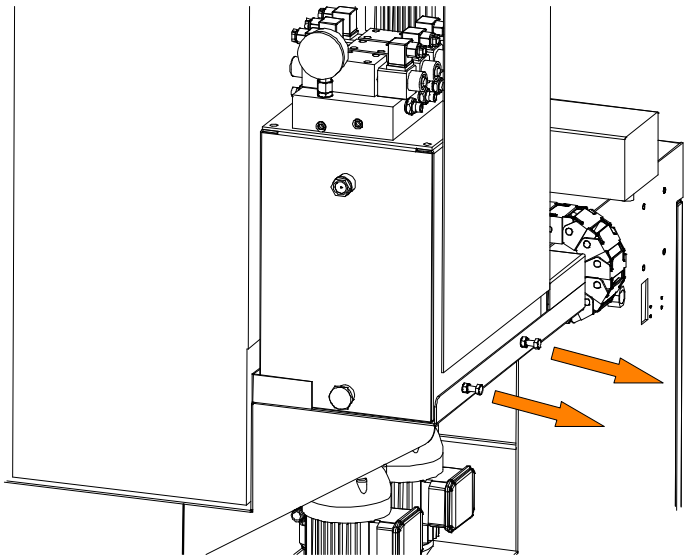
Both vice and head pressures can be adjusted by the power packs.

Warning

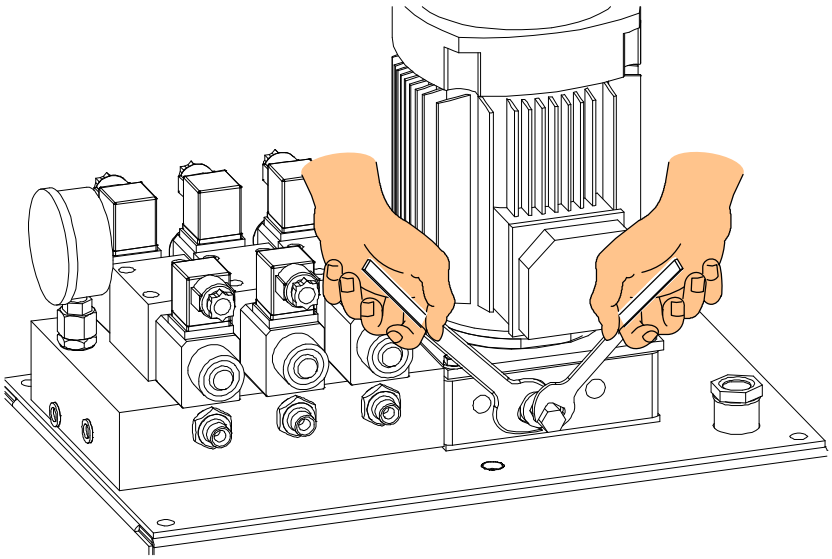
Please note that the hydraulic vice has a 8–mm stroke, thus after having positioned the material on the cutting table and before starting the cycle the mobile jaw must be approached to the material being processed at the ideal distance of 2÷3 mm, as indicated in chapt. 5.

The operating pressures (shearing vice and cutting head) can be adjusted by the max. pressure adjusting valve.

▶ Remove the fastening screws and pull out the power pack from inside the base.



▶ Slacken the hex nut on the relief valve, and using an Allen key, increase (clockwise) or reduce (counter−clockwise) the pressure reading on the pressure gauge.



▶ This done, tighten the lock nut and return the hydraulic power pack back inside the base.

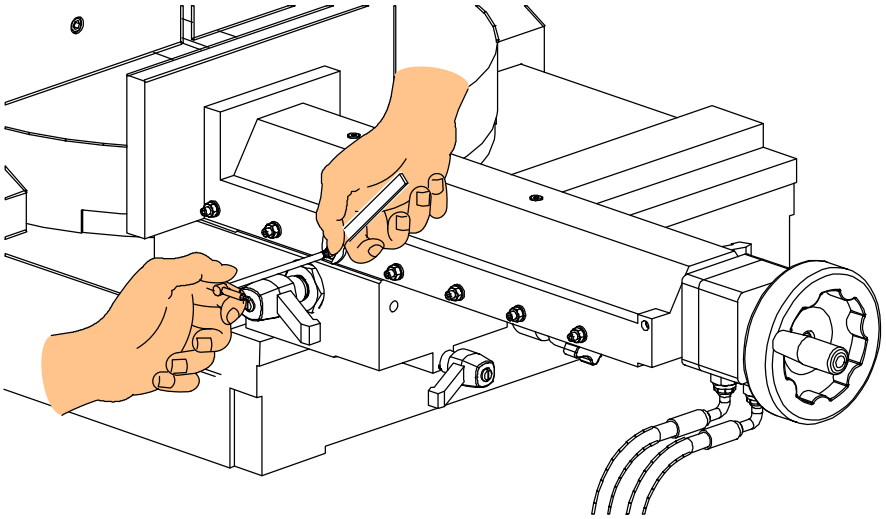
Vice

Vice play adjustment

Any play that develops between the slideway and the slide gib on the vice must be compensated by adjusting the grub screws regulating the distance between the gib and the lead screw, proceeding as follows:

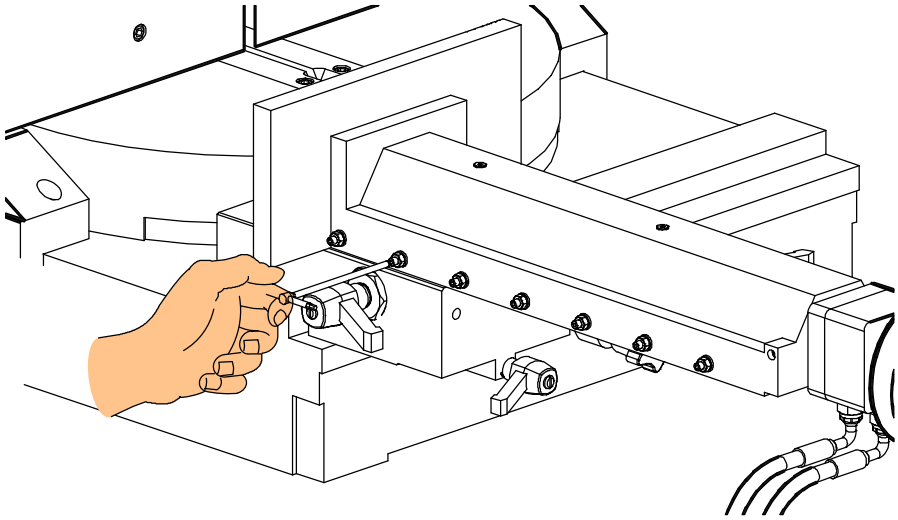
▶ slacken all the locknuts on the grub screws, using a hexagonal key to hold the screws still;

▶ open the vice to its full extension;

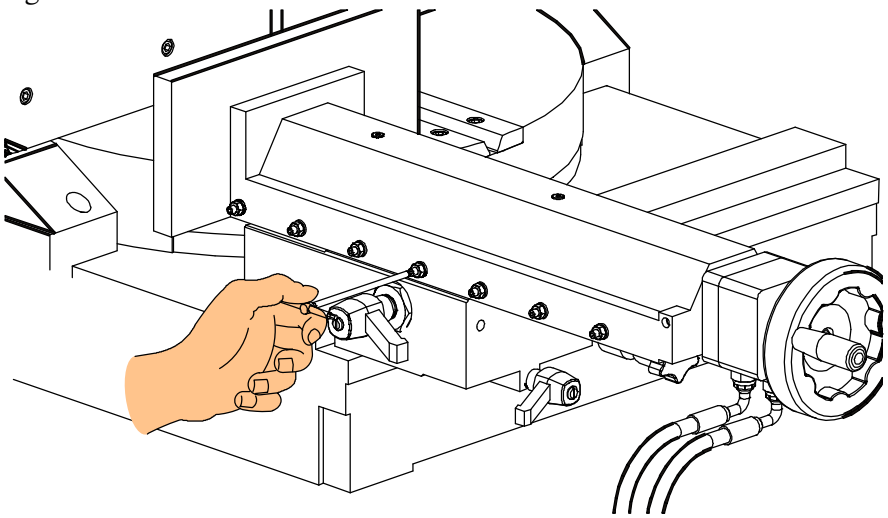


▶ adjust the slight pressure exerted by the grub screws on the gib, starting with the first two in contact with the lead screw;

- after adjusting the two grub screws, tighten the locknut, holding the grub screws with the hexagonal key;



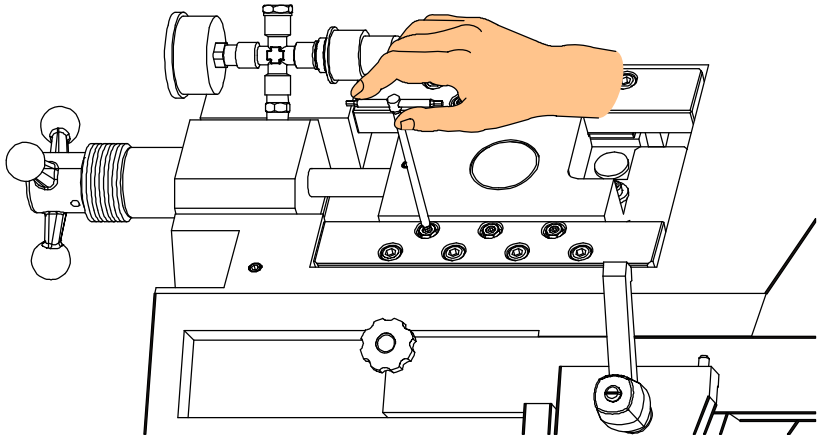
- close the vice until two more grub screws are in the same position as the first two previously;
- repeat the operation on the gib grub screws on all the slideway grub screws;
- at the end of the operation, use the handwheel to move the slideway back and forth, identifying the zones where the grub screws exert greater pressure on the gib.



Cutting head

Blade tensioner slide play adjustment

To reduce the play which develops over a period of time between the blade tensioner slide and the slide gibs, the grub screws separating the gibs from the slide must be adjusted as follows:

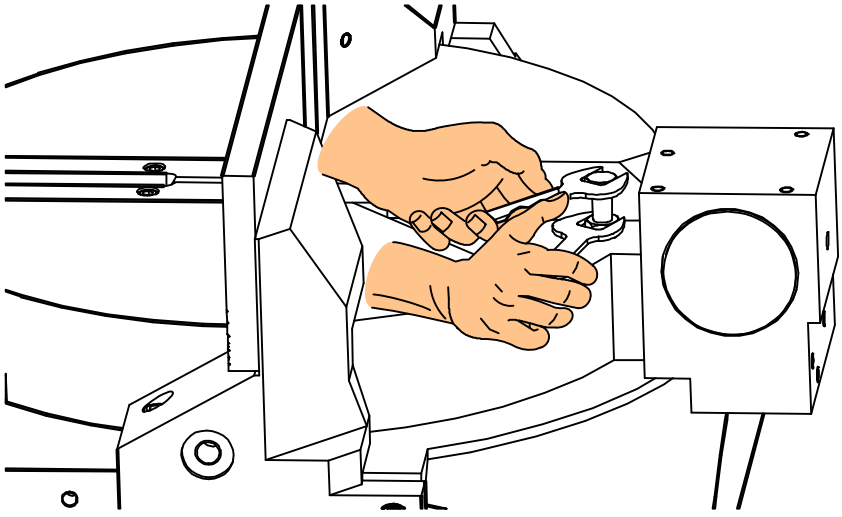


- remove the blade from the flywheels;
- move the slide backwards and forwards to locate any friction or play;
- slacken the nuts, holding the grub screws with a hexagonal pipe wrench;
- if there is play, tighten the grub screws; if there is friction rubbing, loosen the grub screws.

Adjusting operating head travel

During the cutting cycle the cutting head stroke is limited by the FCTI (Head Upstroke Limit) and FCTA (Head Downstroke Limit), set electronically on the control panel, as described on Page 5. The cutting head has a mechanical limiting switch that determines its downstroke:

- to change this setting, two hexagonal spanners must be used, one to keep the nut in position, and the other to tighten and loosen the stop screw.



Blade guide parts

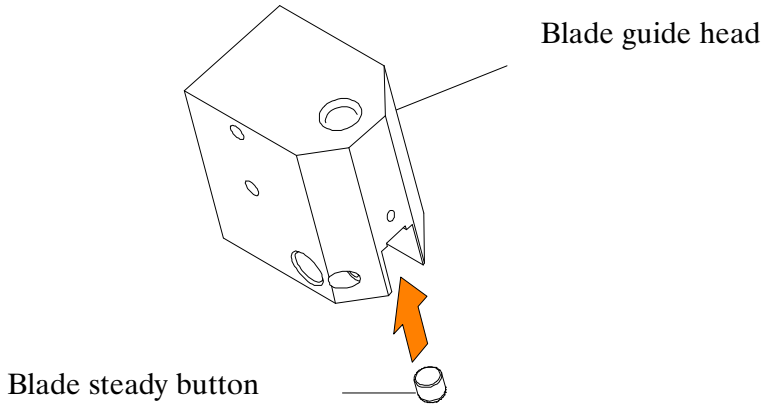
Band saw blades offer enormous advantages to cutting applications, without requiring any special skills by the operator. A description follows of the blade guide adjustments required to ensure correct operation of the saw.

Blade guide heads

The first blade adjustment involves adjustment of the heads. The blade guide heads comprise the blade guide plates which ensure correct longitudinal alignment, the blade steady buttons which control vertical blade flexure, and the coolant supply cocks.

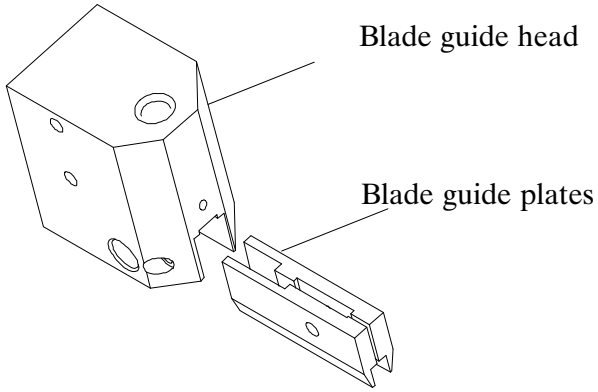
Blade steady buttons

The blade steady buttons prevent upward blade flexure caused by the vertical action of the cutting force. These buttons are fitted on both the front and rear heads, and need no adjustment.



Blade guide plates

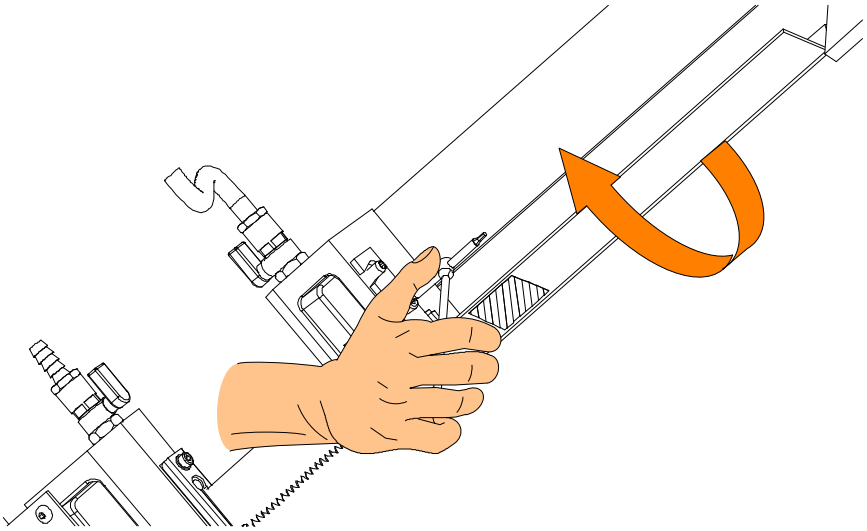
The plate contact points feature widia inserts which guide the blade longitudinally. A small amount of play must exist between the plates and blade to ensure that the blade runs smoothly and perpendicular to the work table.



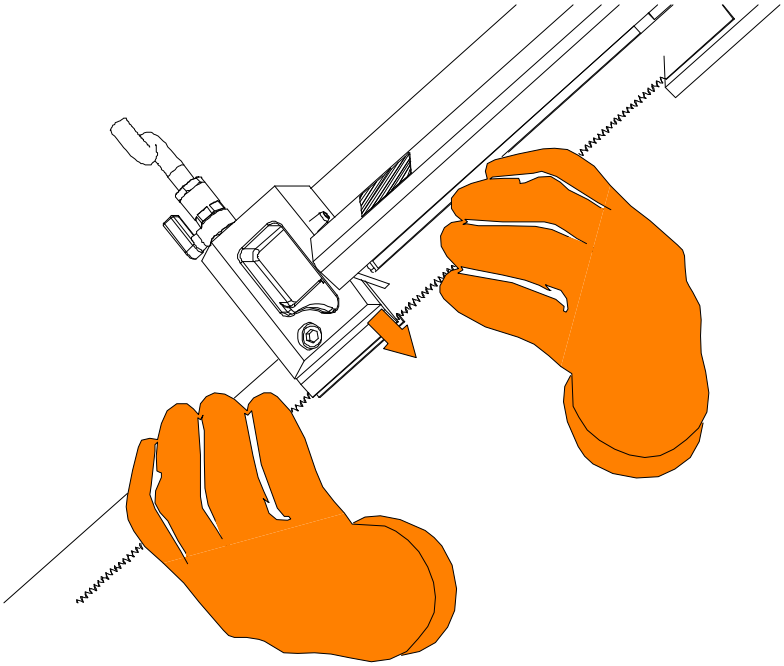
Thanks to the widia inserts, the working life of the guide plates is practically the same as that of the machine itself. However, if due to wear or the assembly of a new blade with a different thickness, the amount of play between the plates and blade changes, the plates must be adjusted as follows:

▶ disconnect the machine from the power supply;

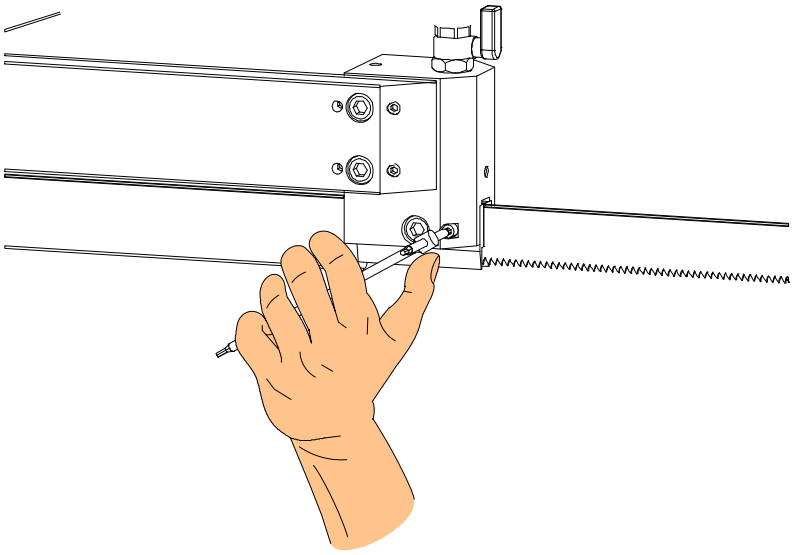
- slacken the blade tension using the handwheel;
- open the front blade guard by undoing the fixing screw and rotating it as illustrated in the figure below;



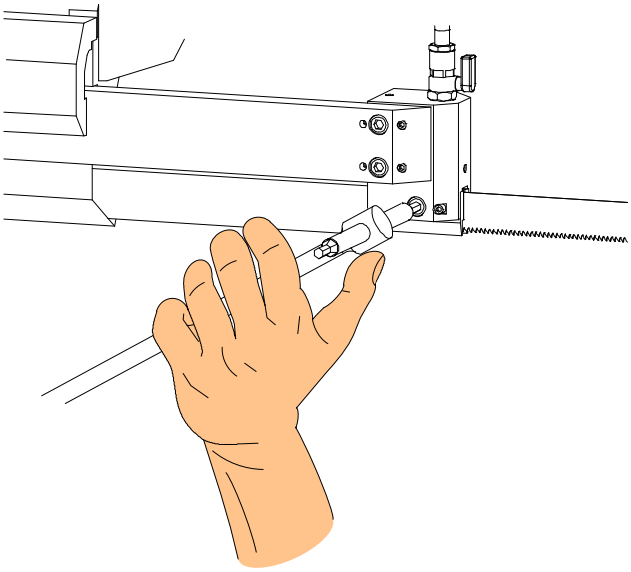
- wear protective gloves when making this adjustment;
- make sure there is a small amount of play between the blade and guide plate inserts;



- if the amount of play is not sufficient for the blade to run smoothly, adjust the locking torque of the two grub screws with an Allen key;



- replace any worn plates by removing the plate fixing screw;



- repeat the above sequence of steps on the rear blade guide head;
- refit the front blade guard;
- tension the blade and power up the machine again.

