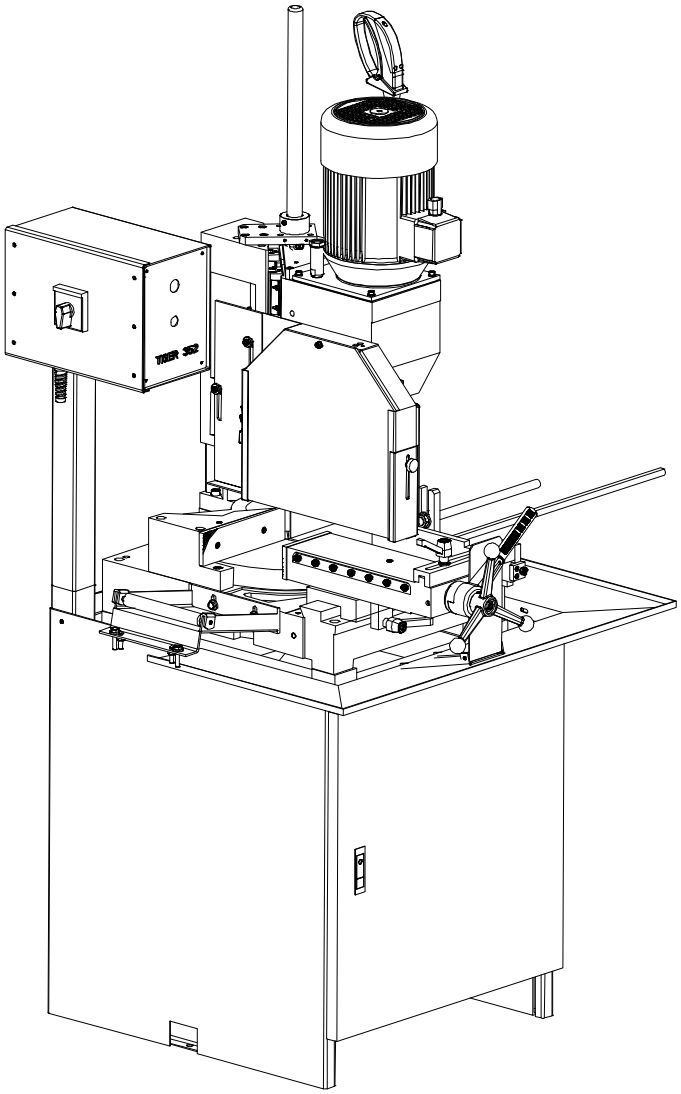


USE AND MAINTENANCE MANUAL

EN TIGER 352

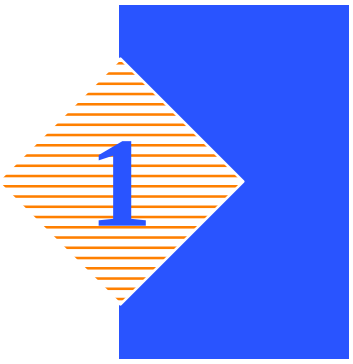
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Introduction and technical specifications



Foreword

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

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

TIGER 352 is a 4-speed vertical shearing machine and can perform mitre cuts of 60° on the left and 45° on the right.
These features, together with its good cutting capabilities, make the Tiger 350 a very versatile machine.

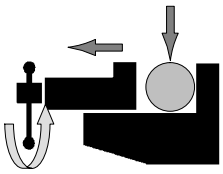
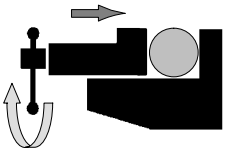
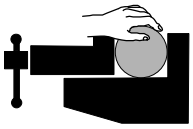
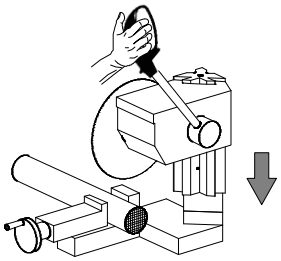
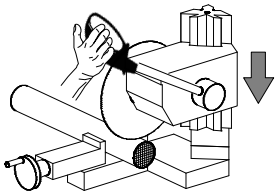
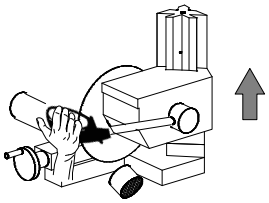
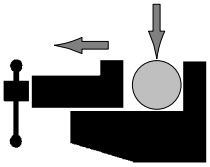
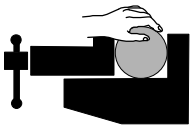
Congratulations for having chosen this product which, by following the instructions contained in this user and maintenance handbook, will guarantee you years of dependable service.

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

Machine presentation

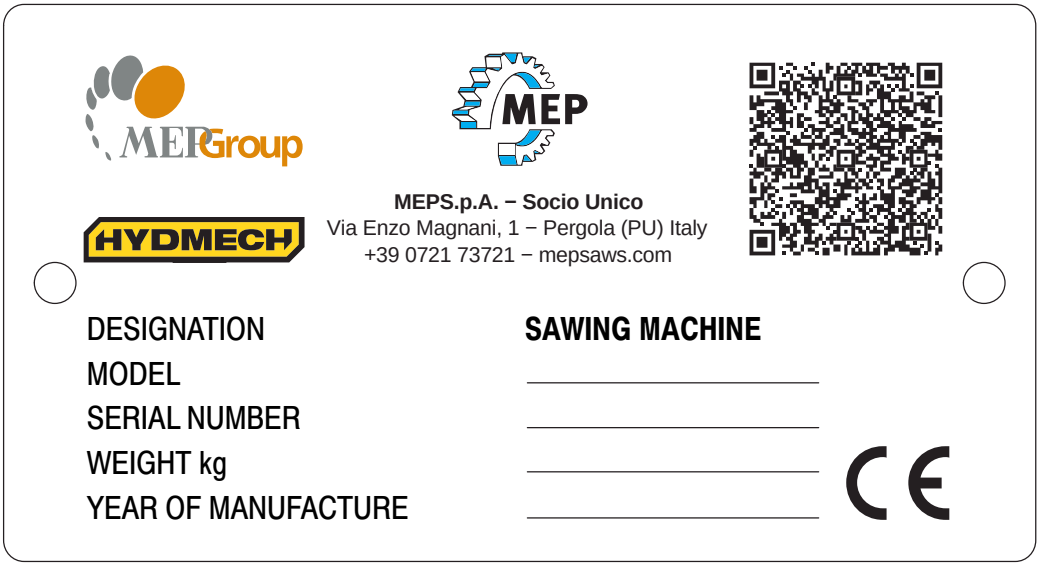
The machine is controlled manually: after having clamped the material in the vice, the operator grips the head control lever and presses the blade start−up microswitch. The downward movement of the lever controls the cutting of the material in accordance with the preset length. At the end of the cut, the cutting head moves upwards ready for another cutting cycle.

The MA version (automatic vice), a pneumatic cylinder clamps the workpiece between the jaws of the vice; the open/close command for the jaws is located on the base of the machine.

1. Position the material in the vice 	2. Close the vice 	3. Make sure the workpiece is securely clamped in the vice by trying to move it manually. 	4. Start the blade 
5. Cutting the material 	6. At the end of the cut, the head can be raised. 	7. Open the vice 	8. Feed the next part to be cut manually 

Machine specification

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



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

TIGER 350 CUTTING SPEEDS		
Speeds 1/2/3/4 (standard speed)	rpm	15/30/45/90
Speeds optional 1/2/3/4	rpm	30/60/90/180

BLADE		
External disc diameter	mm	350
Internal hole diameter	mm	32
Blade thickness	mm	2,5

RATED ELECTRICAL POWER		
Standard three phase head spindle motor	kW	2,6/1,8
Optional three phase head spindle motor (only for Tiger 350 4 speed version)	kW	3/2,2
Electric coolant pump motor	kW	0,1
Max installed power	kW	3,1

WORKING PRESSURE		
Air consumption for vice (version MA)	Nl/min	1,32

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

LUBRICANT/COOLANT FLUID AND OIL		
Lubricant/coolant fluid (oil concentration 5−6%)	capacità Lt.	20
Oil for transmission box	capacità Lt.	4,8

VICE		
Vice max. opening	mm	190

SPECIFICATIONS OF STANDARD SPINDLE MOTOR				
No.of poles	**Current (Volts)**	**Absorption (Amps)**	**Power (kW)**	**rpm**
4	230/400	14,5/8	2,6	1.440
8	230/400	10/5,7	1,8	715
Stator wound with enamelled copper wire, class H 200°C.				
Class F insulation (limit temperature TL 155°C).				
IP 55 protection rating (total against contact with live parts, water sprayed from all directions, with shaft oil seal).				
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, the allowable overtemperature is 100° C (where 100° C represents the allowable ΔT).