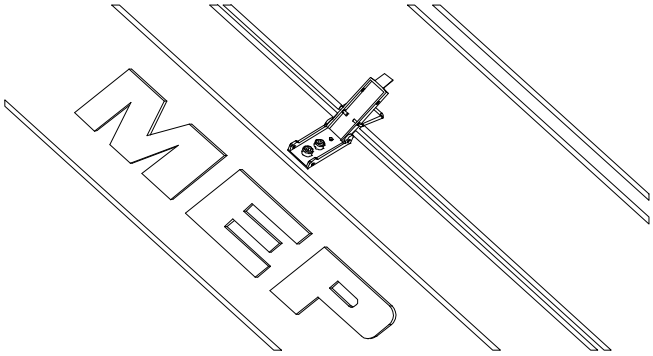
Blade

The adjustments required to ensure correct operation of the blade are described below. For further information about band saw blades, refer to Chapter 9 which provides a more detailed description of the different types of blade.

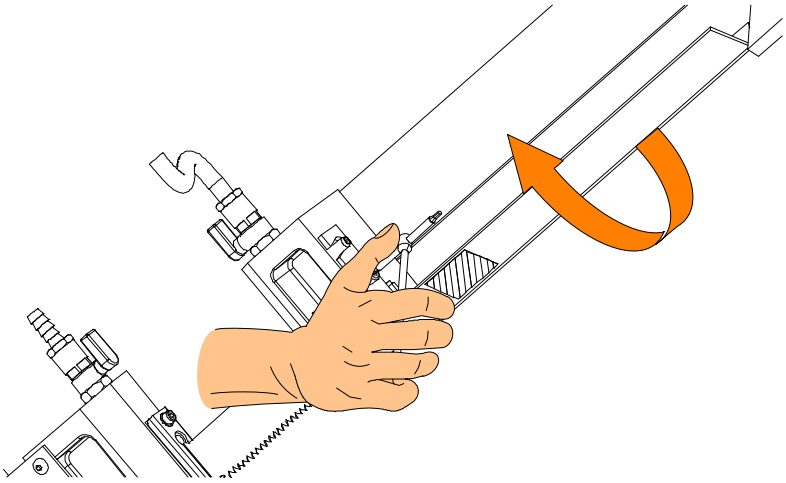
Tool change

Optimum working conditions both enhance operator safety and extend the tool's service life. The cutting tool should in any case be replaced when poor cutting performance starts to affect productivity. The tool changeover procedure is described as follows:

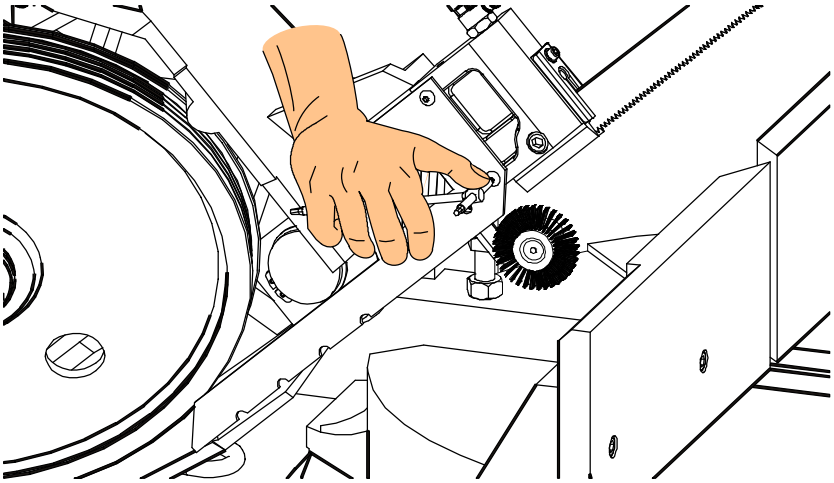
- disconnect the machine from the power supply;
- slacken the blade tension using the handwheel;
- open the cutting head cover by unscrewing the two knobs and hooking it onto the galvanised lever on the back of the head;



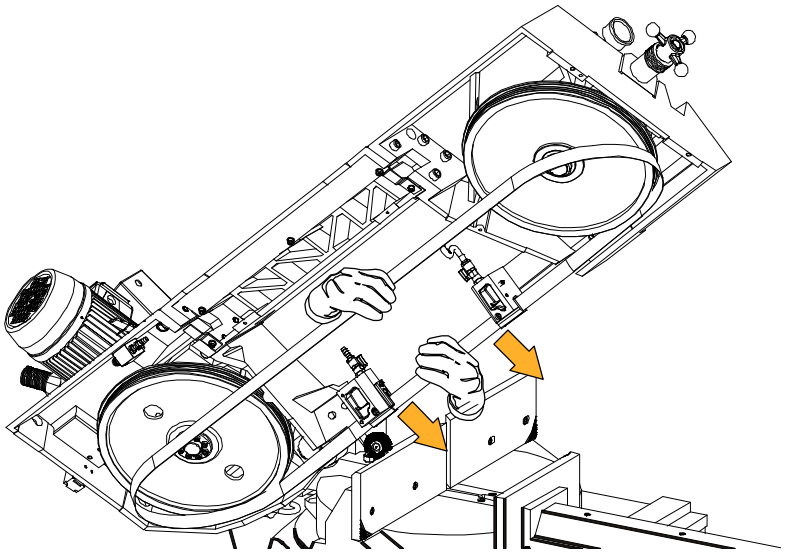
- open the front blade guard by undoing the fixing screw and rotating it as illustrated in the figure below;



- remove the rear blade guard by undoing the two fixing screws using an Allen key;



- wear protective gloves when changing the blade;
- remove the worn blade by sliding it off the flywheels and front and rear heads;
- fit the new blade into the front blade guide head;
- make sure the back of the blade is facing the flywheel stop and that the teeth along the lower part of the blade are inclined towards the head pivot.
- Make sure there is a small amount of play between the blade and guide plate inserts;

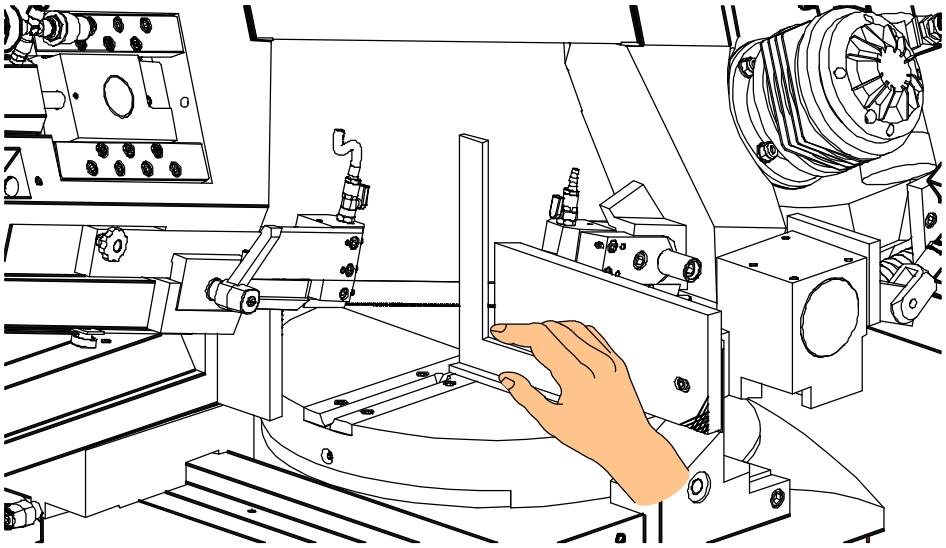


- repeat the above sequence of steps on the rear blade guide head;
- fit the blade on the flywheels and remount the front and rear blade guards;
- close the cutting head cover, correctly tension the blade and power up the machine.

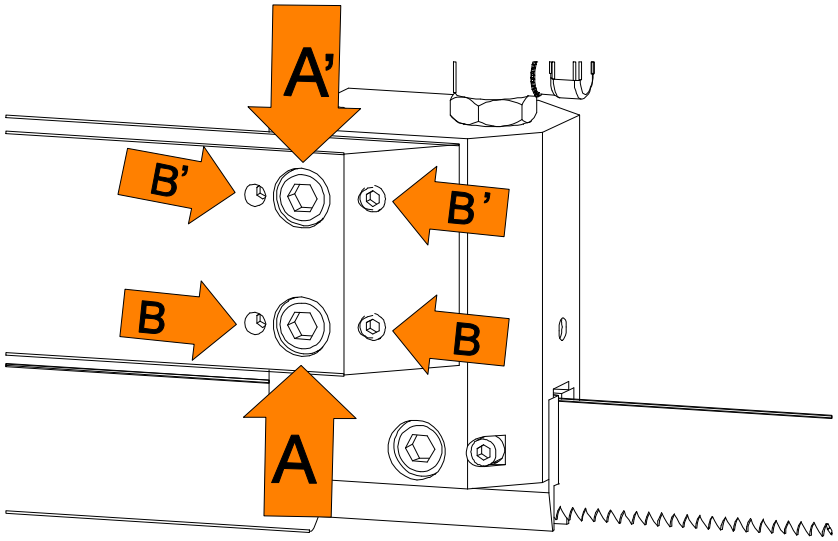
Blade perpendicularity

The perpendicularity of the blade to the work surface, and also the blade tension, are vital for achieving straight cuts. This adjustment is carried out with the help of a workshop square, which should be placed adjacent to the blade resting on the work surface.

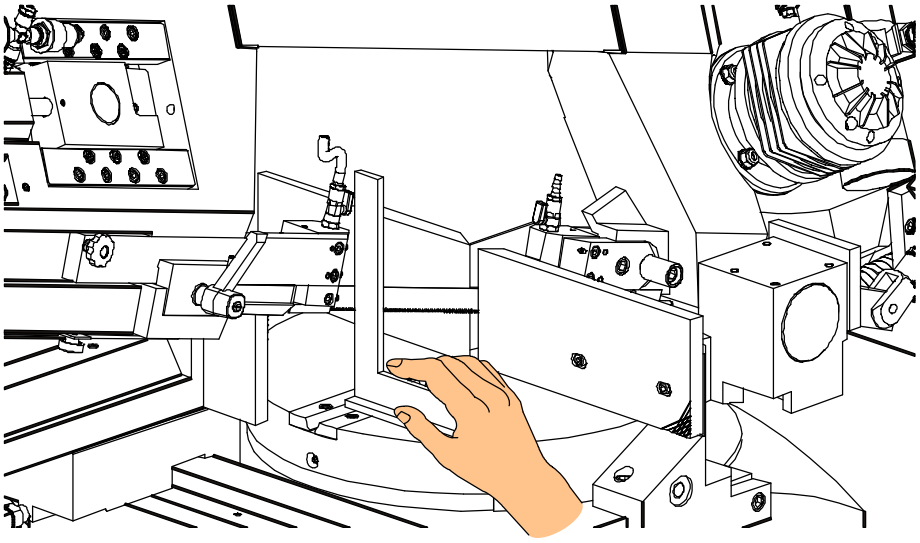
▶ Position the square on the cleaned work surface and rest it against the blade, close to the right vice jaw at a point where the blade teeth do not prevent contact.



▶ Slacken the TCEI head fixing screw (A) and adjust the two grub screws (B) if the blade touches the square at its lower part. If the point of contact is at the upper part, slacken the TCEI screw (A') and tighten grub screws (B') equally until the blade is perpendicular to the square.



▶ Position the square on the work surface close to the front head.



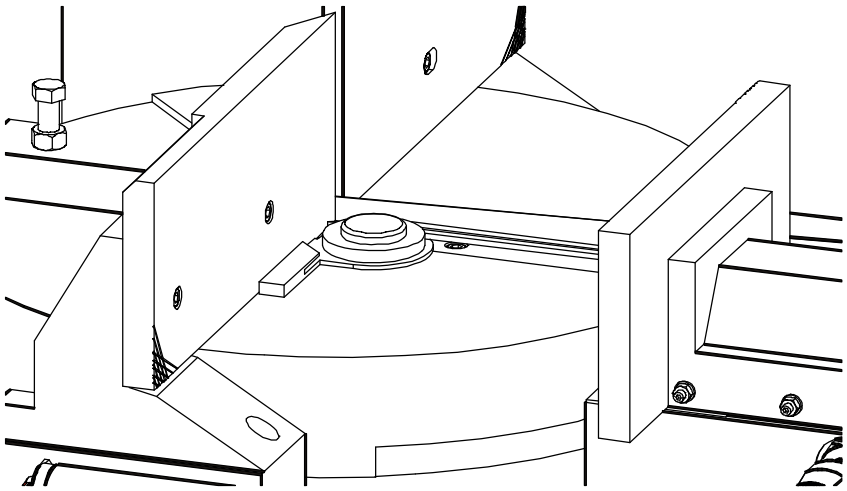
▶ Repeat the squaring operations as for the rear head.

Orthogonality of the blade

The procedure for correcting and adjusting the blade to 0°and 45° right and 45° and 60° left in order to make cuts at right angles to the fixed vice jaw is described below.
To make orthogonal adjustments at 0°, use a workshop goniometer or a simple 90° square. Operation sequence:

▶ lower the head;

▶ position the goniometer or square, resting it on the fixed vice jaw adjacent to the blade;

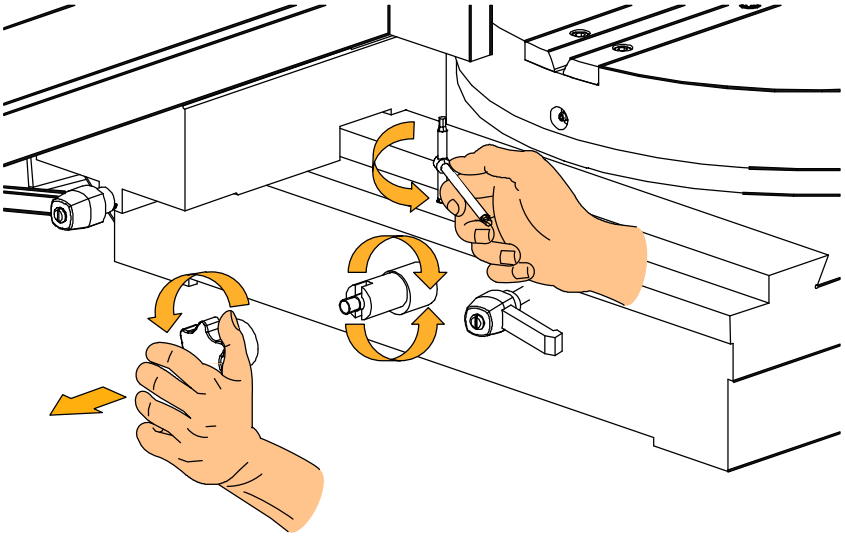


▶ slacken the turntable lock lever;

▶ remove the knob illustrated in the figure below controlling the eccentric lock pin;

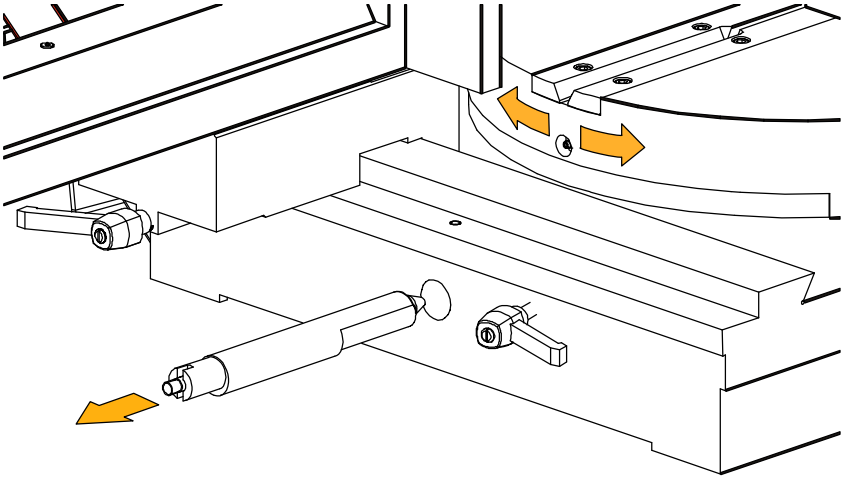
If the degree of error read on the goniometer is equal to or less than 1 degree, proceed as follows:

▶ using an Allen key, slacken the eccentric pin grub screw and rotate it until the error is corrected;



If instead, the degree of error read on the goniometer is greater than 1 degree, proceed as follows:

▶ remove the eccentric pin completely;
▶ turn the head until the error is corrected;



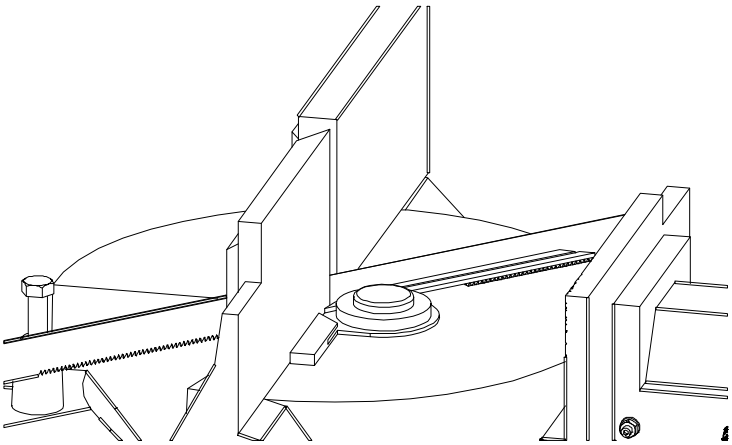
▶ refit the eccentric pin, tighten down the grub screw and remount the knob;
▶ lock the turntable using the lever.

Warning To adjust the 45° and 60° fixed points, you will need a workshop goniometer or an instrument that can measure the exact angle of the blade. This operation can also be performed to adjust the blade to 45° right, since a head angle control pin is also mounted on the left hand side of the work table.

Operation sequence for blade adjustment to 45 degrees:

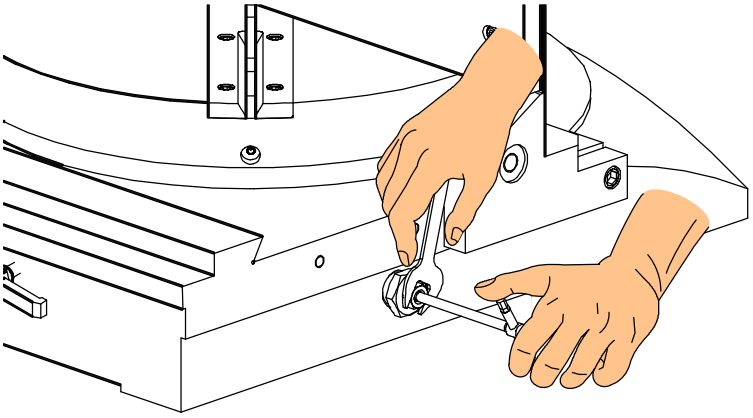
▶ slacken the turntable lock/release lever;
▶ turn the head to 45 degrees (left or right);

▶ position the goniometer on the work table and measure the angle between the vice jaw and blade;



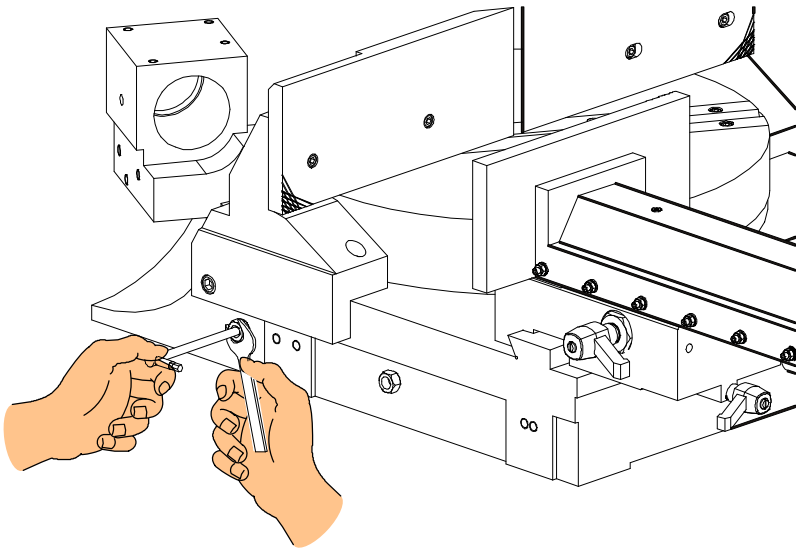
▶ once you have identified the degree of error, adjust the pins by gripping the pin with an Allen key and slackening the lock nut with a normal wrench;

▶ this done, adjust the depth of the pin inside the turntable until the error is corrected;



▶ relock the nut, while gripping the grub screw.