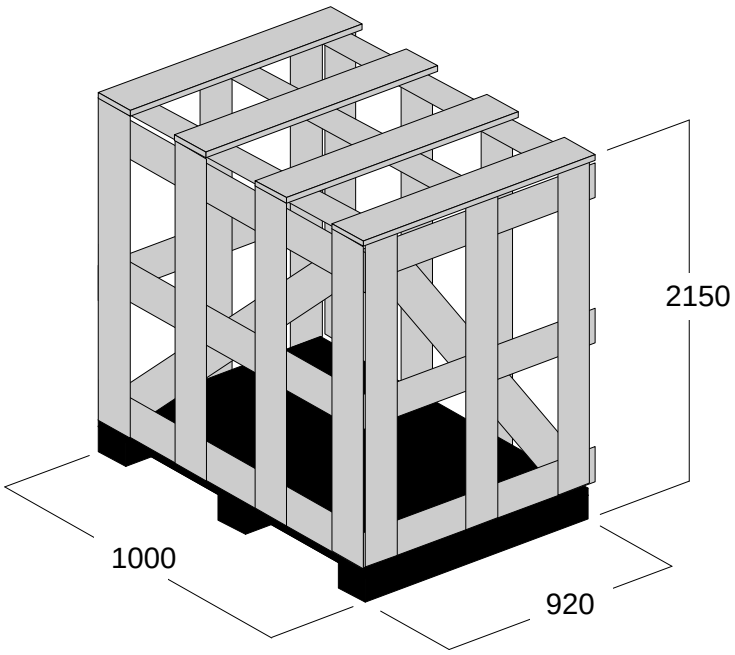
SPECIFICATIONS OF THE OPTIONAL SPINDLE MOTOR				
No.of poles	**Current (Volts)**	**Absorption (Amps)**	**Power (Kw)**	**rpm**
2	230/400	7,1	3	2832
4	230/400	5,3	2,2	1420
Stator wound with enamelled copper wire, class H 200°C.				
Class F insulation (limit temperature TL 155°C).				
IP 54 protection rating (total against contact with live parts, water sprayed from all directions, with shaft oil seal).				
Conforming to CEI−EN 60034−1:2011				

ELECTROPUMP MOTOR			
Voltage (Volts)	**Absorption (Amps)**	**Power (Kw)**	**rpm**
230	0,53	0,1	2800
400	0,34	0,1	2800
Protection rating IP 55.			
Conforming to CEI−EN 60034−1:2011			

CUTTING CAPACITY for HOLLOW sections			
Section	○	□	▭
0°	115	95	180 x 95
45° ◗	110	95	125 x 95
45° ◖	110	95	125 x 95
60° ◖	90	80	90 x 95

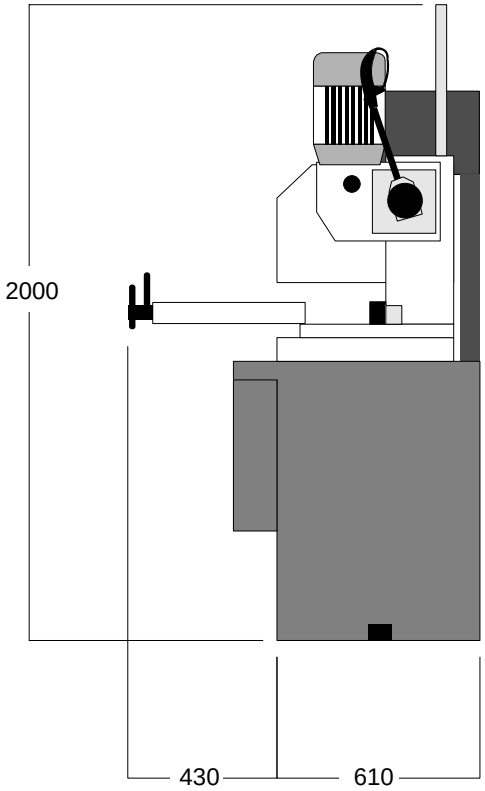
CUTTING CAPACITY for SOLID sections		
Section	■	▬
0°	90	
45° ◗		64 x 90
45° ◖		64 x 90
60° ◖		45 x 90

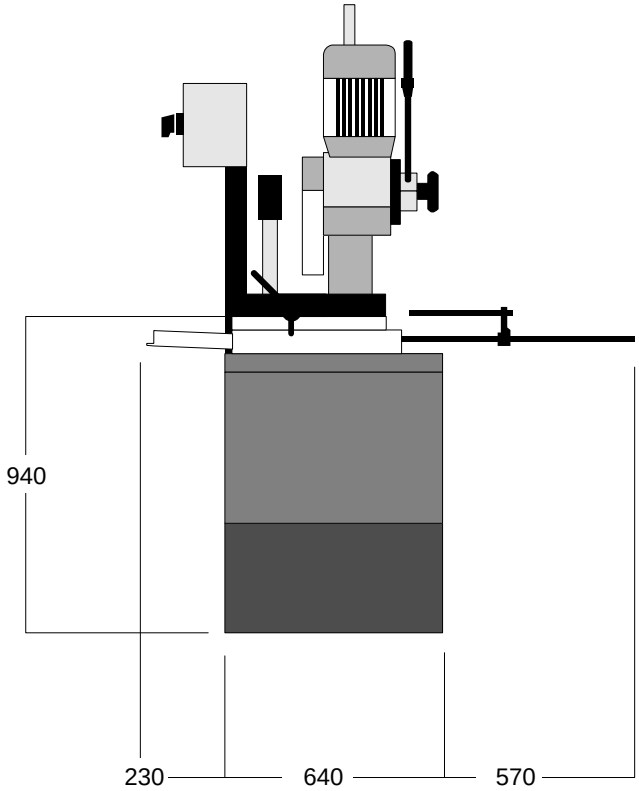
PACKED WEIGHT		
Wooden cage and pallet	Kg	70
Wooden pallet	Kg	20