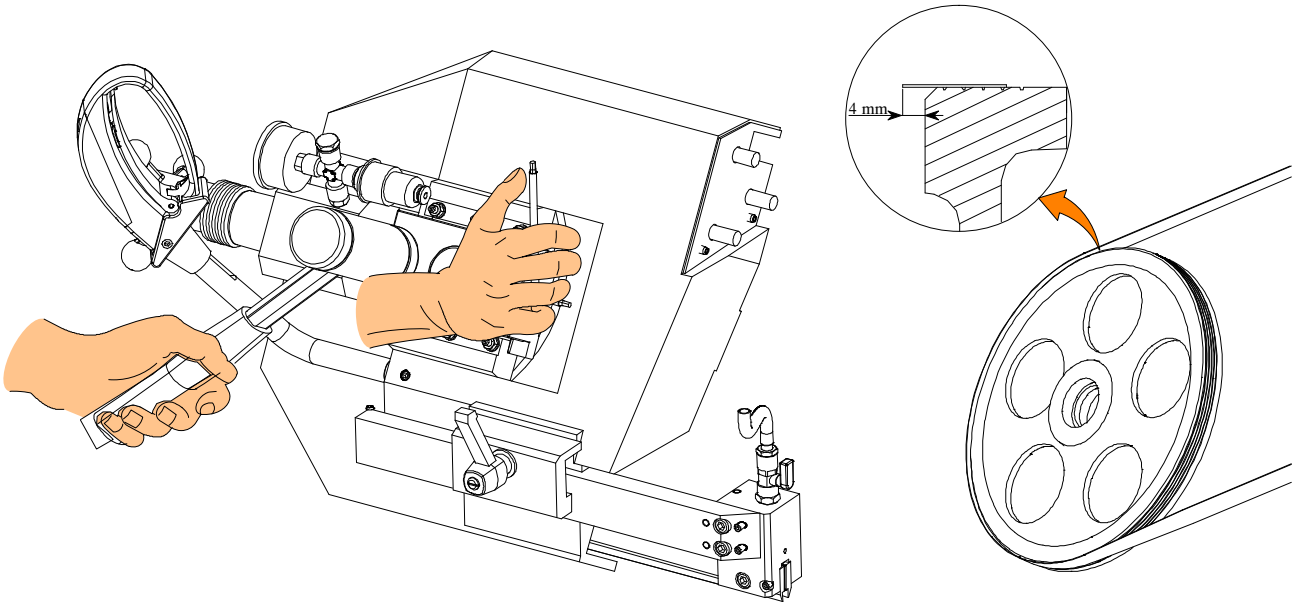
To adjust the blade to **60 degrees left**, proceed as described above for a 45 degree angle, this time however, adjusting the stop indicated in the drawing below.



Rotation axis control

Pulleys must be adjusted in their coplanarity. The adjustment is aimed at ensuring the belt rotation, keeping approx. 4 mm of distance from the point of the belt teeth to the pulley machined surface. This prevents an early wear of the belt.

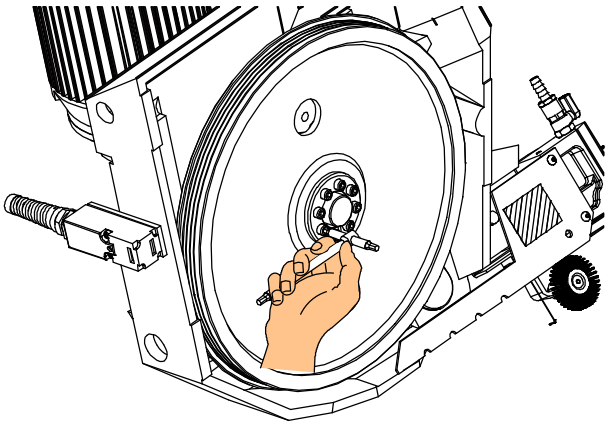
- ▶ Slacken the blade tension and open the cutting head cover;
- ▶ slacken the grub screw and, using a mallet, tap the shaft in or out;
- ▶ finally, close the cover and set the blade in motion;
- ▶ check the distance between the blade and edge of the wheels;



- ▶ if necessary, repeat the operation till getting the correct position.

Rear flywheel alignment is closely linked to adjustment of the front flywheel.

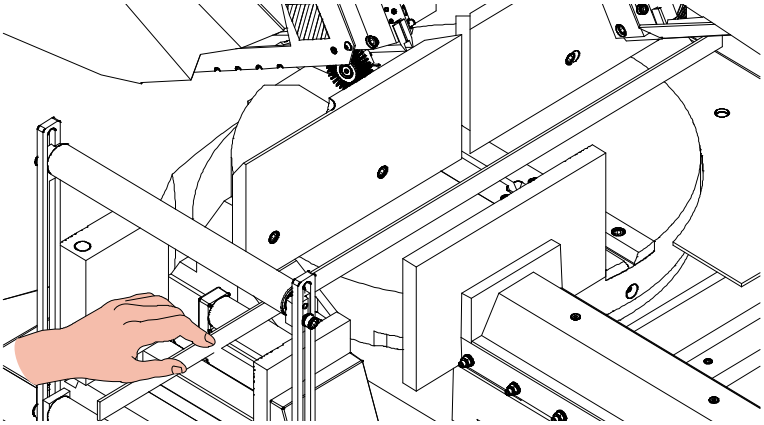
- ▶ Adjust by loosening all pulley locking screws and moving the pulley manually inwards or outwards according to the distance of the blade from the pulley machined surface. Tighten the screws again and check the coplanarity making the belt turn a few times.



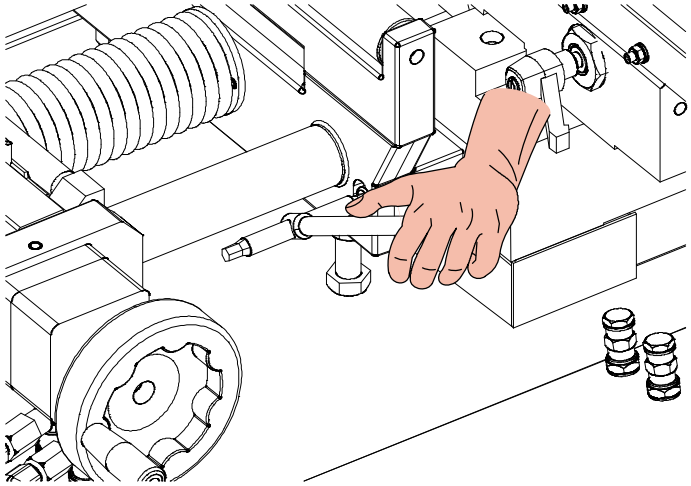
Feeder

Should the feeder at a later stage in time become misaligned with the cutting table, then use the levelling devices located on the side of the machine and the loading table to restore. Misalignment can be measured using a workshop standard ruler or a straight bar section.

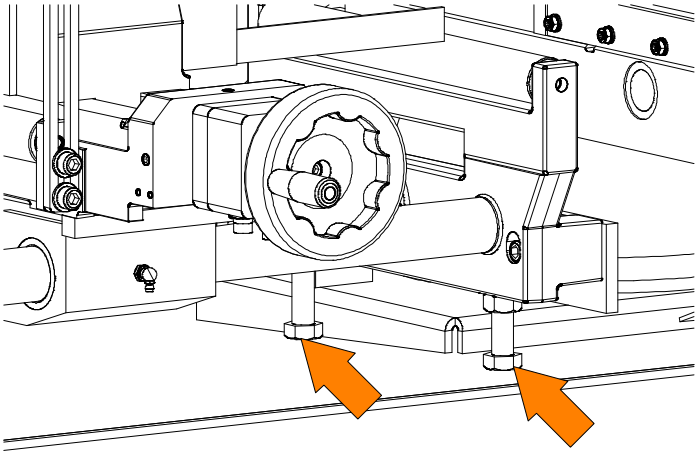
- ▶ Raise the feeder sump;
- ▶ Lay the rule on the feeder to determine the feeder planarity with the cutting plane.



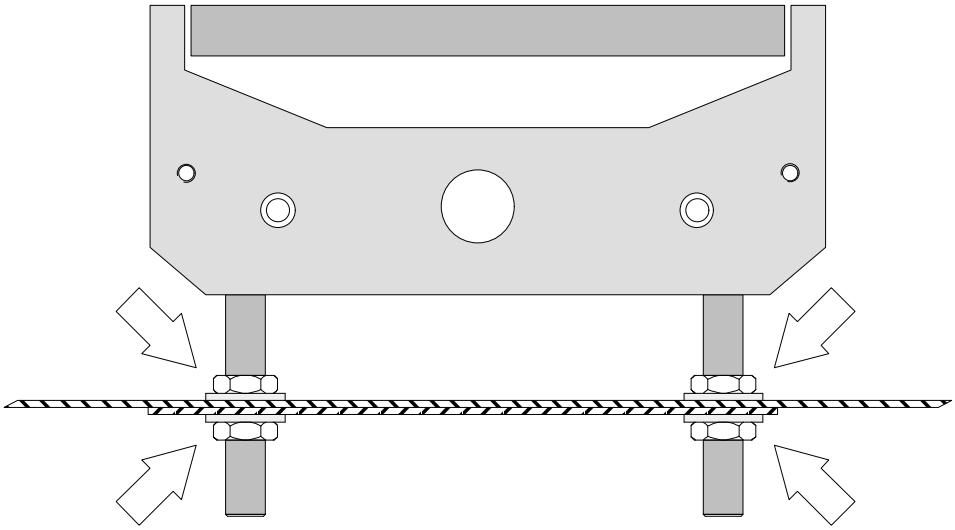
- ▶ If the feeder plane is not coplanar with the cutting plane, remove the feeding shuttle from the platform, then loosen the two socket head screws fastening the feeder.



▶ Considering that the feeder plane must be higher than the cutting plane, to avoid interference with the passage of the cutting material adjust the feet height according to the dimension detected with the rule on the cutting plane, trying to get a height difference of 0.1 mm between the two planes.

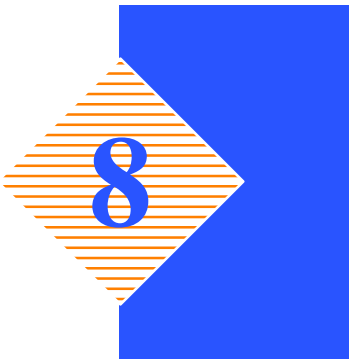


▶ Once the height has been set with a standard ruler near the fixed platform, line up the rest of the feeder using the support pins to adjust as shown in the figure;



▶ open the left door panel on the base to access the adjustment nuts and the 4 support pins;

Maintenance and choice of consumables



SHARK 332–1 NC 5.0 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.
- 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 MEP S.p.A 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.
- 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 (preferably with a non−fibrous cloth);
- empty the swarf drawer (this is located on the right side of the base);
- top up the lubricant/coolant level;

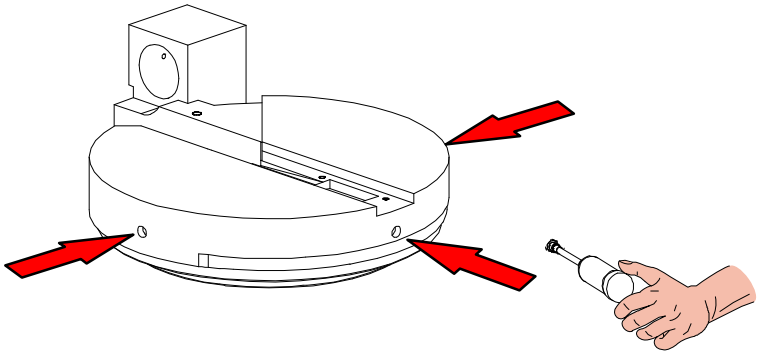


- check state of blade wear and replace if necessary;
- check the blade cleaning brush, clean and relocate; if worn, replace;
- at the end of the working day, slacken the blade to 5 Bar (70 Kg) tension to prevent unnecessary and damaging stress on the machine.

Weekly

The weekly maintenance operations are as follows:

- remove all swarf;
- clean the vice and lubricate all joints and sliding surfaces with a good quality oil;
- check vice sliding; if it is not precise and has transversal play, adjust as instructed in Chapter 7.
- add lubricating oil to the turntable internal circuit, using the ball oiler located at the front of the table;



- clean the air intake vents of the electrical panel: remove the fan and clean the air filter by blasting with compressed air.
- Control the oil level of the hydraulic unit and top up whenever necessary. Check for oil leaks in the hydraulic couplings and that no pipes have been badly bent by accident.

Monthly

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

- check the perpendicularity of the blade to the work surface; if it is necessary to adjust the blade setting, follow the instructions set out in Chapter 7;
- check on blade orthogonality with respect to the workpiece rest shoulder; if adjustment is necessary, proceed as instructed in Chapter 7;
- check that the 0° notch on the work table is in line with the graduation on the turntable; if not, readjust by regulating the 0° stop; then re−check that the blade is perpendicular and orthogonal;
- check the precision of the 45° and 60° left stops and the 45° right stop; if out−of−set, adjust following the steps indicated in Chapter 7;
- check the state of the widia inserts and the blade steady button; replace if worn or chipped; check their positions and adjust if necessary (see Chapter 7);
- check for level alignment between the infeed and the cutting surface and restore if necessary (see Chapter 7);
- thoroughly clean the bottom of the water tank and the electropump filter.

Maintenance of working parts

During maintenance work on the **SHARK 332−1 NC 5.0**, special attention should be paid to the operating parts described in Chapter 7. The worm reduction gear filted on the machine requires no maintenance.

Hydraulic powerpack

Maintenance of the power packs.
After every 1000 working hours:

- check the oil level visually, topping up with compatible oil if necessary;
- check that the pipe couplings are tightened;
- check for any leak.

After every 2000 working hours:

- carry out the same operations scheduled after 1000 working hours;
- check that the filters are clean.

After every 3000 working hours:

- carry out the same operations scheduled after 1000 and 2000 working hours;
- check the life declared in the oil specifications;
- drain the circuit and the tank of the power pack, filter the initial oil charge, if the oil life is still valid;
- drain the circuit and the tank of the power pack, replace the initial oil charge, if the oil life is not valid any more;
- never use cotton or frayed rags to clean the tank;
- clean or replace the filters;
- operate the machine idle for 30 minutes to drain the circuit automatically; at the end, check the oil level e possibly top up.

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.

Oil for transmission box

The machine can be equipped with a worm gear which is permanently lubricated and therefore maintenance−free.
Otherwise, the machine can be equipped with a worm gear having filler cap, level checker and drain to top the oil up if necessary. Below, there is a short list of synthetic oils for permanent lubrication:

BP Energol SG XP220 − KLUBER Syntheso D220EP − ESSO Glycolube Range 220 − IP CT614 − SHELL Tivela Oil SC 320 − FINA Girans.

− transmission box capacity Lt. 0.320

Oils for hydraulic circuit

The hydraulic system of the machine works with FOX YE 32 oil. This oil is used by the head cylinder, vice cylinders, blade tensioning cylinder, and the hydraulic power packs. The following oils may also be regarded as compatible or having equivalent specifications:

API Cis 32 − ARAL Vitam GF 32 − CASTROL Hyspin AWS 32
ESSO Nuto H 32 / HP 32 − IP Hydrus oil 32 − TOTAL Azolla ZS 32
VALVOLINE Hydraulic HLP 32 − MOBIL DTE 24 / 25 / 26
MOBIL Vacuoline Oil 1405 − FIAT HTF 32 − Q8 Haydn 32
SHELL Tellus oil 32 − BP Energol HLP 32

Hydraulic power pack:
− reservoir capacity litres 30

Oil for lubricant/coolant fluid

The oil used for the machine lubricant/coolant fluid is CASTROL Syntolin TFX. Though there are no specific standards for these types of oils, MEP considers that the above product has the best price/quality rapport. The following oils can also be said to have similar characteristics and are therefore compatible:

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

Finally, a lubricant/coolant guaranteed and distributed by a band saw manufacturer (LENOX) is BAND−ADE SAWING FLUID LENOX.

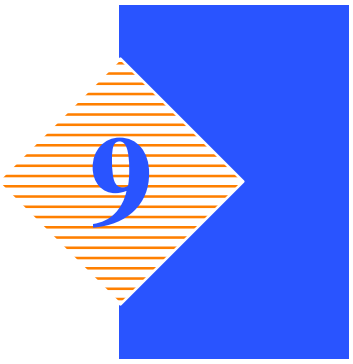
− tank capacity Lt. 120
− oil concentration 5−6 %

Oils for spray mist system (optional)

The oil type used for the machine spray mist system is the cutting oil: Blaser Vascomill F 22.
Though there are no specific standards for these types of oils, MEP considers that the above product has the best price/quality rapport. The following oils can also be said to have similar characteristics and are therefore compatible:

SHELL MACROM 401 F22 − AGIP ESTRAMET F20

Cutting speed and choice of tools



The cutting speed is determined by the blade speed and the head feed speed. While the head speed is provided by the downstroke movement of the head, the blade rotation speed can either be fixed or variable. This chapter describes the cutting speeds the machine can operate at in the standard version, as well as the speeds for which the optional electronic speed controller (inverter) is necessary.

When using the **SHARK 332–1 NC 5.0**, it is important to select the correct type of blade for the material to be cut. This chapter explains the limitations and specific applications of the different types of blades.

Cutting speed

Standard machine

The standard version with 4–pole motor, has a speed range from 15 to 100 m/min. The inverter is an electronic instrument installed on the **SHARK 332–1 NC 5.0**, to control the rpm of the spindle motor. This instrument simplifies special cutting jobs by adjusting the blade rotation speed to suit the kind of material being cut. It thus optimises blade usage, since you can adapt a blade not designed for a specific type of material and avoid premature blade wear.
The inverter's specifications are set out below as listed earlier in the *"Machine specifications"* table in Chapter 1.

Inverter technical specifications	
Protection rating	IP 31
Power	3,0 kW
Vibration and shock resistance (EN50178)	0.6 gn from 10 to 50 Hz 2 gn from 50 to 150 Hz
Max. relative humidity	93% without condensation or drop–forming
Acceptable Temperature Range (EN 50178)	For warehouse storing: from –25° C to +65° C For operating purposes: from –10° C to +40° C
Max. altitude	1000mt. with no derating
Supply	– single phase: 200V – 15% to 240V + 10%
	– three phase: 200V – 15% to 230V + 10% 380V – 15% to 460V + 10%
Frequency	50/60 Hz ± 5%
Output voltage	Maximum voltage equal to the supply voltage
Output frequency range	0,5 – 320 Hz
Max. transients	150% of electronic speed control rated current for 60 secs.

Inverter technical specifications	
Frequency resolution	– Display: 0.1 Hz – Analog inputs: 0.1 Hz per 100 Hz max.
Switching frequency	Adjustable from 2.2 to 12 Hz max.
Electronic speed control protection and safety devices	Galvanic insulation between power and control panel
	Short circuit protection: – of available internal supplies; –between U–V–W output phases between phase and earth for calibres from 5.5 to 15Kw
Motor protections	Thermal protection against overheating and overcurrents
Motor protections	Protection integrated in the electronic speed control with 1^2t calculation
	Protection integrated in the electronic speed control with 1^2t calculation
Motor protections	Protection integrated in the electronic speed control with 1^2t calculation

Choice of blade

When using band saws to cut metals, an important factor is the choice of pitch, i.e. the number of teeth per inch (25.4 mm.), which must be suitable for the workpiece material. The following recommendations may be taken as general guidelines:

- thin–walled materials, such as sheet steel, tubes and profiles require a fine pitch frequency. 3 to 6 teeth should be engaged in the breadth of the material at any one time;
- large section cutting requires a coarse pitch to cope with the higher volume of swarf and optimal tooth penetration;
- soft materials (aluminium alloys, soft bronze etc.) also require a coarse tooth pitch.

Saw tooth pitch

The choice of teeth per inch, therefore, depends on various factors:

- the size of the section;
- the hardness of the material;
- workpiece wall breadth.

Very large dimensions require coarse teeth, while small dimensions require finer teeth. Whatever the case, ensure that there are always at least six teeth engaged in the cut, with reference to the thinnest vertical walls positioned transversally to the blade.
Concerning the type of Shark machine, a first broad distinction can be made according to the hardness of materials:

	Mild steels < 61 HRB < 55 kg/mm^2	Hard steels > 65 HRB > 65 kg/mm^2
	NR. TEETH/INCH	**NR. TEETH/INCH**
MINIMUM	3 / 4	5 / 8
OPTIMUM	4 / 6	6 / 10
MAXIMUM	8 / 12	10 / 14

Cutting speed and downstroke speed

The cutting speed (m/min) and the downstroke speed (cm^2/min) are limited by the heat generated around the points of the teeth. If the downstroke speed is too high, the cut will not be straight, either vertically or horizontally.

The cutting speed depends, as indicated above, on the tensile strength of the material (kg/mm^2), its hardness (HRB) and the thickness of largest sections. The downstroke speed depends on the material thickness. Therefore, large−section, solid or thick−walled materials (s > 5 mm), can be cut at high speeds, providing there is sufficient swarf removal from the blade; thin−walled materials, such as slim piping or profiles, must be cut using low and especially constant downstroke speeds.

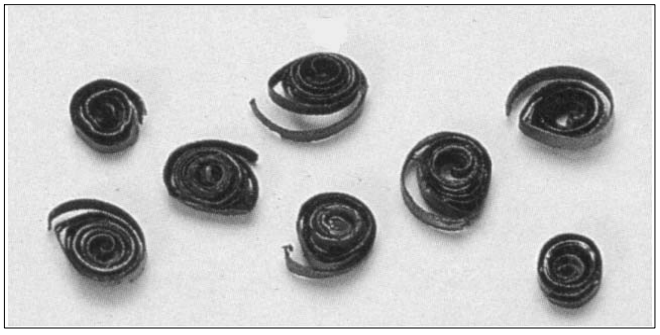
A new blade must be worn in, which in effect means lowering the downstroke speed to about half that of normal (from 60 to 70 cm^2/min on normal steels), equal to a removed surface area of about 300 − 600 cm^2.

Types of swarf:

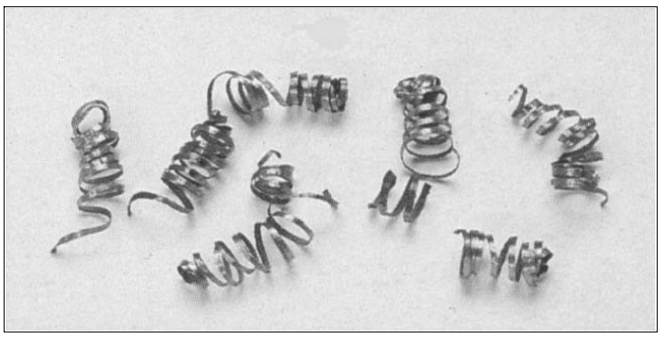
- Very fine or fragmented swarf indicates that the downstroke speed and/or cutting pressure is too low.



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

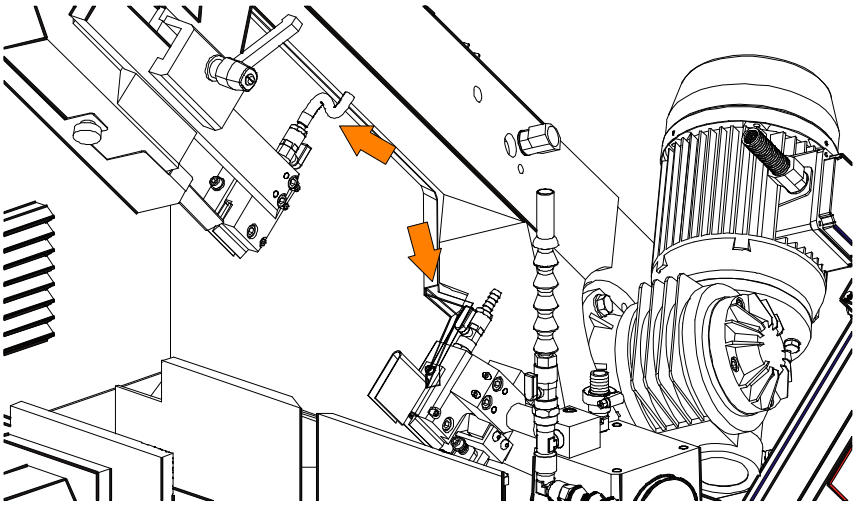


- Long coils of swarf indicate ideal cutting conditions.



Lubricant/coolant fluid

The lubricant/coolant fluid must ensure so that neither the saw teeth nor the work piece material in the cutting zone overheat. Furthermore, there must be a sufficient quantity and pressure of lubricant/coolant to remove swarf from the cutting zone. The lubricant/coolant fluid must be of the highest quality in order to prevent tooth abrasion and welding of swarf to the teeth themselves (seizing).



Blade structure

The most commonly used blades are the bimetal types, i.e. manufactured with a silicon steel body and having a high fatigue strength, and super high−speed steel teeth; the two parts are welded by electronic or laser−welding.

Standardised teeth types are termed M2 and M42; the difference being that M42 teeth are harder due to the addition of cobalt to the steel used to make the teeth.

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

TYPE OF BLADE	*C*	*Mn*	*Si*	*Cr*	*W*	*Mo*	*V*	*Ni*	*Co*	*Al*	*HRC*
	0,47	0,75	0,22	1,00		1,00	0,12	0,52		0,08	45–50
HSS M2 HRC 65–66 / HRC 45–50	0,85	0,25	0,30	4,15	6,37	5,00	1,92				64–66
HSS M42 HRC 67–68 / HRC 45–50	1,07	0,25	0,20	3,75	1,50	9,50	1,15		8,00		67–69

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

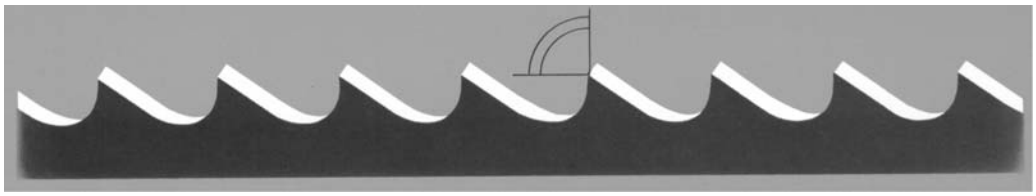
Blade types

The blades mounted on the **SHARK 332–1 NC 5.0** are 3650 x 27 x 0.9 mm.; the length can vary between 3620 mm. and 3680 mm., thanks to the blade tensioner device. The blades, however, apart from size and tooth pitch, are differentiated by other geometrical characteristics which determine their specialised uses:

- tooth cutting angle (rake), can be 0¿ or positive;
- the tooth pitch can be constant or variable;
- the set, i.e. the various teeth alignments, have many possible configurations.

Conventional rake

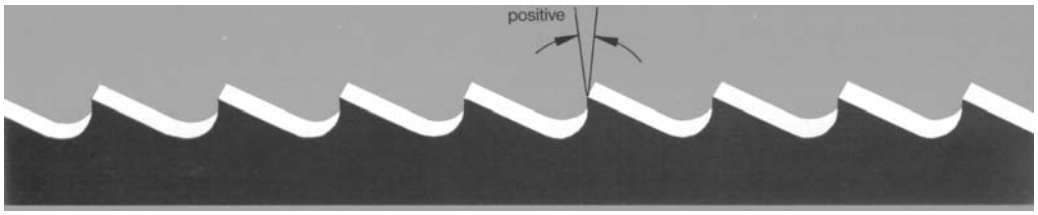
Cutting angle 0°, constant pitch.



In general use, for small or medium section cast iron or steels and rolled materials, for straight or angled cuts.

Positive rake

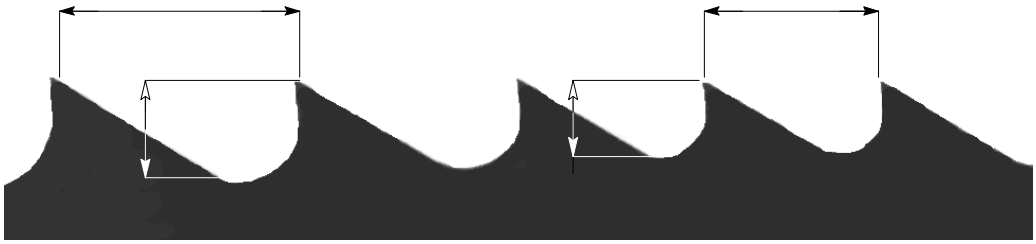
Positive cutting angle 9–10°, constant pitch.



Can be used for cutting all types of materials, and is particularly suited to low–carbon and non–ferrous steels. Used for cutting very large sections and diameters.

Variable pitch

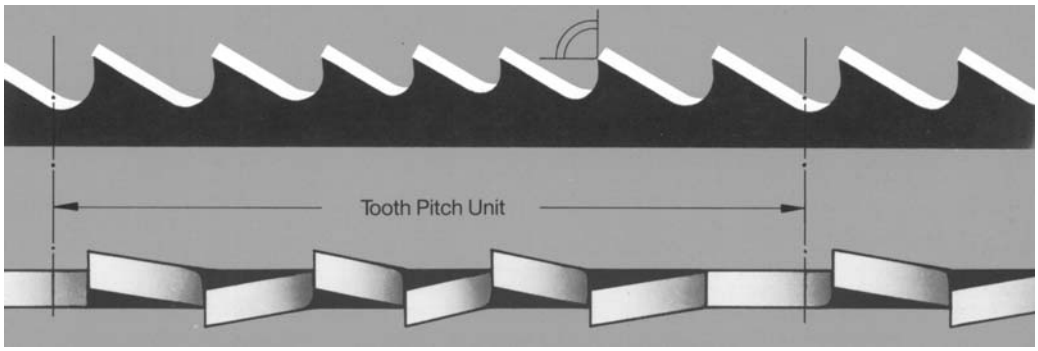
These blades have groups of teeth having different pitches and, as a consequence, have various tooth dimensions and differing relief angles. These are also available in M2 and M42 types with zero and positive rakes. The alternation of the different types of teeth helps to prevent vibration and noise. Elimination of vibration increases the useful life of the tool and improves the cut surface finish.



A further advantage in using these types of blades lies in the fact that a wide range of different material types and dimensions can be cut with the same blade.

Variable pitch blades with 0° cutting angle

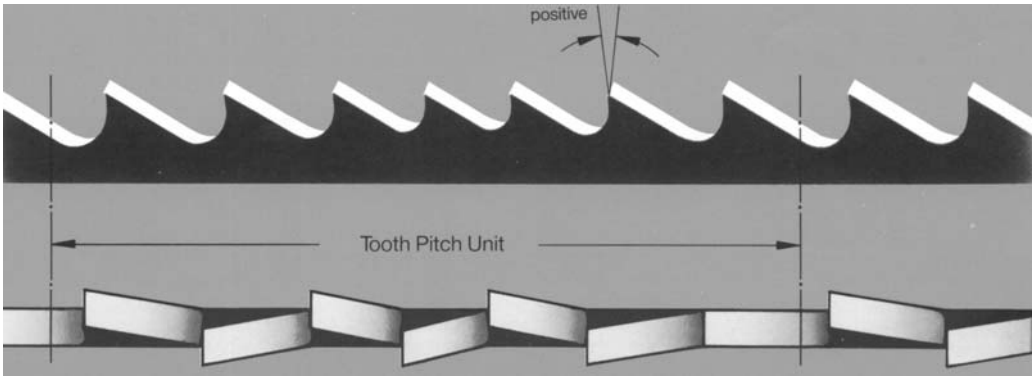
This type of tooth formation is ideal for cutting single pipes or medium size bundles, in accordance with the capacity of the machine.



Pitches available: 3–4 / 4–6 / 5–7 / 5–8 / 6–10 / 8–12 / 10–14.

Variable pitch with positive rake (from 9 to 10 degrees)

This toothing type is the most suitable for cutting large dimension pipes and profiles, including large sections, as well as for cutting solid sections up to the machine capacity limit.



Pitches available: 3–4 / 4–6.

Set:

The term set refers to the section of material removed by the blade during the cutting operation, i.e. relating to width of cut and the offset position of the teeth with respect to the blade back.

Standard or splayed set

This term is used to describe an alternated angling of the teeth: one to the right, one to the left and one straight.



For general use on materials over 5 mm. thick. Suitable for cutting steels, castings and non–ferrous hard materials.

Undulated set

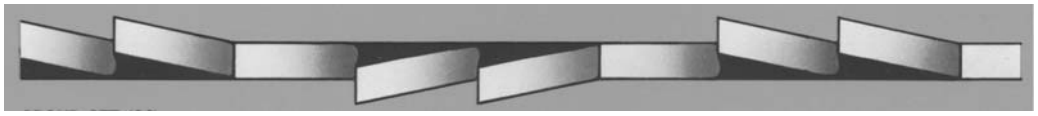
Used to describe groups of teeth undulating alternatively to the right and left.



This type of set is used with very fine teeth for cutting thin pipe walls and small−section profiles (from 1 to 3 mm).

Alternating grouped sets

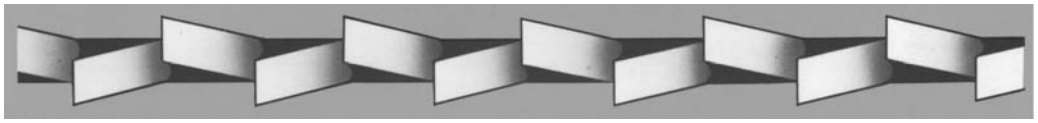
These are groups of teeth angled to the right, one straight tooth, then a further group angled to the left.



This set is used for very fine teeth for cutting very thin sections (less than 1 mm).

Alternating set

This set is one tooth to the right followed by one to the left.



This set is used for soft non−ferrous materials, plastics and wood.

Blade selection table relating to cutting speed and downstroke speed

Cutting material	Cutting speed mt./min	Dimensions of the cutting section S (mm)												Lubrication	sq. mt./min. cut
		S10		10S30		30S50		50S80		80S120		120S230			
Structural steel Casehardened steel Steel for turning Mild steel	50 / 70	14	10 / 14	10	10 / 14	8	6 / 10	6	5 / 8	4	4 / 6	3	3 / 4	Emulsible oil Cutting fluid	60 – 70
High–duty cast iron Rolled steel Spring steel	40 / 50	14	10 / 14	10	10 / 14	8	6 / 10	6	5 / 8	4	4 / 6	3	3 / 4	Emulsible oil	50 – 60
Alloy steel Tool steel Valve steel	30 / 40	14	10 / 14	10	10 / 14	8	6 / 10	6	5 / 8	4	4 / 6	3	3 / 4	Emulsible oil Cutting fluid	15 – 20
Stainless steel Nodular cast iron	30 / 40	14	10 / 14	10	10 / 14	8	6 / 10	6	5 / 8	4	4 / 6	3	3 / 4	Emulsible oil	15 – 20
Copper Soft bronze	90 / 150	14	10 / 14	10	10 / 14	6	5 / 8	4	4 / 6	3	3 / 4	3	3 / 4	Emulsible oil	75 – 90
Brass	90 / 300	14	10 / 14	10	10 / 14	6	5 / 8	4	4 / 6	3	3 / 4	3	3 / 4	Emulsible oil	80 – 90
Hard bronze	20 / 40	14	10 / 14	10	10 / 14	6	5 / 8	4	4 / 6	3	3 / 4	3	3 / 4	Emulsible oil	25 – 40
Aluminium	80 / 800	14	10 / 14	6	10 / 14	4	4 / 6	3	3 / 4	3	3 / 4	3	3 / 4	Emulsible oil	70 – 80
Plastics	90 / 400	14	10 / 14	6	10 / 14	4	4 / 6	4	4 / 6	3	3 / 4	3	3 / 4	Emulsible oil	80 – 90

Blade pitch **Number of teeth per inch**

Classification of steels

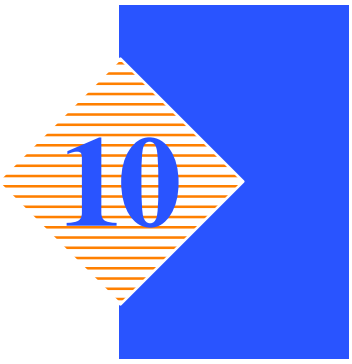
This page provides a table giving the user specific information on the cutting materials, in order that they can be classified on the basis of their hardness, and thus the correct tool can be selected for the task in hand.

Types of steel				Hardness		
UNI	DIN	BS	AISI	Brinell HB	HRB	Kg/mmq
C 22 – C 35	CK 22 – CK 3	En 2 C – En 6	1022 – 1035	160 – 170	34 – 87	55 – 59
C 45	CK 45	En 8	1040	160 – 180	84 – 89	55 – 61
C 10 – C 15	CK 10 – CK 15	En 32 C – En 328	1010 – 1015	150 – 175	81 – 87	51 – 59
C 60	CK 60	En 9	1060	160 – 180	84 – 89	55 – 61
		4360 – 50 A		160 – 180	84 – 89	55 – 61
	17100	3706 – 1.2.3.	ASTMA – 36/68	160 – 180	84 – 89	55 – 61
45 Cr Si 9	17115	4360		160 – 180	84 – 89	55 – 61
		En 20 A		190 – 215	91 – 97	64 – 73
34 Cr Mo 5	17221	970 – 1955	1065	180 – 205	89 – 94	61 – 69
		En 18 B	5135 – 5145	180 – 200	89 – 93	61 – 67
35 Cr Mo 4	34 Cr Mo	En 19 B	4135	200 – 230	93 – 99	67 – 77
	36 Ni Cr 6	En 111	3135	190 – 230	91 – 99	64 – 77
		En 36	3310 – 3315	200 – 230	93 – 99	67 – 77
20 Nc Cr Mo 2		En 362	4315	200 – 225	93 – 98	67 – 75
		En 100 D	8645	190 – 220	91 – 97	64 – 74
	1880 X C 95	DX	W 1	150 – 190	80 – 91	51 – 64
100 Cr 6	100 Cr 6	En 31	52100	210 – 230	96 – 99	71 – 77
		B 2	L 6	190 – 230	91 – 99	64 – 77
52 Nc Cr Mo KU	56 Ni Cr Mo V 7			217 – 248	97 – 102	73 – 83
	2750 (280W18)	18 % W	T 1	217 – 248	97 – 102	73 – 83
		1507 – 825	1310	160 – 220	84 – 91	55 – 64
		A 2	M 13	200 – 230	93 – 99	67 – 77
	210 Cr 46	A 1	D 3	215 – 240	97 – 101	73 – 81
	4845	En 58 G	309 S	150 – 200	80 – 93	51 – 67
X 12 Cr 13	4001	En 56 A	410	150 – 200	80 – 93	51 – 67
X 6 Cr Ni 1810	4301	En 58 E	304	130 – 170	74 – 86	45 – 58
X Cr Ni 1910						
X 8 Cr Ni Mo 1713	4401	1501 – 845	316	160 – 200	84 – 93	55 – 67
Phosphor bronze				60 – 100	56,5	36
Aluminium bronze				70 – 90	49	32
Manganese bronze				95 – 120	51 – 69	34 – 42
Silicon bronze				70 – 100	56,5	36

Classification of steels

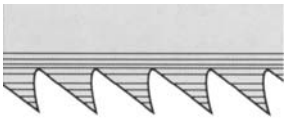
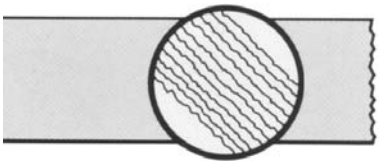
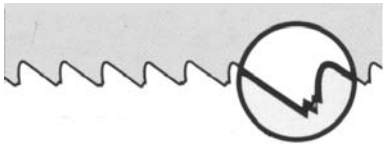
Material	SS Svezia	AISI U.S.A.	DIN Germania	BS Inghilterra	UNI Italia	AFNOR Francia
Carbon steels	1311	1015 – 1035	C 22 – C 35	050 A 20	C 15 – C 35	XC 18
			20 Mn 5 – 28 Mn 6	080 M 46 – 50	C 22 Mn	XC 38 H 1
	1572		CK 22 – CK 50	120 M 19	C 28 Mn	20 M 5
				150 M 28		
Carbon steels	1650	1040 – 1064	CK 60 – CK 101	060 A 40 – 060 A 96		XC 60 – XC 75
			36 Mn 5	070 M 55		40 M 5
	1880	1770 – 1880	Cm 45 – Cm 55	080 A 40 – 080 A 62	C 45 – C 60	XC 42 H 1
						XC 55 H 1
Alloy steel	2120	1335 – 1345		1717 CDS 110		25 CD 4
			25 Cr Mo 4 – 42 Cr Mo 4	708 A 37	25 Cr Mo 4 – 42 Cr Mo 4	
	2255	4130 – 4140		708 M 40		42 CD 4
Alloy steels	2541	4337 – 4340	40 Ni Cr Mo 6	735 A 50, 534 A 99	40 Ni Cr Mo 2 – 40 Ni Cr Mo 7	35 NCD 6
	2230	50100 – 52100	40 Ni Cr Mo 73	817 M 40	30 Ni Cr Mo 8 – 35 Ni Cr Mo 6 KB	50 CV 4
	2258	6145 – 6152 8630 – 8645	34 Cr Ni Mo 6, 100 Cr 6	311 rodzaj 6, 7	50 Cr V 4, 100 Cr 6	100 C 6
Tool steels	2310 – 12	D – 2, D – 3	X 210 Cr 12	BD 2, BD 3	X 205 Cr 12 KU	Z 160 CVD 12
	2754 – 55		X 155 Cr V Mo 121		X 155 Cr V Mo 121 KU	Z 200 C 12
Tool steel	2550	S – 1	60 W Cr V 7	BS 1	55 W Cr V 8 Ku	55 NCVD 7
	2710		55 Ni Cr Mo V 6		55 Ni Cr Mo V 6	
Stainless steels	2324	201, 202	X 2 Cr Ni 189	304 S 15	X 2 Cr Ni 18.11	Z 2 CN 18.10
	2333	302, 304	X 5 Cr Ni 189	304 C 12	X 5 Cr Ni 18.10	Z 6 CN 18.09
			G – X 2 Cr Ni 189	304 S 12	G – X 2 Cr Ni 19.10	Z 3 CN 19.10
Stainless steel	2343	314, 316	X 15 Cr Ni Si 2520	316 S 16	X 16 Cr Ni Si 2520	Z 12 CNS 25.20
			X 5 Cr Ni Mo 1812		X 5 Cr Ni Mo 1713	
	2353	317	X 5 Cr Ni Mo 1713	317 S 16	X 5 Cr Ni Mo 1815	Z 6 CND 17.12

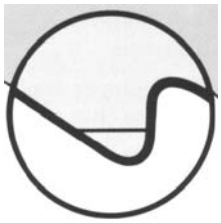
Troubleshooting

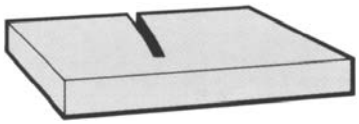


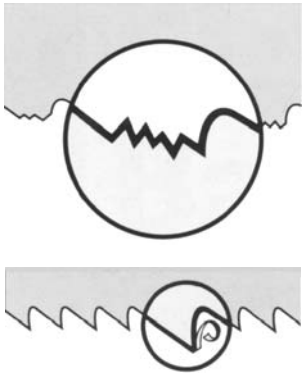
This chapter describes the inspection and troubleshooting procedures for the **SHARK 332–1 NC 5.0**. Regular inspections and efficient maintenance are essential to ensure your machine gives you a long, trouble–free service life. The chapter is divided into two sections: the first being dedicated specifically 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.