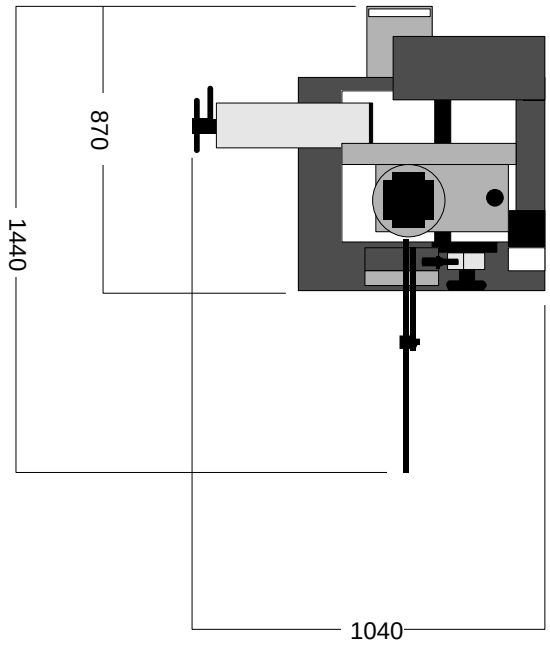


Dimensions

MACHINE INSTALLED		
Work table height	mm	940
Weight	Kg	375





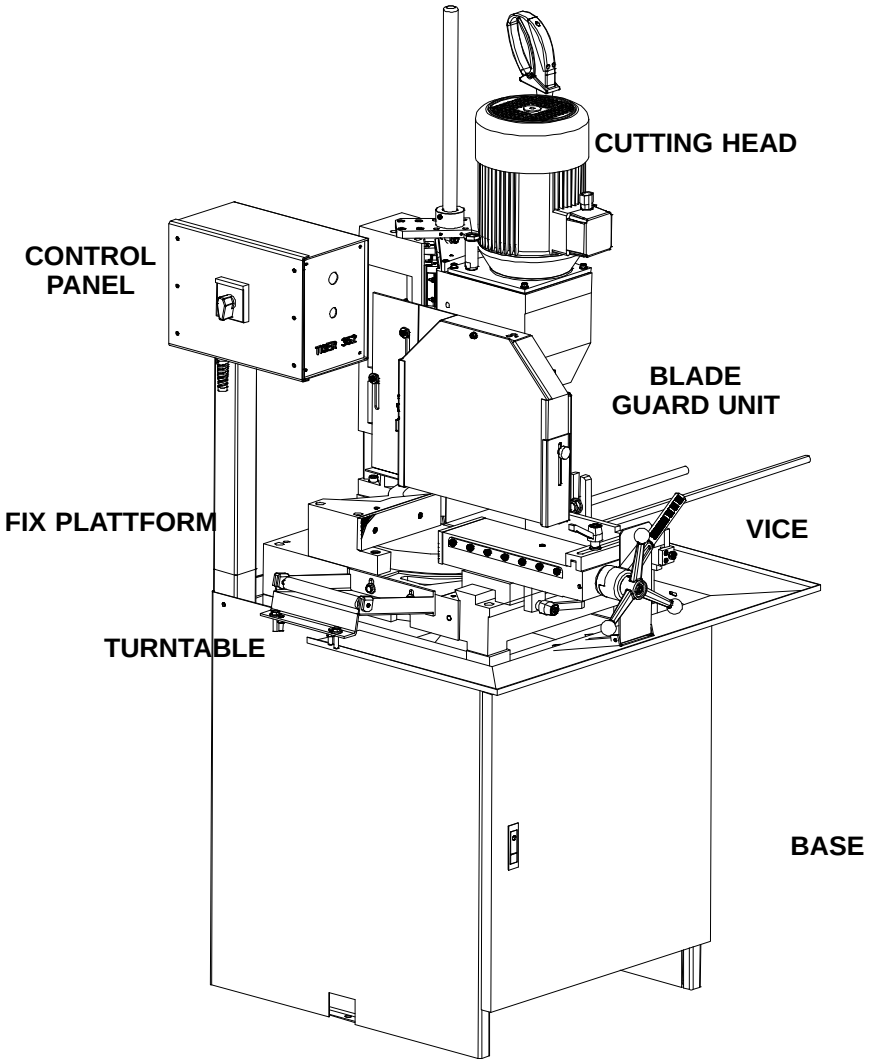


Functional parts

2

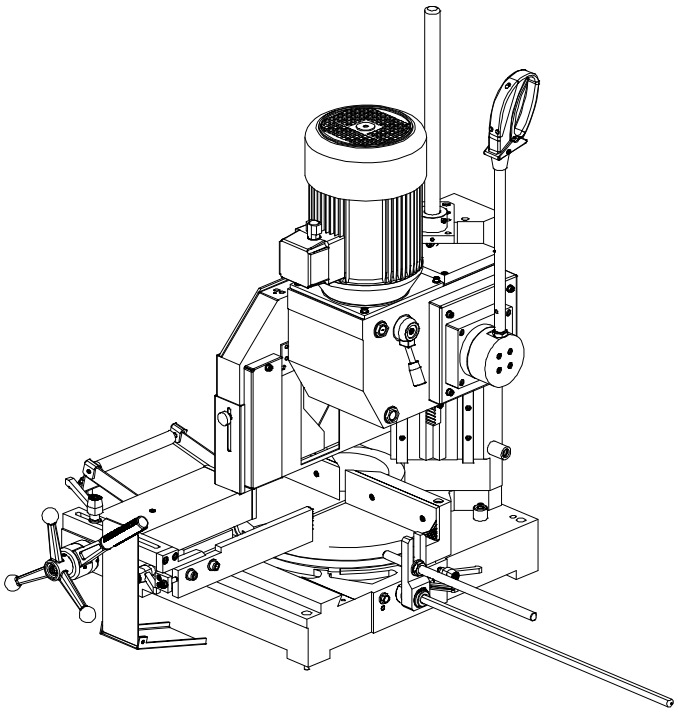
TIGER 352 model

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.



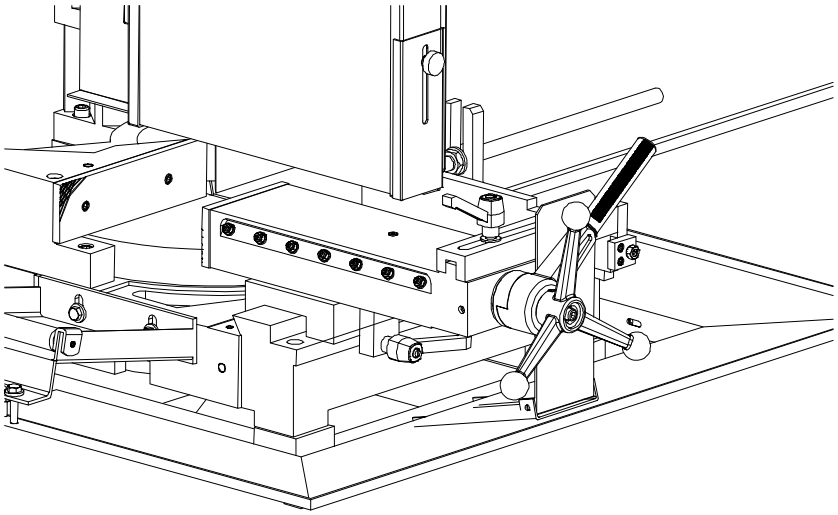
Cutting head

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 operating head slides on a double prismatic guide integral with the rotating platform