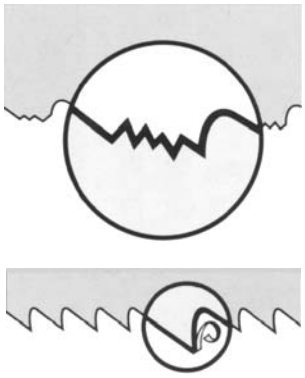
Troubleshooting blade and cutting problems

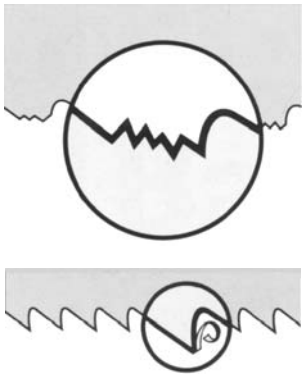
PROBLEM	PROBABLE CAUSE	SOLUTION
Blade scored or scratched 	◗ Widia inserts chipped or worn	☞Replace
	◗ Widia inserts loose or tight	☞Adjust
	◗ Widia inserts dirty	☞Clean and re–adjust correctly
Cutting surfaces scored  	◗ Blade teeth worn	☞Replace blade
	◗ Head downstroke speed too fast	☞Reduce downstroke speed
	◗ Cutting speed too slow	☞Increase cutting speed
	◗ Blade teeth too wide	☞Change for wider teeth
	◗ Free blade guide head too far away	☞Move blade guide head closer so as to leave only that part of the blade free which is needed to effect the cut
	◗ Blade tension low	☞Reset tension to rated tension
	◗ Broken teeth on blade	☞Check and replace blade

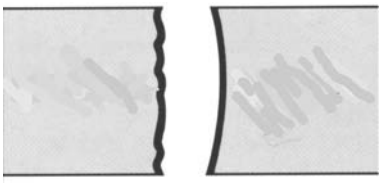
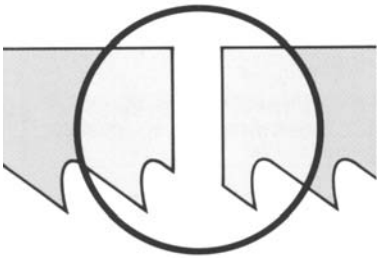
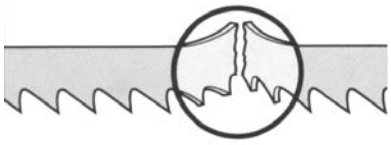
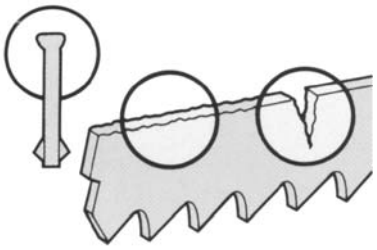
PROBLEM	PROBABLE CAUSE	SOLUTION
Rapid tooth wear 	◗ Teeth pointing in the wrong direction	☞Set teeth in correct direction
	◗ Blade worn in wrongly	☞With a new blade cutting should be done at half–speed and with downstroke speed also at half normal speed. After the blade has been worn in (about 300 cm^2 of work for hard cutting materials and about 1000 cm^2 for soft cutting materials) the cutting and downstroke speeds can be brought up to rated levels
	◗ Material too hard	☞Check cutting speed, downstroke speed and blade pressure, as well as type of band saw being used
	◗ Material defective	☞Surface defects: oxides, sand, surface hardening. Hardened inclusions in section. Reduce cutting and downstroke speeds or clean surface.
	◗ Cutting speed too high	☞The teeth slide on the material without cutting: reduce cutting speed
	◗ Head downstroke speed too slow	☞The band saw runs over the material without removing it: increase downstroke speed
	◗ Insufficient coolant	☞Check coolant level and clean pipes and jets
	◗ Incorrect fluid concentration	☞Check and use the correct concentration
	◗ New blade inserted into a partially–made cut	☞The cutting surface might have been subject to a localised heat–induced alteration, making it harder: recommence cut using a slower cutting and downstroke speed. There may be a broken tooth from the old blade lodged in the cut: check and remove before recommencing work
	◗ Flutter	☞Blade tension too low: tighten. Tooth shape or pitch unacceptable: change type of blade used. Widia blade steady buttons too far from the blade back: adjust guide heads, rotating them slightly to bring them closer to the blade back.

PROBLEM	PROBABLE CAUSE	SOLUTION
Cuts not orthogonal or inclined 	◗ Head downstroke speed too fast	☞Reduce head downstroke speed
	◗ Widia inserts worn	☞Replace
	◗ Inserts loose	☞Adjust width
	◗ Blade guide head positioned wrongly	☞Move mobile head up to the workpiece using the guide plate to leave free only that part of the blade actually needed to make the cut
	◗ Orthogonality of blade to workpiece rest shoulder	☞Check and realign the blade guide heads, then reset the blade orthogonality with the shoulder using the adjustment pin at 0°; then set the stops at 45° right and left by means of the appropriate screws
	◗ Perpendicularity of the blade to the work surface	☞Check and realign the blade guide heads then adjust the blade using the appropriate screws so that it is perpendicular to the work surface
	◗ Blade tension incorrect	☞Bring pressure up to 60 Bar
	◗ Blade worn	☞Replace blade
	◗ Tooth pitch unsuitable	☞Probably a blade with too many teeth per inch is being used; change for a coarser blade
	◗ Cutting speed too slow	☞Increase the cutting speed
	◗ Wrong coolant	☞Check the water and oil emulsion; check that none of the holes or hoses are blocked; direct the jets correctly
	◗ Broken teeth	☞Check the hardness of the material being cut

Broken teeth 	◗ Cutting speed too high	☞Reduce cutting speed
	◗ Downstroke speed too high	☞Reduce downstroke speed

PROBLEM	PROBABLE CAUSE	SOLUTION
Broken teeth 	◗ Cutting pressure too high	☞Check and set to correct pressure
	◗ Tooth pitch unsuitable	☞Teeth too close together: change blade for one with a coarser tooth pitch
	◗ Swarf welded to teeth and gullets	☞Check blade–cleaning coolant jets. Check the blade–cleaning brush. If the swarf is not removed from the blade it will be drawn back into the cut and weld to the teeth, causing tooth breakage
	◗ Swarf welded to teeth and gullets	☞Check blade–cleaning fluid jets. Check blade–cleaning brush. If the swarf is not removed from the blade it will be drawn back into the cut and weld to the teeth, causing the teeth to break.
	◗ Material defects	☞The material may have altered surface areas, such as oxides or sand, or subcooled inclusions in the section. These areas are much harder than the blade and will cause the teeth to break: scrap or clean these materials.
	◗ Workpiece not clamped	☞The blade may break if the workpiece moves during cutting: check the vice, jaws and clamping pressure
	◗ The blade stops in the cut	☞Cutting pressure too high: check and restore to rated pressure. Downstroke speed too fast: reduce speed. Cutting speed too slow: increase. The blade slips on the flywheels: either the wheels are worn and need to be replaced or the blade tension is incorrect (too low) and must be re–adjusted.
	◗ New blade inserted in a partially made cut	☞The cutting surface may have been subjected to a localised heat–induced alteration, making it harder: recommence cut using a slower cutting and downstroke speed. A tooth from the old blade may be left in the cut: check and remove before restarting work.

PROBLEM	PROBABLE CAUSE	SOLUTION
Broken teeth 	◗ Widia inserts positioned incorrectly	☞Adjust the position of the inserts, especially the width, since blade thicknesses can exceed the manufacturer's declared tolerance ratings
	◗ Widia blade steady buttons	☞Two widia blade steady buttons are located in the top of the blade guide heads which press on the back of the blade to transmit cutting pressure. If these buttons are too far from the blade, the blade may be prone to an up and down undulating action or abnormal vibrations, liable to cause the teeth to break: adjust the position of the heads by rotating them downwards so as to bring the blade steady buttons up against the back of the blade
	◗ Sections with large thickness variations	☞The cutting speed and downstroke speed must be chosen to suit the most critical part of the cut
	◗ Teeth angled in the wrong direction	☞Fit blade so that teeth point in the right direction
	◗ Blade run in wrongly	☞When using a new blade, the cutting and downstroke speeds must be reduced to half the normal operating speed. After the blade has been worn in (about 300 cm2 for hard materials and about 1000 cm2 for soft materials) the cutting and downstroke speeds may be returned to their rated levels
	◗ Insufficient coolant	☞Check coolant level and clean fluid lines and jets
	◗ Incorrect fluid concentration	☞Check and use the correct concentration
	◗ Blade tension too high or too low	☞Check and reset to rated tension

PROBLEM	PROBABLE CAUSE	SOLUTION
Blade path fault 	◗ Front flywheel position incorrect	☞Check that the band saw is correctly positioned on the flywheel. Adjust the position of the flywheel under the blade, moving the shaft of the flywheel
	◗ Flywheels worn	☞Replace
	◗ Gaps full of swarf	☞Clean inside machine using blown air.
	◗ Blade guide head alignment	☞Check and adjust
Blade broken    	◗ Cutting speed too high	☞Reduce cutting speed
	◗ Head downstroke too fast	☞Reduce head downstroke speed
	◗ Cutting pressure too high	☞Check and set to correct pressure
	◗ Tooth pitch unsuitable	☞Teeth too close together: change the blade for one with coarser tooth spacings
	◗ Workpiece not clamped properly	☞The blade may break if the workpiece moves during cutting: check the vice, jaws and clamping pressure.
	◗ Widia inserts positioned incorrectly	☞Adjust inserts position, especially the width, since blade thickness can exceed the manufacturer's declared tolerance ratings
	◗ Widia blade steady buttons	☞Can have a milling action on the back of the blade if worn or chipped, causing cracks from the back towards the teeth.
	◗ Position of blade on flywheels incorrect	☞The blade may be scraping on the edges of the flywheels: this problem is generally caused by blades which are deformed or wrongly welded (conical) Adjust the position of the front flywheel by moving the pin, or change the blade
	◗ Blade tension incorrect	☞If the blade tension is too high or too low, the blade will be subjected to abnormal stress: set the tension back to the rated value.

PROBLEM	PROBABLE CAUSE	SOLUTION
	◗ Blade weld fault	☞The point at which a blade is welded is its most critical point; problems could be caused by welds which are not aligned perfectly or have inclusions or blowholes
	◗ Free blade guide head	☞The head is too far away from the workpiece: move the head closer, leaving free only that part of the blade actually needed to make the cut
	◗ Teeth in contact with the material before starting the cut	☞Always check the position of the blade before starting a new job, especially for the semi–automatic cycle
	◗ Widia inserts	☞If worn, the inserts can score the blade, weakening it even to breaking point. If the inserts are too far apart, the blade will whip, striking both the inserts and the material. Replace or adjust
	◗ Insufficient coolant	☞Check coolant fluid level; clean pipes and jets
	◗ Incorrect fluid concentration	☞Check and use the correct concentration
	◗ The blade stops in the cut	☞Cutting pressure too high: check pressure and reset to rated pressure. Head downstroke speed too fast: reduce. Head downstroke speed too slow: increase. The blade slips on the flywheels: incorrect or low blade tension; readjust or increase.

Troubleshooting

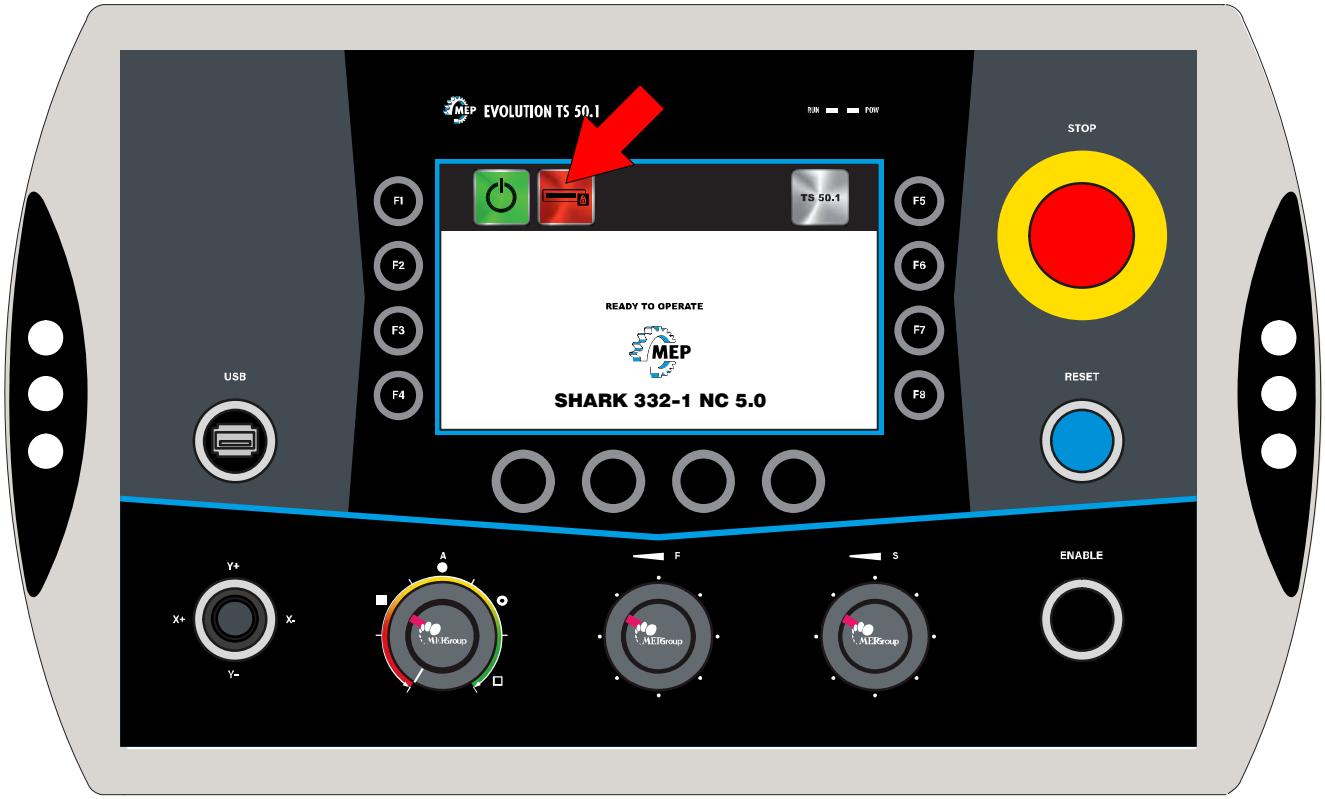
This section deals with the problems which may occur during machine operation. The MEP 50 controller allows you to test all the machine's electric and electronic devices by checking the status of the input and output signals on the IUD/IUV card (see Chapter 5).

The board IUD/IUV is inside the electric board.

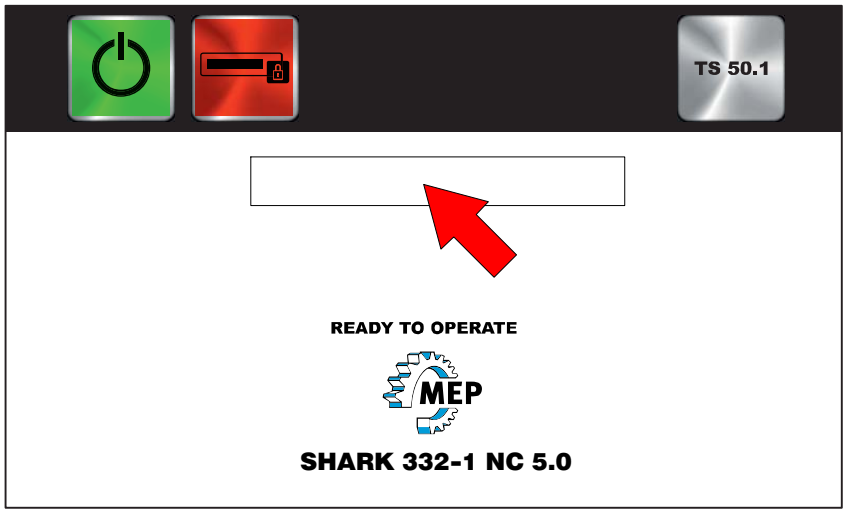
Displaying the diagnostics menu

Attention The access to this function is reserved solely to the service technicians.

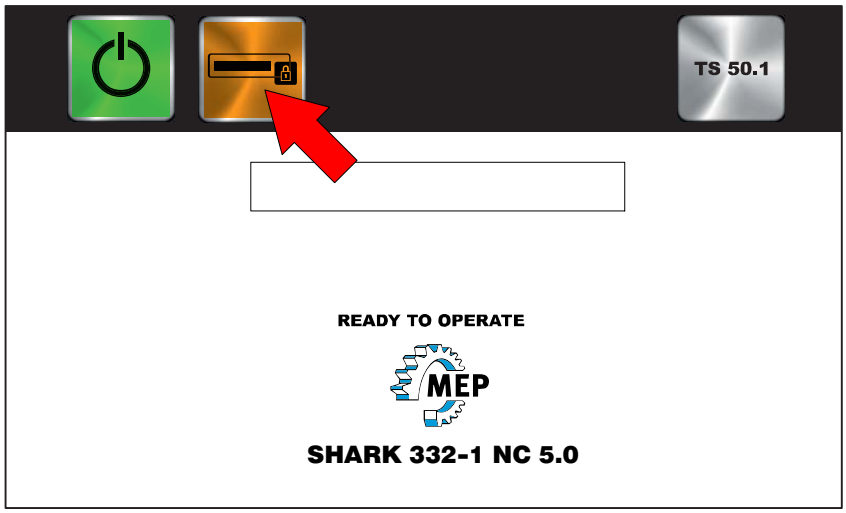
- ▶ Power the machine by turning the main switch on the left of the control board.
- ▶ Tap on the box on the touchscreen shown in the figure.



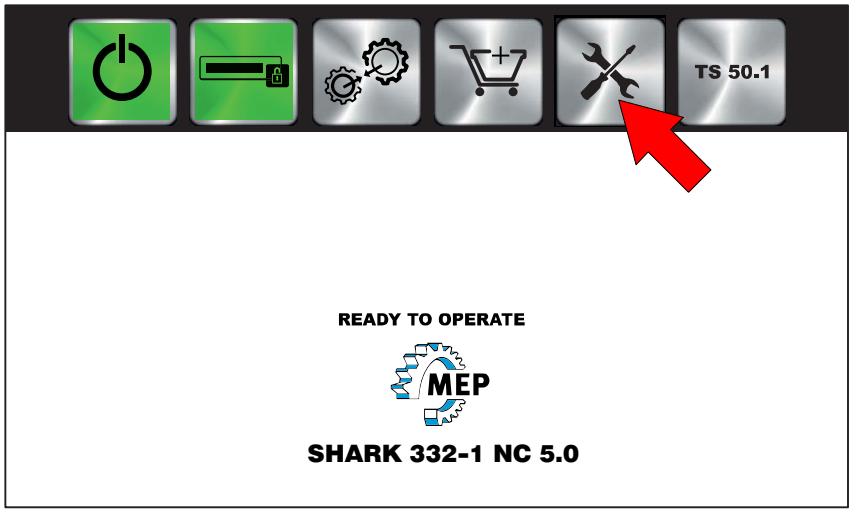
▶ The password entry box will open. Tap the box to open the keypad.