and carries out a vertical stroke from the upper to the lower position; its weight is balanced by a gas spring.



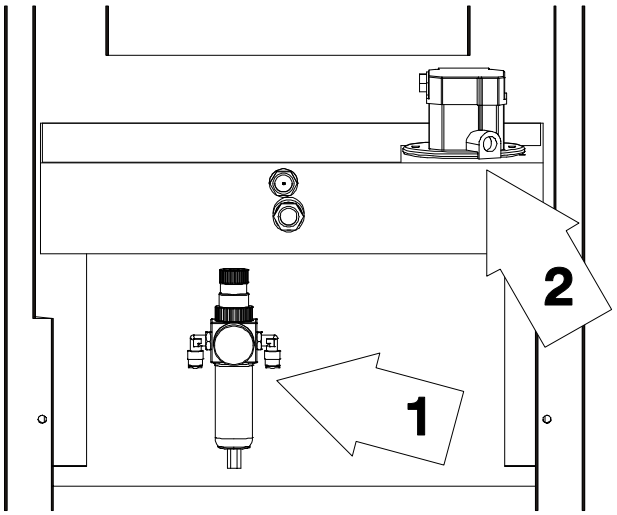
Vice

The vice is the unit that clamps the workpiece in place during cutting; it consists of a vice support, commonly known as a lead nut, fixed to the work table, and a lead screw with a slideway on which the mobile jaw is mounted. The vice is operated manually by a handwheel, or by a pneumatic cylinder in the MA version (optional).



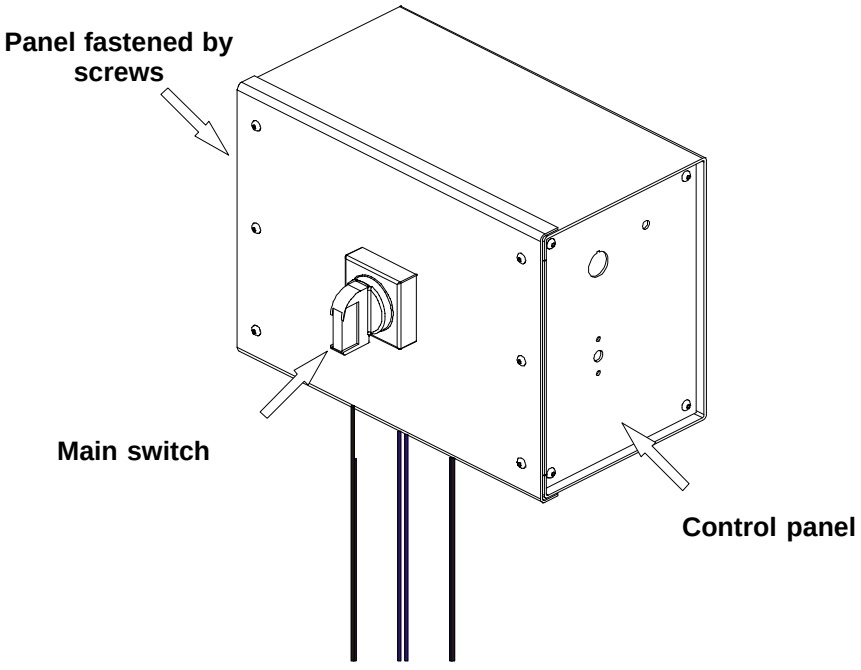
Air treatment unit for the automatic vice (version MA)

The panel shown in the diagram below is the air treatment unit. It consists of an air treatment unit (1) and a valve; the unit serves to filter the air entering the circuit. The box above the air treatment unit is for the coolant and its electric pump (2).



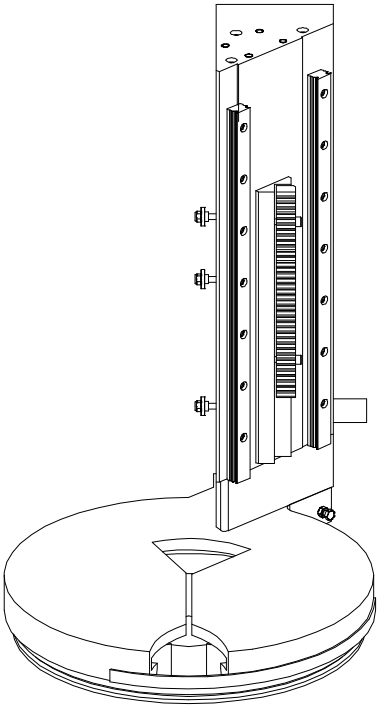
Control Panel

The control panel has a protection rating of IP 54 and contains the electrical equipment. Access is gained by removing a few screws, while the operator's safety is guaranteed by a key−operated safety switch, designed to prevent any intentional interference with the unit. In fact, removing the control panel from its mounting simultaneously extracts the key from the switch, thus cutting−off the electricity supply to the machine.

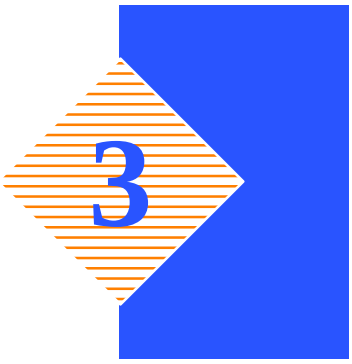


Turntable

A cast iron casting forms the fulcrum for the cutting head, and the support for the work table and the control panel. Releasing the locking lever on the slideway allows the cutting head to be rotated to the right and to the left.



Safety and accident prevention



The **TIGER 352** has been designed and produced in accordance with European standards. For the correct use of the machine we recommend that the instructions contained in this chapter are carefully followed.