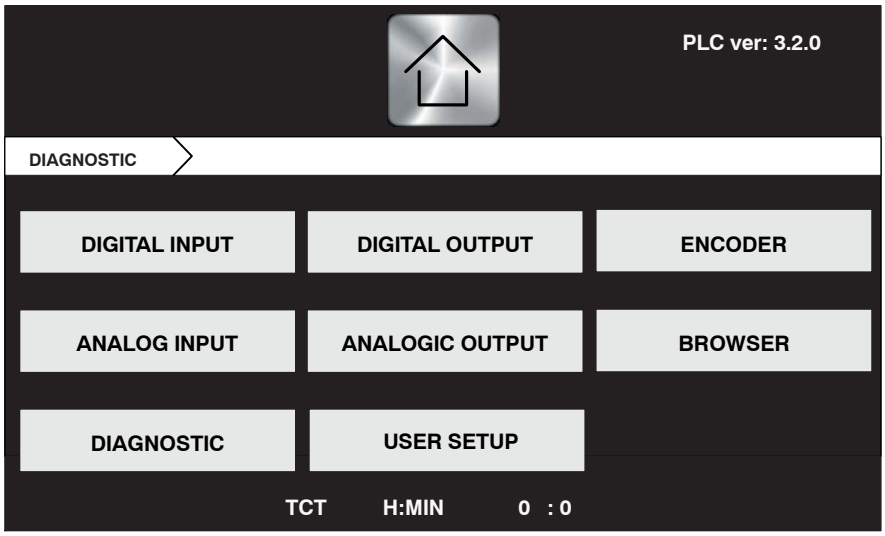
▶ Tap on the box shown in the figure.



▶ 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:

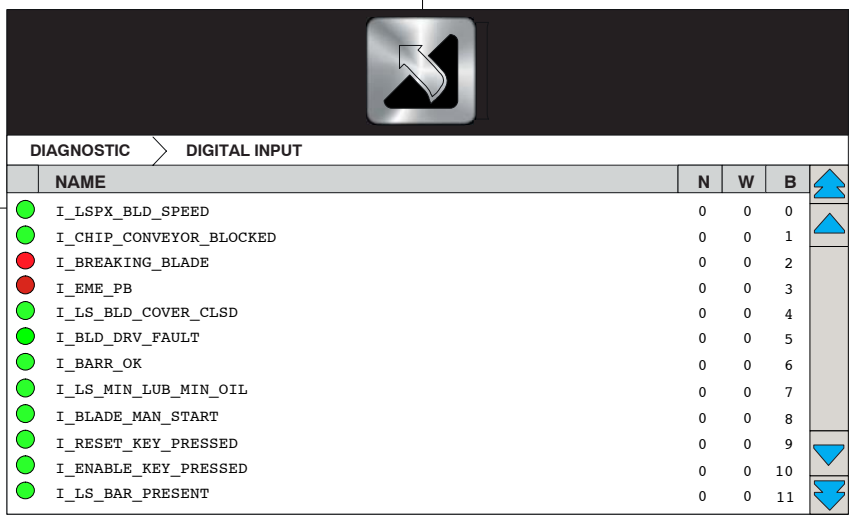


Digital Input

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)



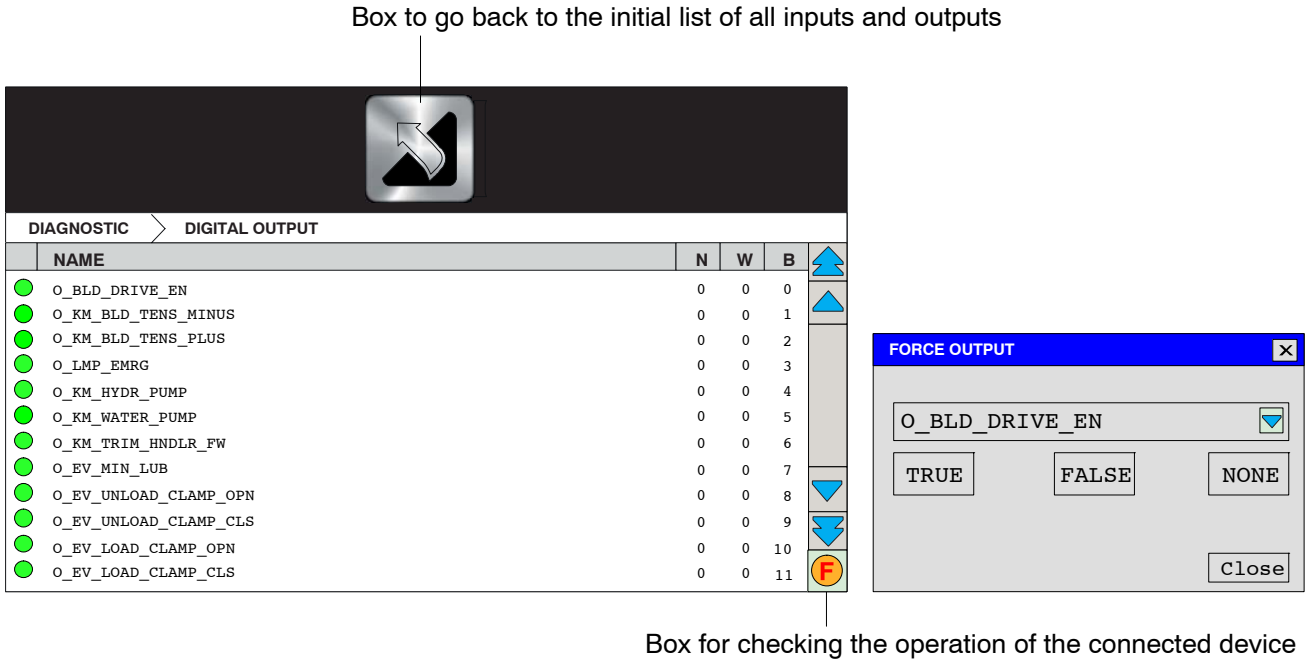
Digital INPUT list

M15–1	**INP 0**	I_LSPX_BLD_SPEED	**Blade speed proximity switch**
M15–2	**INP 1**	I_FOOT_START_PB	**Start from pedal board**
M15–3	**INP 2**	I_EME_PB	**Emergency stop button OK**
M15–4	**INP 3**	I_LS_BLD_COVER_CLSD	**Blade guard closed limit switch**
M15–5	**INP 4**	I_BLD_DRV_FAULT	**Alarm inverter**
M15–6	**INP 5**	I_BARR_OK	**Perimeter guard limit switch**
M15–7	**INP 6**	I_LS_MIN_LUB_MIN_OIL	**Low oil level**
M15–8	**INP 7**	I_BLADE_MAN_START	**Manual start from handle**
M18–1	**INP 8**	I_RESET_KEY_PRESSED	**Reset button**
M18–2	**INP 9**	I_FAST_JOG_KEY_PRESSED	**Enable button**

M18–3	**INP 10**	I_LS_BAR_PRESENT	**Bar presence limit switch**
M18–4	**INP 11**	I_LS_HOME_X	**Zero–setting limit switch**
M18–5	**INP 12**	I_XB_JStckMinus	**Joystick x–**
M18–6	**INP 13**	I_Y_JStckMinus	**Joystick Y–**
M18–7	**INP 14**	I_Y_JStckPlus	**Joystick y+**
M18–8	**INP 15**	I_XB_JStckPlus	**Joystick y+**
		I_A_KEY_PRESSED	**KEY CHECK A**
		I_B_KEY_PRESSED	**KEY CHECK B**
		I_C_KEY_PRESSED	**KEY CHECK C**
		I_D_KEY_PRESSED	**KEY CHECK D**
		I_F1_KEY_PRESSED	**KEY CHECK F1**
		I_F2_KEY_PRESSED	**KEY CHECK F2**
		I_F3_KEY_PRESSED	**KEY CHECK F3**
		I_F4_KEY_PRESSED	**KEY CHECK F4**
		I_F5_KEY_PRESSED	**KEY CHECK F5**
		I_F6_KEY_PRESSED	**KEY CHECK F6**
		I_F7_KEY_PRESSED	**KEY CHECK F7**
		I_F8_KEY_PRESSED	**KEY CHECK F8**

Digital Output

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



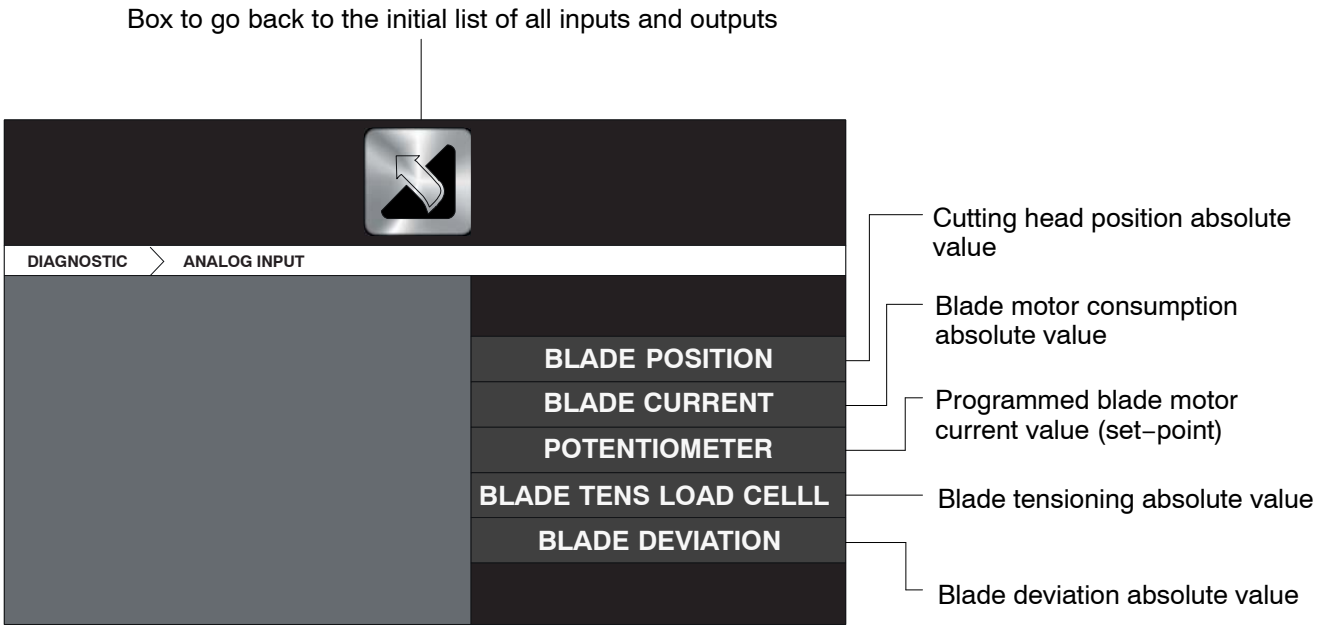
Digital OUTPUT list

M2–8	OUT 0	O_BLD_DRIVE_EN	**START INVERTER**
M2–6	OUT 1	O_LMP_EMRG	**FLASHING**
M2–4	OUT 2	O_OUT3	**SPARE**
M2–2	OUT 3	O_EV_Y_DOWNGOING_UNLOCK	**HEAD LOCK/RELEASE SOLENOID VALVE**
M3–5	OUT 4	O_KM_HYDR_PUMP	**UNIT START KM**
M3–4	OUT 5	O_KM_WATER_PUMP	**WATER PUMP START KM**

M3−3	OUT 6	O_KM_TRIM_HNDLR_FW	**CHIP DISCHARGER UNIT KM**
M3−2	OUT 7	O_EV_MIN_LUB	**LOW LUBRICATION SOLENOID VALVE**
M4−5	OUT 8	O_EV_UNLOAD_CLAMPS_OPN	**CHIP EJECTOR EV**
M4−4	OUT 9	O_EV_UNLOAD_CLAMPS_CLS	**CUTTING VICE OPENING EV**
M4−3	OUT 10	O_EV_LOAD_CLAMPS_OPN	**CUTTING VICE CLOSING EV**
M4−2	OUT 11	O_EV_LOAD_CLAMPS_CLS	**CUTTING VICE OPENING EV**
M5−5	OUT 12	O_EV_BLD_UP	**HEAD LIFTING SOLENOID VALVE**
M5−4	OUT 13	O_EV_BLD_DW	**HEAD LOWERING SOLENOID VALVE**
M5−3	OUT 14	O_HL_LASER_TRIM	**LASER PROJECTOR**
M5−2	OUT 15	O_HL_CUTTING_AREA	**CUTTING ZONE LIGHT**
M28−5	OUT 16	O_HYDR_PLATES	**Not available**
M28−4	OUT 17	O_MAT_HAND_FW	**Not available**
M28−3	OUT 18	O_MAT_HAND_MAN_BW	**Not available**
M28−2	OUT 19	O_MAT_HAND_CLEANCUT_BW	**Not available**
		O_BUZZER_ON	**Not available**
		O_LIKA_ENABLED	**Not available**
		O_Y_ENABLE	**Not available**

Analog Input

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

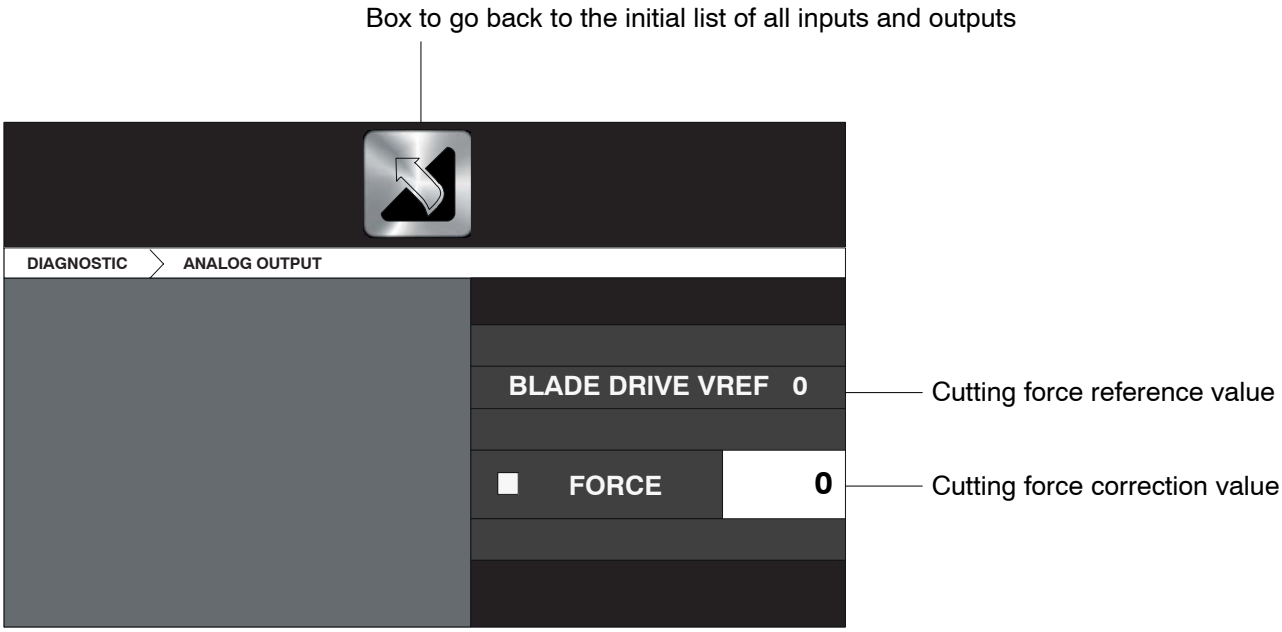


Analog INPUT list

M11	INP 0	**HEAD POSITIONING POTENTIOMETER**
M24	INP 1	**BLADE MOTOR CONSUMPTION**
M24	INP 5	**SPARE**
M25	INP 2	**H PANEL POTENTIOMETER**
M25	INP 6	**SPARE**
M26	INP 3	**SPARE**
M27	INP 4	**BLADE TENSIONING LOAD CELL**

Analog Output

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

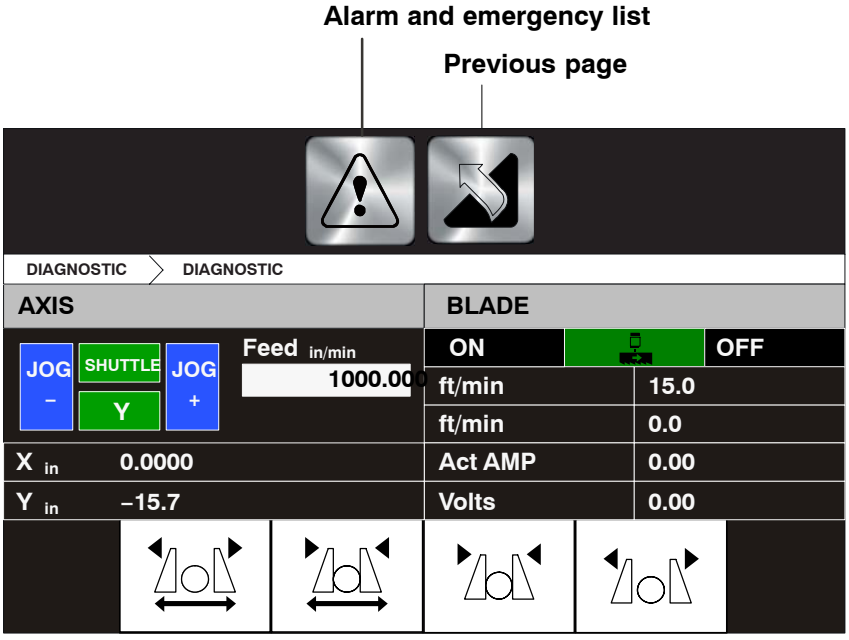


Analogue output list

M10	OUT 1	**BLADE SPEED REFERENCE**
M10	OUT 2	**SPARE**

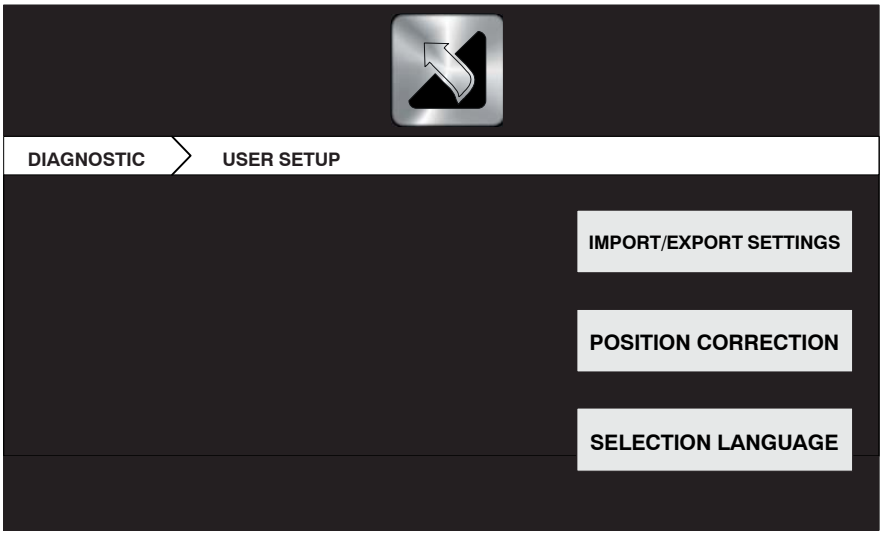
Troubleshooting

In this video page you can check the operation of the X and Y axes and of the belt rotation:



User setup

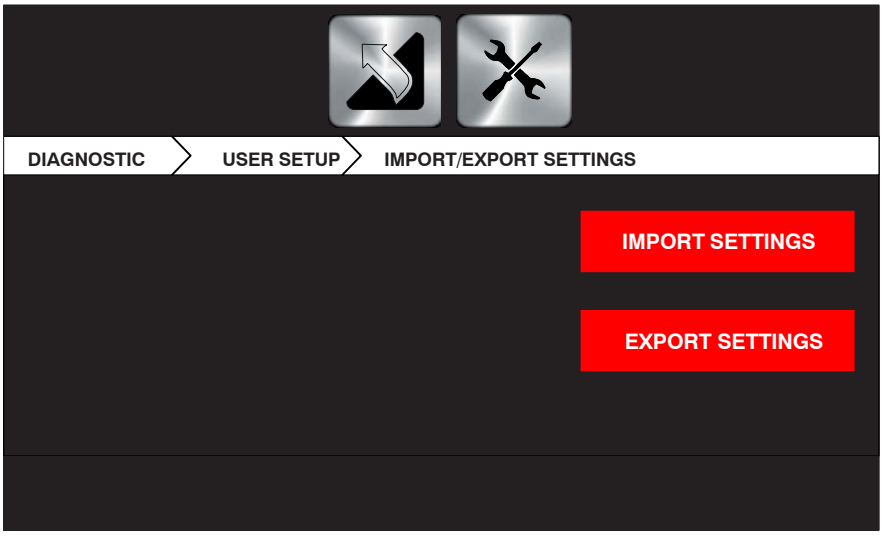
In this video page you can access the machine data importing or exporting utility, the feeder stroke node correction scheme and the selection of the control interface language.