Use of the machine

The disk vertical sawing machine **TIGER 352** 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

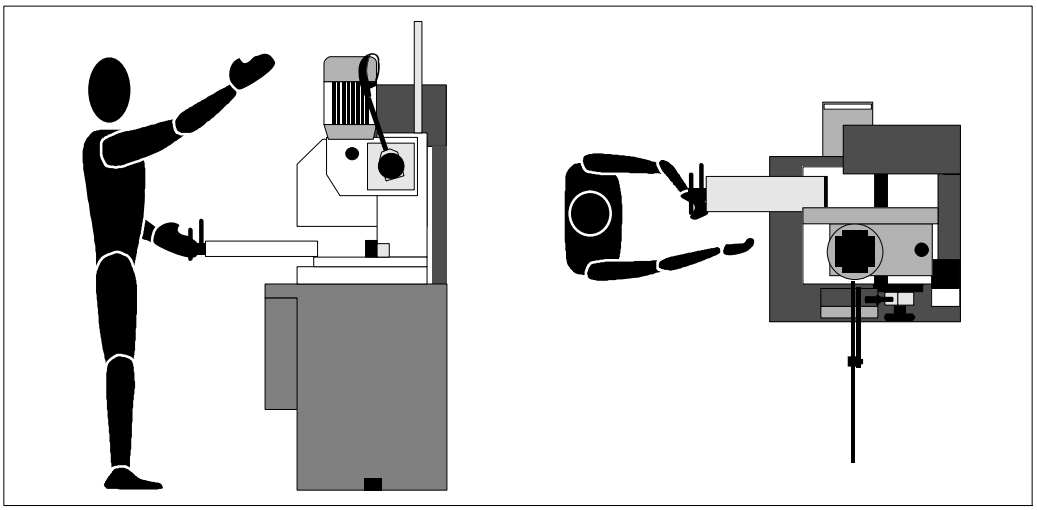
Check that the power supply cables and pneumatic feed systems comply with the maximum machine absorption values listed in the “Machine Specification” tables; replace if necessary.

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



Read this instruction manual carefully before working on the system. In the event of loss or damage, the user can request a new manual from MEP, indicating the characteristics of the system on the identification plate.



Wear protective gloves when handling the material, whether cut or to be cut, or when setting up the machine.



Never wear protective gloves while the machine is cutting.



Always wear proper goggles or protective glasses.



Always wear suitable protective footwear



A safety helmet must be worn when handling suspended loads



Wear a high−visibility jacket



Keep hands as clean as possible.



The mains plug must be disconnected from electrical outlet for the purposes of maintenance of electrical equipment, in the case of malfunction or when left unattended.



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.



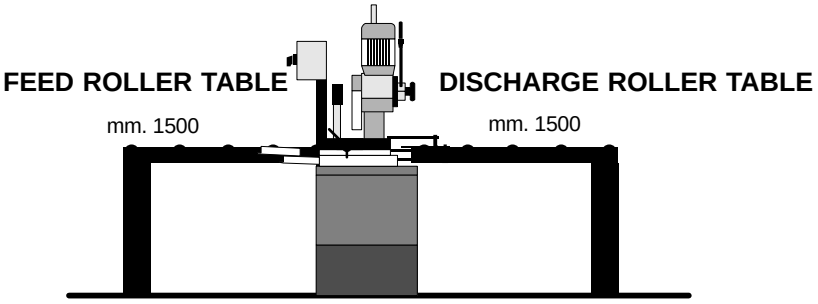
Do not wear oversize clothing with long sleeves, oversize gloves, bracelets, necklaces or any other object that may become entangled in the machine during working; long hair must be tied back and bunched.



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.





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



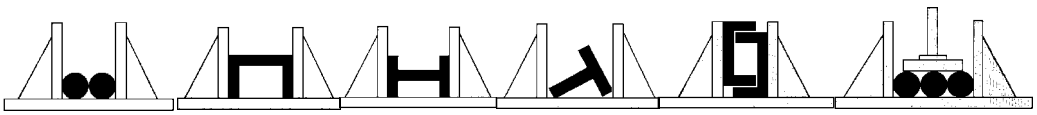
Remove equipment, tools or any other objects from the cutting zone; always keep the working area as clean as possible.



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



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





Never move the machine while it is cutting.



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



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



When using the pneumatic vice (version MA) check that the jaws actually move right up to and effectively block the piece, as the maximum travel in only 6 mm, and check that the clamping pressure is correct.