Import / Export settings

You can manage the customised parameters of the machine using an USB key memory:

- Machine parameters
- Machine optional features
- Feeder stroke node correction
- Head lowering curve (HIDMAP)



“Importing” means transferring the contents of the USB key to the controller’s memory.

Attention Each time the ”IMPORT SETTING” operation is performed, the machine must be restarted after the download procedure has been completed.

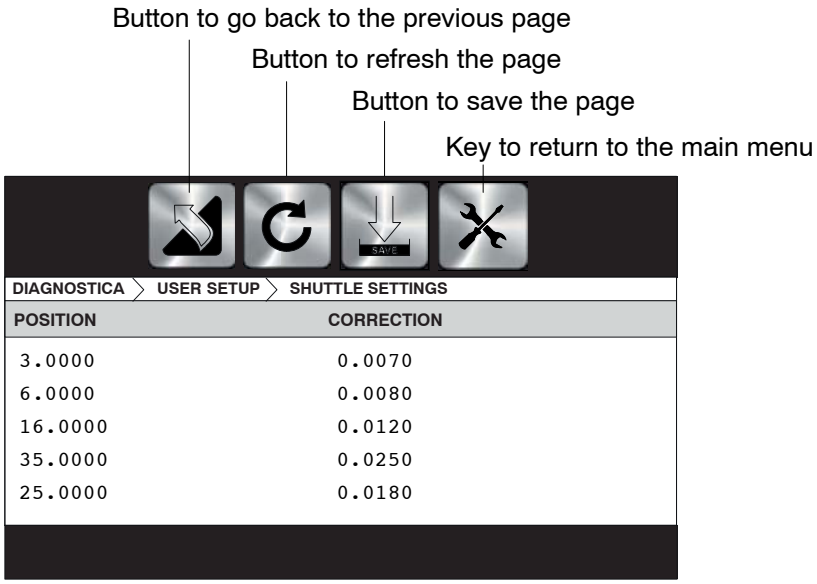
- ▶ Insert the USB Key into the slot in the control panel: the control automatically verifies that the contents of the USB memory are complete with the update/restore files.
- ▶ The download takes about 30 seconds, after which the ”IMPORT SETTINGS” and ”EXPORT SETTINGS” buttons are activated and turn green.
- ▶ Choose ”IMPORT” if you want to do another download, ”EXPORT” if you want to upload the control customizations to the USB key.

“Exporting” means transferring the controller’s memory to the USB memory.

- ▶ Insert the USB Key into the slot in the control panel: the control automatically verifies that the USB memory is empty.
- ▶ Automatically the control writes two text files into the USB key, to define the date and the history of the sawing machine events.
- ▶ Wait about 30 seconds, then activate the ”EXPORT SETTINGS” button which turns green.
- ▶ Press ”EXPORT” to upload the control customizations to the USB key.

Position correction

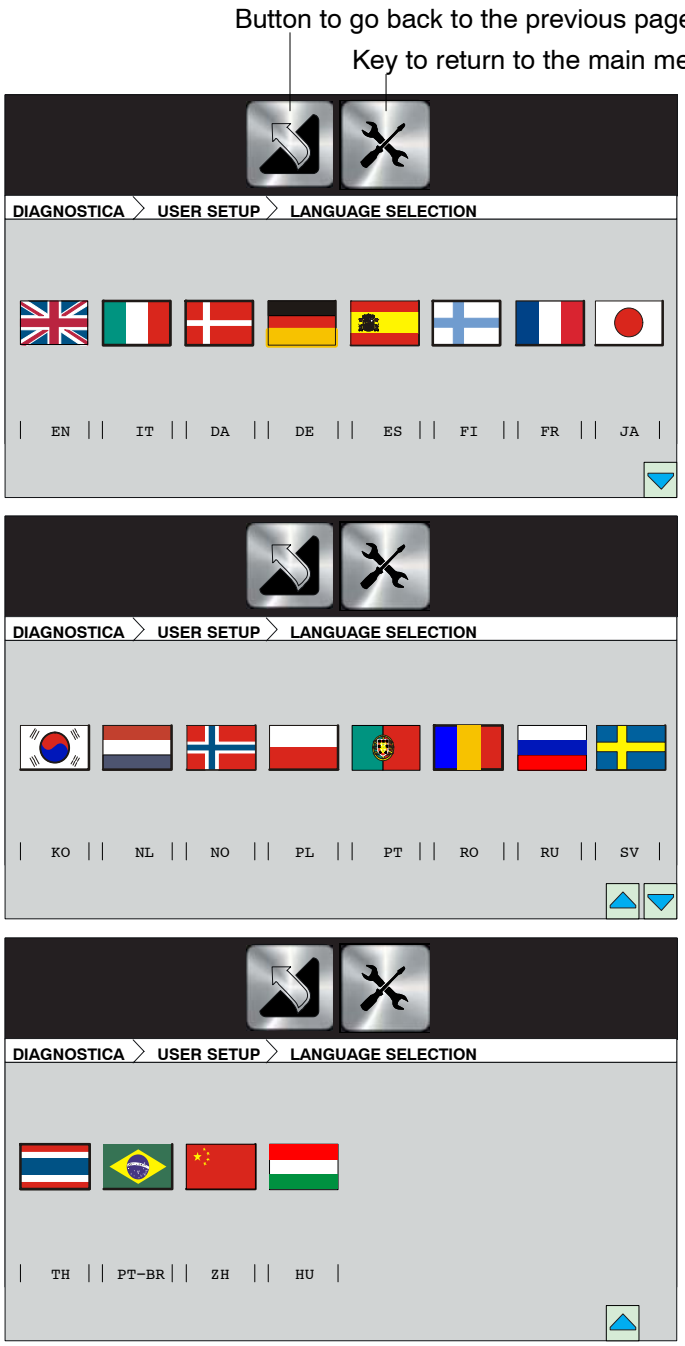
In this video page you can correct the complete stroke of the feeder shuttle entering the correction factors at preset values.



Language selection

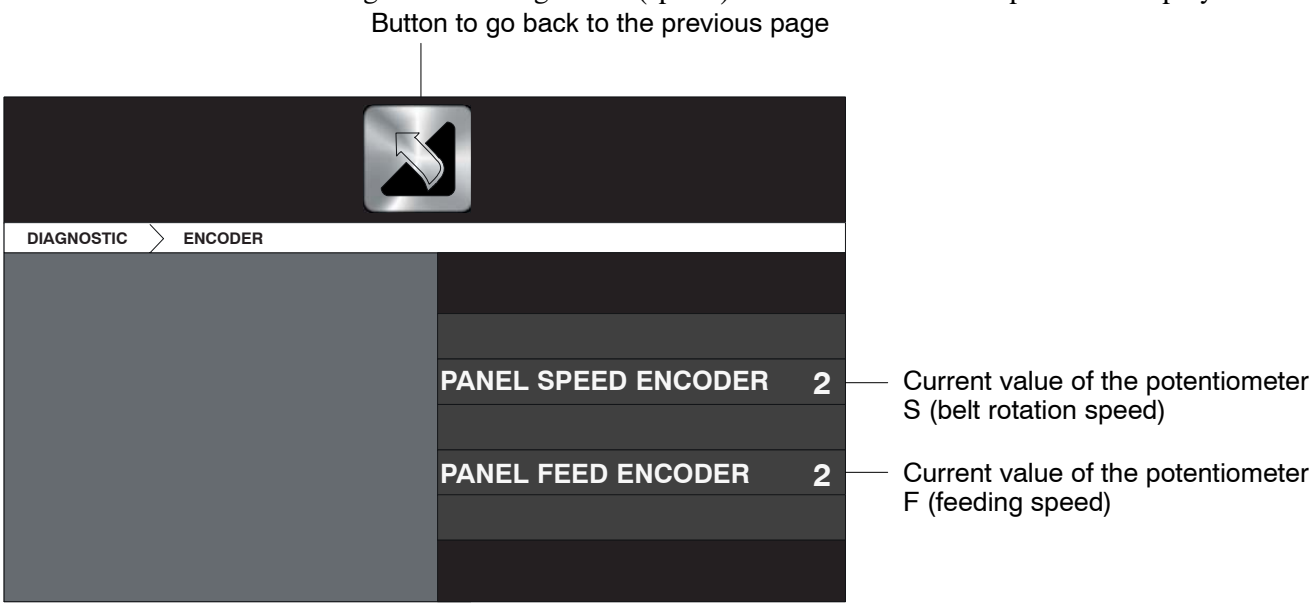
In this video page, and in the following ones that can be viewed by pressing the box with the arrow in the right bottom, you can choose the controller interface

language by pressing the corresponding flag. Immediately after selecting the language, the control proceeds autonomously to the reboot of the system.



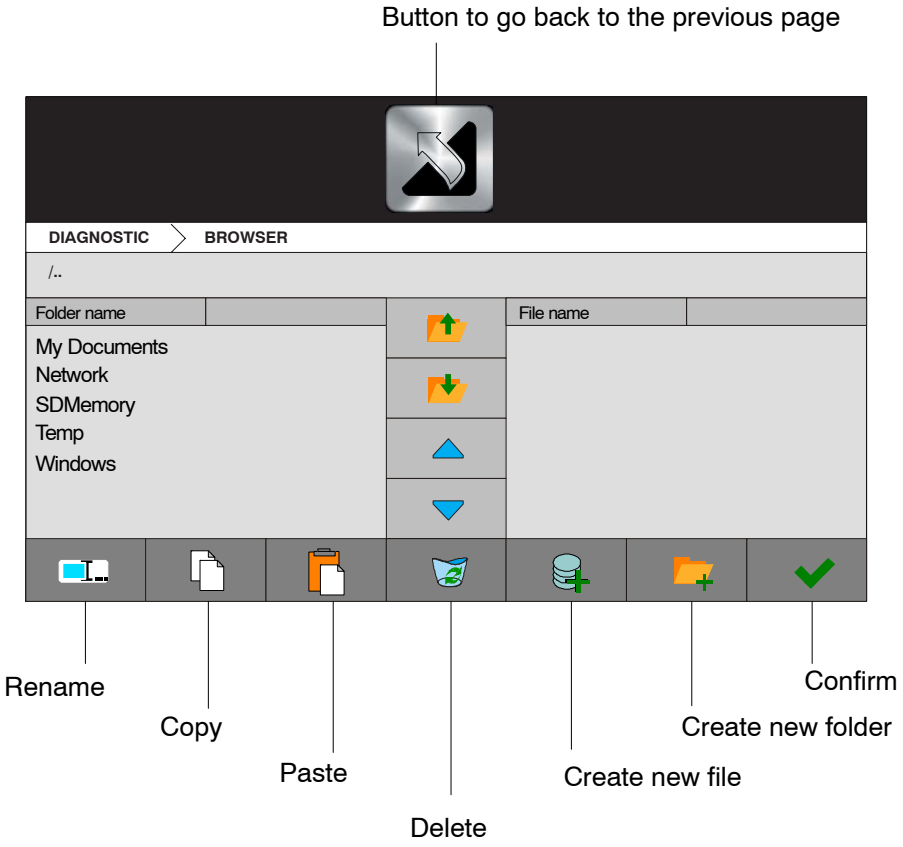
Encoder

In this video page the current values of the potentiometers F (feed) for the cutting head feeding and S (speed) for the belt rotation speed are displayed.



Browser

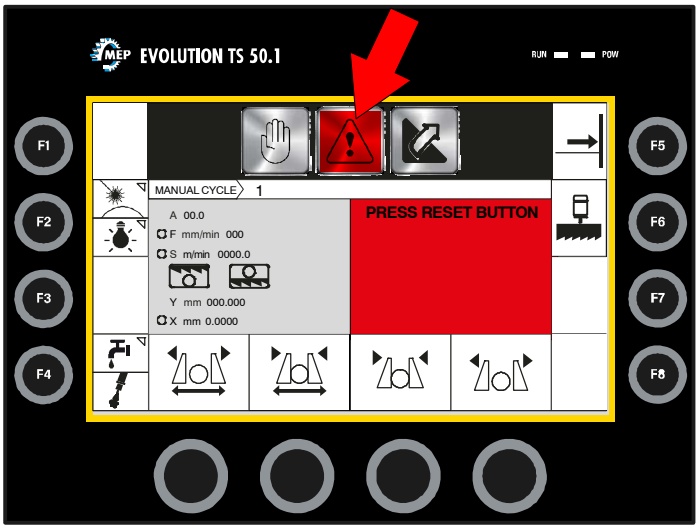
This function enables to display the resources of the control and of the peripherals connected through USB or network.



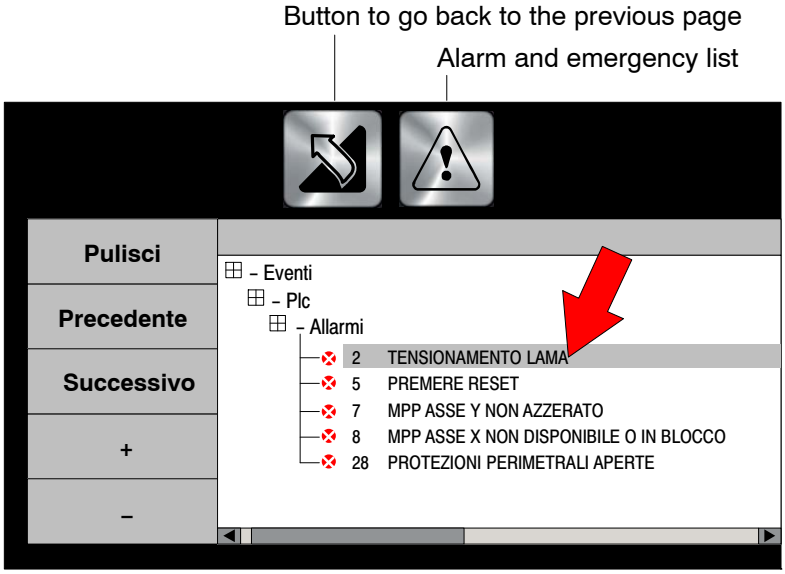
Machine alarms and warning messages

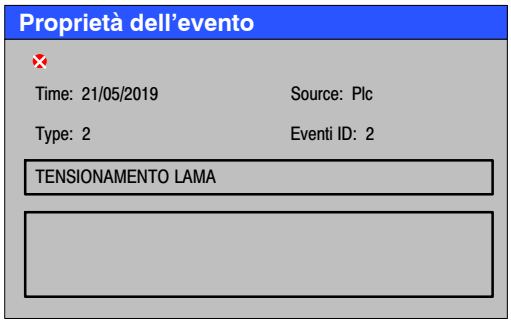
Alarms

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.



The messages are catalogued with an ID number. Selecting the text of the message, or scrolling with the keys on the left of the video page, you can display its date, frequency, origin and cause of displaying.





`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

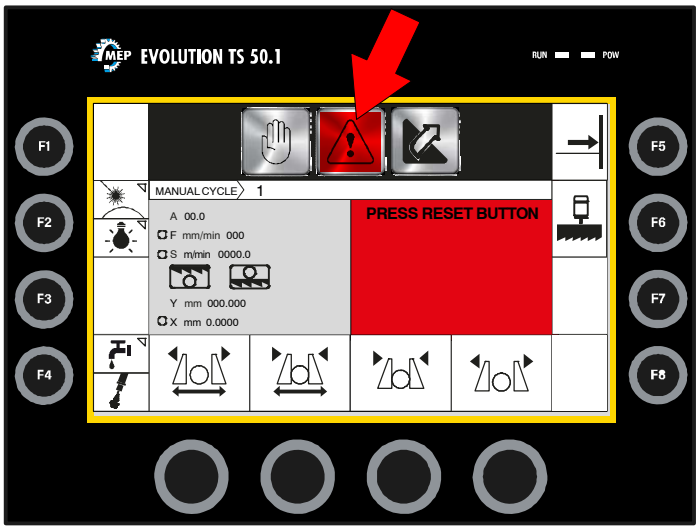
INSUFFICIENT BLADE REVOLUTION SPEED	This appears when the blade jams in the cut or breaks ▶ Check blade integrity ▶ Check cutting parameters
PRESS RESET	This appears in case of controller malfunction
EMERG. BUTTON PRESSED	It is displayed when the emergency mushroom button is pressed
Y AXIS ST. M. NOT 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
LOADING MATERIAL WITH BLADE IN SAFETY ZONE	It is displayed when the set cutting dimension may cause an impact of the material with the cutting blade while feeding
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.
CLOSE BOTH VISES AND ADJUST THE END OF STOCK MICRO	It is displayed when the bar passage limit switch on the feeder is not operated anymore. ▶ Check the electric limit switch and the digital input of the controller

LOCKED SHUTTLE	It is displayed when the machine control is prevented from moving the X axis. ▶ Open the feeding and cutting vices
MICRO ERROR DURING HOMING PROCEDURE	It is displayed when the feeder carriage does not activate the zero−setting limit switch anymore. ▶ Check the electric limit switch and the digital input of the controller

Warning messages

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

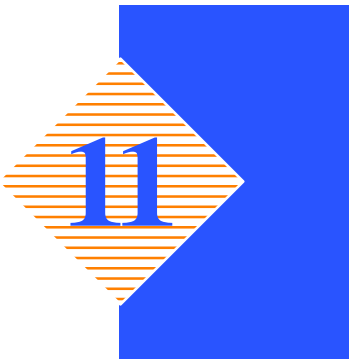


ENABLE BLADE MOTOR	It is displayed when trying to start the cycle without having enabled the blade motor before
START FROM HANDLE	It is displayed when the cutting cycle is started with the grip during a semi−automatic cycle.
STOCK WARNING	Available
SPRAY MIST OIL LEVEL	This appears when there is no oil for minimum lubrication
RHLS FHLS NOT COHERENT	This appears when the RHLS and RHLS are not coherent
STOCK WARNING	Available
CLEAR PIECES	It is displayed when: the number of cut pieces must be zeroed;
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
ERROR DURING QUEUE UPDATING	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
X AXIS ST. M. DRIVER LOCKED	It is displayed when the feeder cannot move forwards or backwards due to a mechanical or electro–mechanical obstacle.

QUEUE UPDATING ATTEMPT FROM REMOTE DURING CYCLE	It is displayed when you try to access the resources during a working cycle
FILES IN USE BY MES, WAIT FOR RELEASE	It is displayed when you try to access the resources during a working cycle
IOMASK INSERTED OR DELETED. PLEASE REBOOT THE MACHINE	It is displayed when a hardware error occurs. Restart the machine.
ERROR DURING COPING OR DELETING OF IOMASK FILE	It is displayed when a hardware error occurs. Restart the machine.
ENABLE BLADE MOTOR	It is displayed when you try to start the working cycle before having enabled the blade motor.
LENGTH > 0	It is displayed when the set cutting length is zero.

Optional



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

Optional

Blade

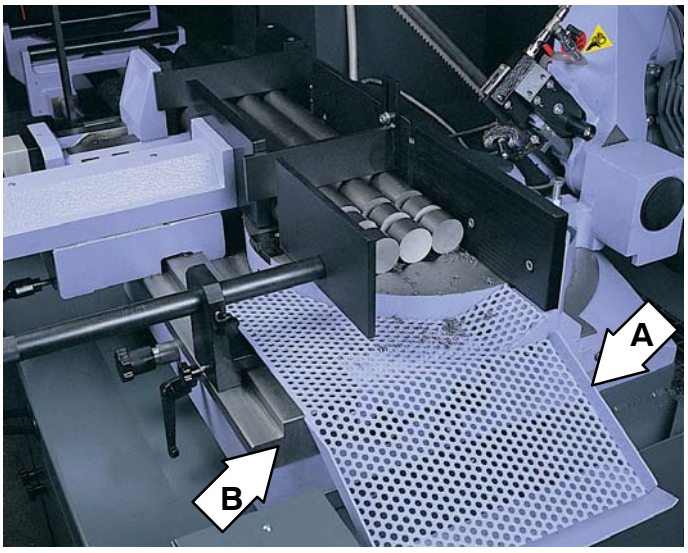
The blades that can be used on this machine include:

- 3650x27x0.9 bimetal blade for solid and section materials;

Device for beam cutting and piece discharge guide

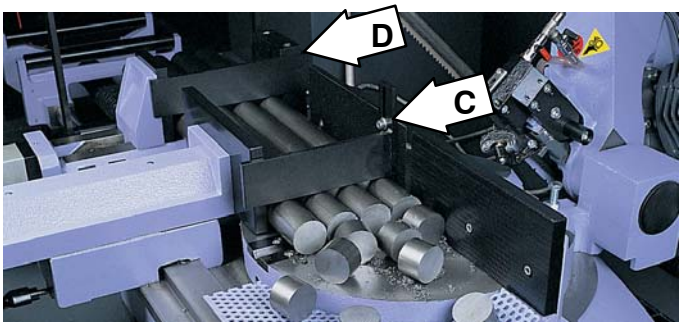
This group of accessories facilitates beam cutting. The following operations are required for fitting these optional items:

- remove the piece discharge slide (A);



- fit the piece discharge guide into the dovetail guide (B) on the machine's fixed platform and tighten the locknut;
- replace the piece discharge slide;

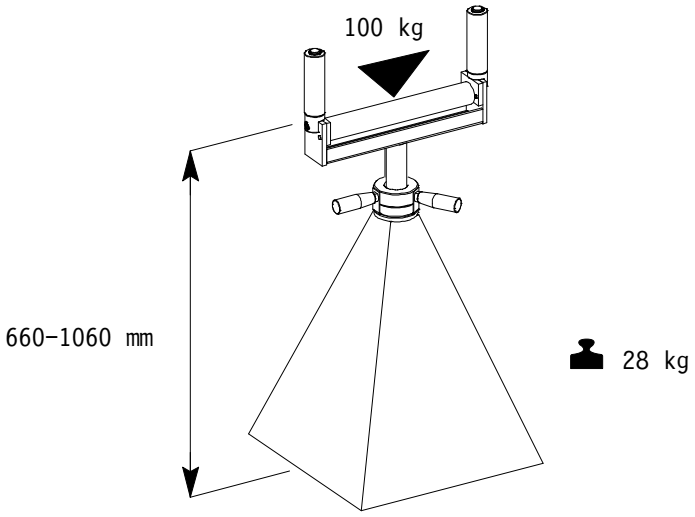
- remove the jaw from the left square on the cutting vice (C);



- refit the jaw on the feeder vice square (D);
- insert the brackets in their respective positions, positioning jaws on the cutting and feeder vice squares.
- Set the height and length of the beams.

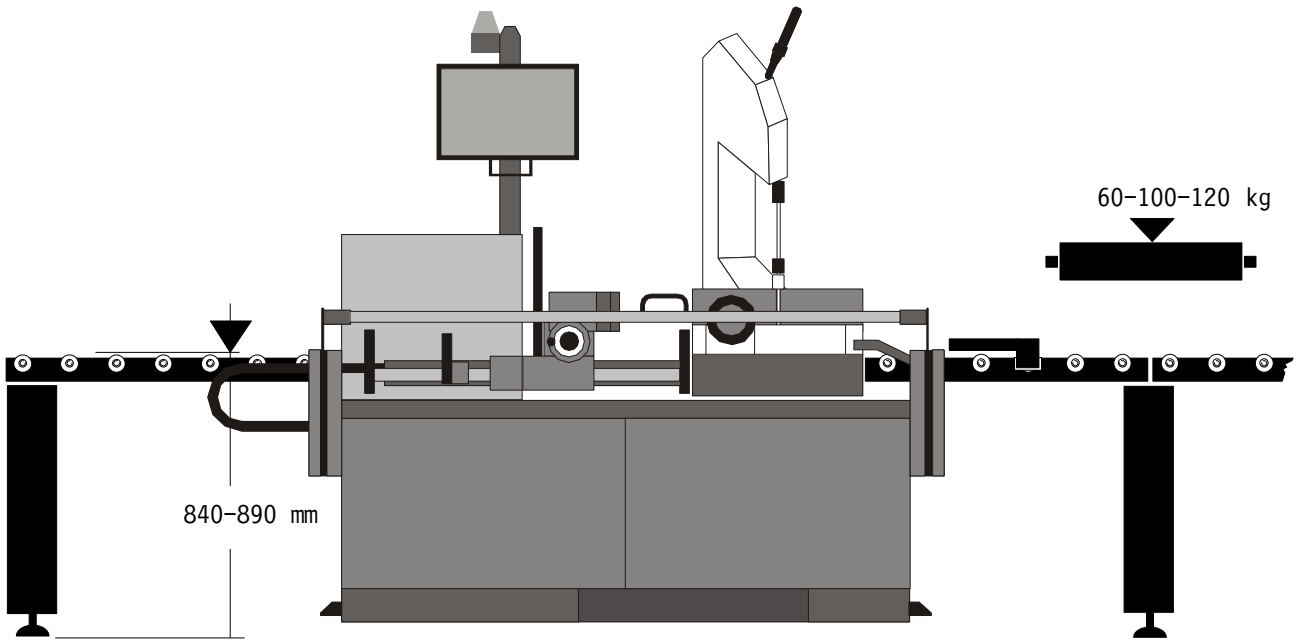
Bar support

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.



Roller table

- K110 roller table module for feed side, 1500 mm;



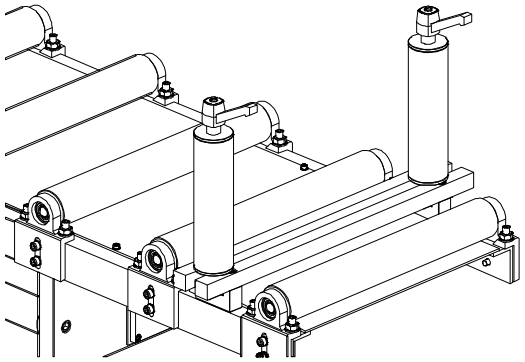
- K110/R1/R2/R3 roller table for discharge side, 1500÷6000 mm;

Pair of vertical rollers

This device can be fitted to the loading and unloading rollerways, to provide adequate support for large sized bars when these are being machined. The following are the instructions for assembly:

▶ select the point at which the device is to be positioned, at the beginning or the end of the rollerway, according to the material being machined;

▶ then fix the vertical rollers guide support to the rollerway using screws;



▶ adjust the distance between the vertical rollers, using the snap levers, to suit the cross−section of the workpiece.

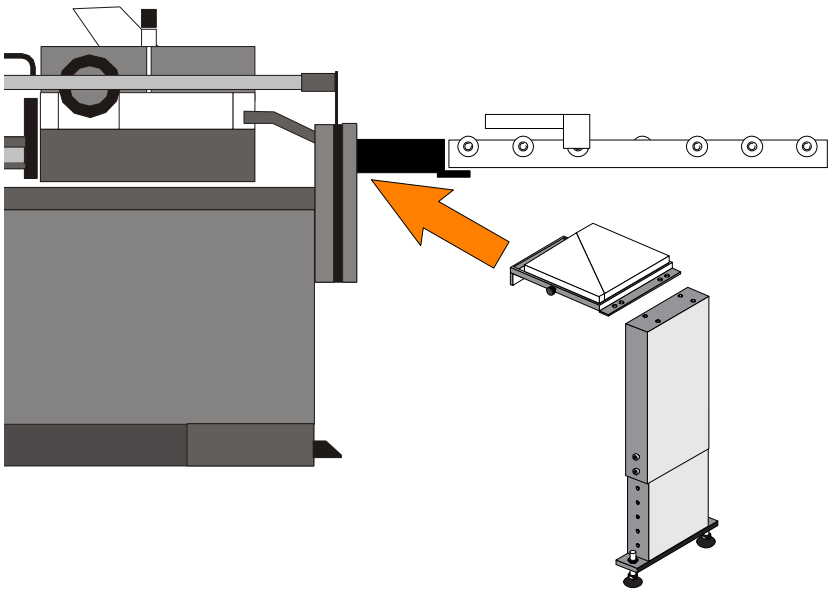
Can of emulsible oil

5 l can of emulsible oil.

Discharge side roller table adaptor

Two adaptors are available for this model of machine that differ in terms of the load capacity. The installation operations are given below:

- remove the two TE screws from the right side of the slideway;
- install adaptor, fixing the plate to the fixed platform after having removed the bolts, and fit the support to the end of the plate, using two of the four holes in the upper part of the support, leaving the other two free for attaching the roller−way.

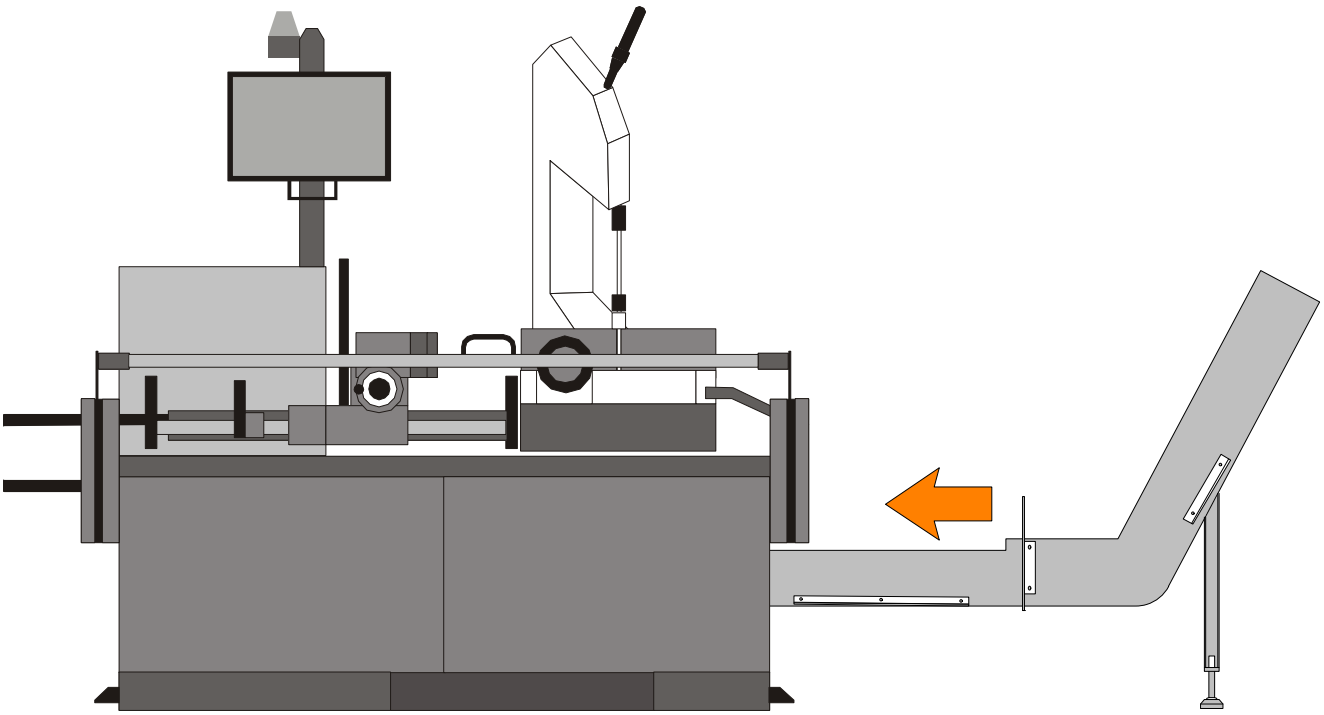


- Attach the outfeed rolling deck by fixing it with the screws supplied.

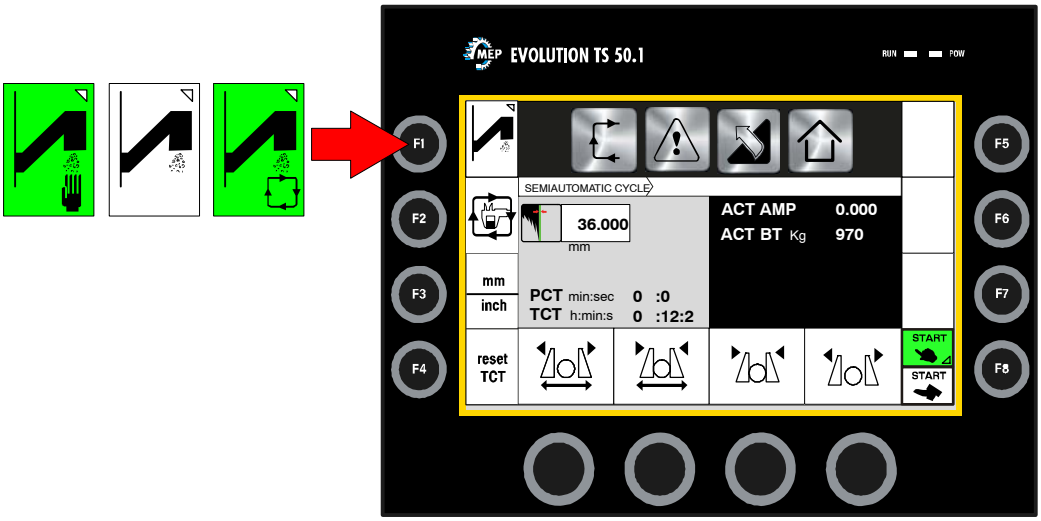
Motor chip discharger unit

This device can be used to eliminate the chips from the chip collection drawer; for installation, proceed as follows:

- ▶ disconnect the machine from the power supply;
- ▶ extract and remove the chip collection drawer;



- ▶ fit the lower part of the discharger unit in the place of the drawer, making the holes coincide for the screws;
- ▶ adjust the discharger unit feet so that the conveyor belt is slightly tilted;
- ▶ connect the machine to the power supply again;
- ▶ start the machine and select the operating mode on the control panel; from left to right in order: manual, inactive, automatic.



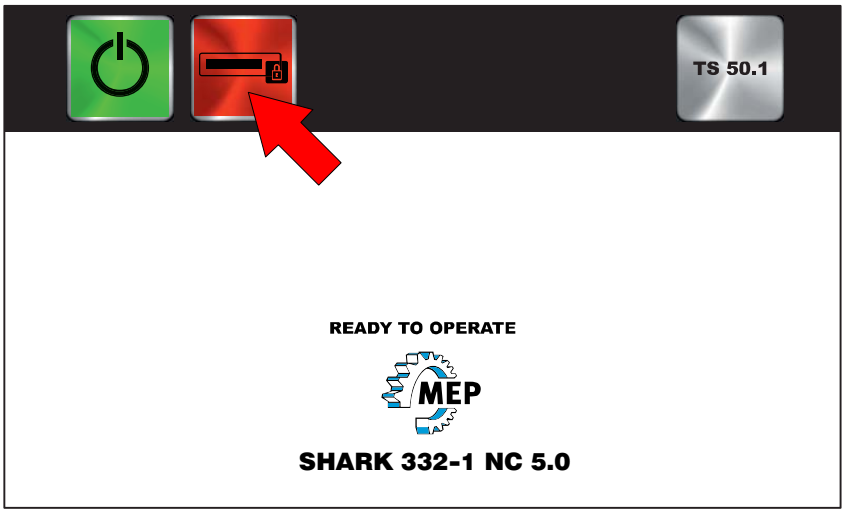
Minimal lubrication system

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

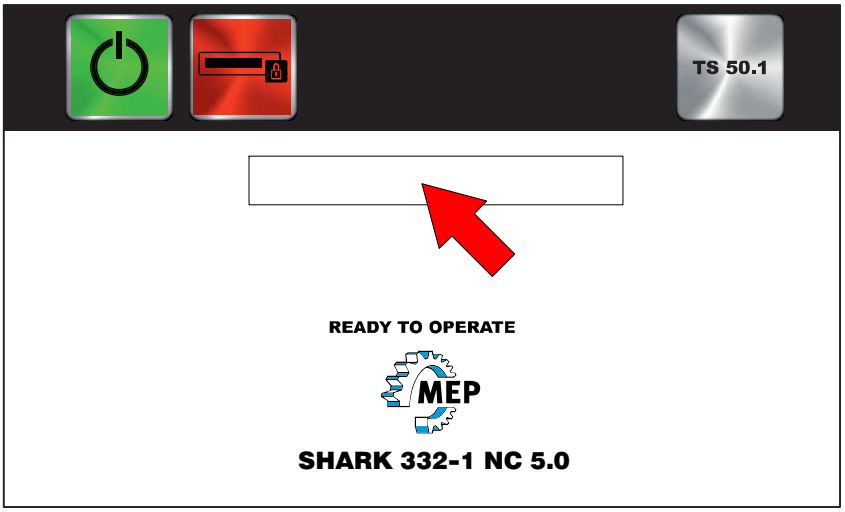
▶ An instruction book is supplied with the kit to explain how to install this optional unit.

Software setting for the options

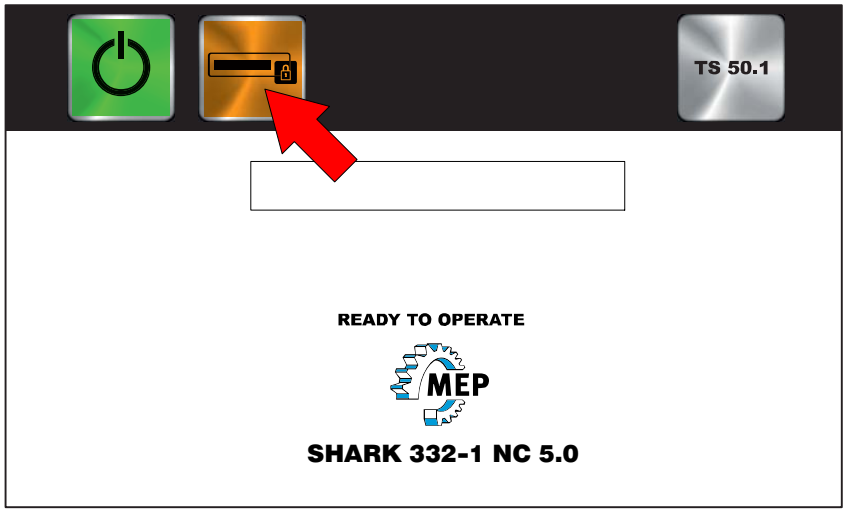
To access the options page of the software program, press the box shown in the figure:



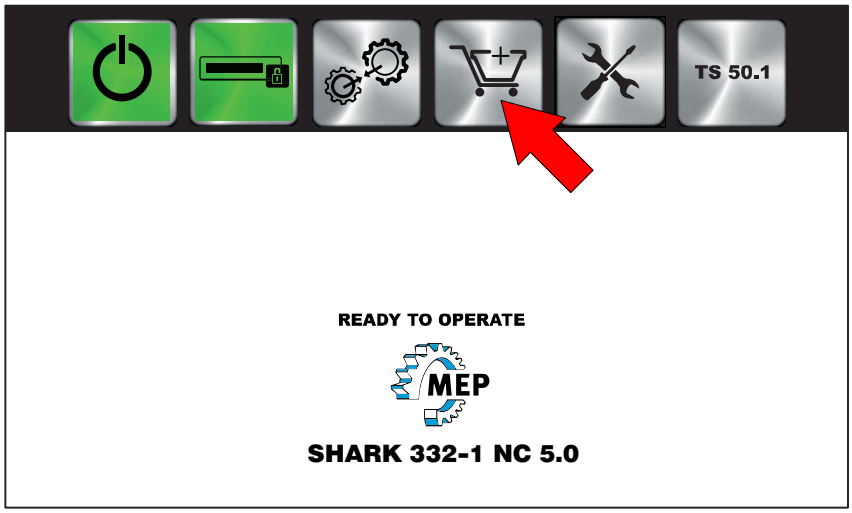
▶ The password entry box will open. Tap the box to open the keypad. Enter 734533.



▶ Tap on the box shown in the figure.



▶ Tap on the box shown in the figure.

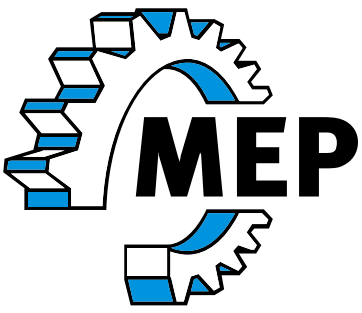


The machine displays the list of options that can be installed and the parameters to be set:

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

OPTIONAL:		
OPT.7	**BLADE SPEED PROXY ENABLEMENT (1=ENABLED)** **Enables or disables the blade current speed control.**	1.0000
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.**	1.0000
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.**	1.0000
OPT.17	**FEEDER VICE CLOSING TIME (SEC)** **Sets the closing time of the feeder vices.**	2.0000
OPT.18	**FEEDER VICE OPENING TIME (SEC)** **Sets the opening time of the feeder vices.**	2.0000
OPT.19	**CUTTING VICE CLOSING TIME (SEC)** **Sets the closing time of the cutting vices.**	2.0000
OPT.20	**CUTTING VICE OPENING TIME (SEC)** **Sets the opening time of the cutting vices.**	2.0000
OPT.21	**VICE OPENING TIME WITH MANUAL PULSE CONTROL (SEC)** **Sets the opening time of the vices with manual control from control board.**	3.0000
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
OPT.26		0.0000

Mep spa guarantees that the sold product is free from defects making it unsuitable for its intended use or significantly decreasing its value.
The guarantee shall not apply if the buyer was aware of defects in the product when buying it or if defects were clearly recognizable.
Regulations by the Italian law shall apply to this article.


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