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



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



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

Machine safety devices

This use and maintenance manual is not intended as purely a guide for the use of the machine in a strictly productive environment, it is instead an instrument providing information on how to use the machine correctly and safely. The following standards are those specified by the EEC Committee in the directives regarding safety of machinery, health and safety at work, personal protection and safeguarding of the environment. These standards have been applied to the **TIGER 352** 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;
- Directive89/391/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

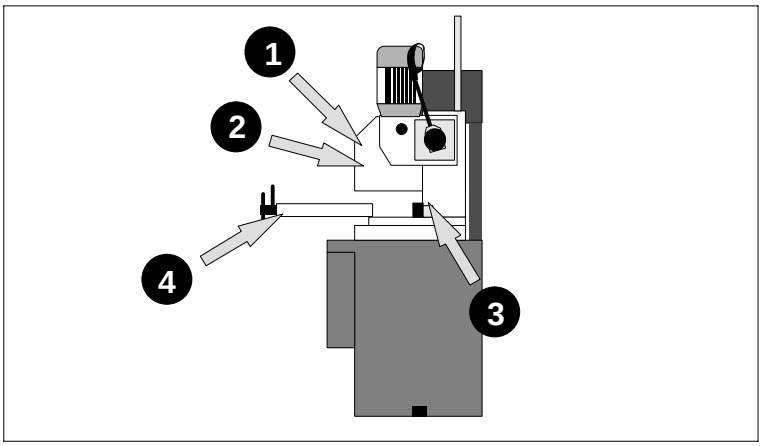
- Directive89/656/CE and Regulation 2016/425/UE on the use of personal protection devices.

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 disc guard fixed to the upright section that guides the movement of the head. The height of this guard can be regulated so that the only part of the blade exposed is that used for the actual cutting in accordance with EN 16093:2017;
2. Steel sheet guard of adjustable height located on the part of the blade guard between the operator and disc and used as splash guard;
3. vice with rag prevention device and double clamping for improved hold on workpiece (optional double mechanical or pneumatic vice);
4. On the MA version, the cutting vice is pneumatically operated by a manual control or foot pedal and has a maximum travel of 6 mm. The jaw that performs the actual clamping must be moved to within 2−3 mm from the workpiece.



Electrical equipment

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

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

Emergency devices

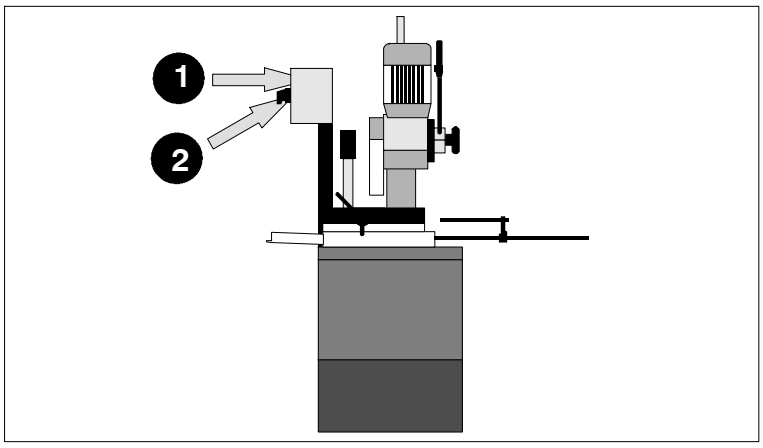
In accordance with Italian standard EN 60204-1:2006/AC:2010.

- **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».

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.

Interlocked protective guards:

2. **Automatic thermal-magnetic cutout switch with thermal-magnetic relay**: the machine auto switch, located on the control panel, 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.



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	Disc saw for metal
Model	**TIGER 352**
Reference standard	EN ISO 3746:2010

Results		
Test 1st	**Description**	80x80 mm pipe in FE37 steel Disc blade HSS–DMO5 0 350 T6
	Results	**Mean sound level (Leq) 76.42 dB (A)** Environmental correction (K) 2.97 dB(A) Peak sound power (Lw) 87.34 dB(A)
Test 2nd	**Descriprion**	Ø 50 mm solid tube in C40 steel. Disc blade HSS–DMO5 0 350 T6
	Results	**Mean sound level (Leq) 76,50 dB(A)** Environmental correction (K) 2.97 dB(A) Peak sound power (Lw) 87,42 dB(A)
Test 3rd	**Description**	30x60 mm solid tube in C40 steel. Disc blade HSS–DMO5 0 350 T6
	Results	**Mean sound level (Leq) 76,19 dB(A)** Environmental correction (K) 2.97 dB(A) Peak sound power (Lw) 87,12 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 **TIGER 352**.

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

- CEI EN 61000−6−2:2005 + AC:2005 Electromagnetic Compatibility (EMC) − Generic standard on immunity. Part 6−2: Industrial Environment.
- EN 50370−2:2003 Electromagnetic compatibility (EMC) − Product family standard for machine tools − Part 2: Immunity

The EUT is deemed to fulfil the immunity requirements without testing, because it contains no electonic control circuitry.

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

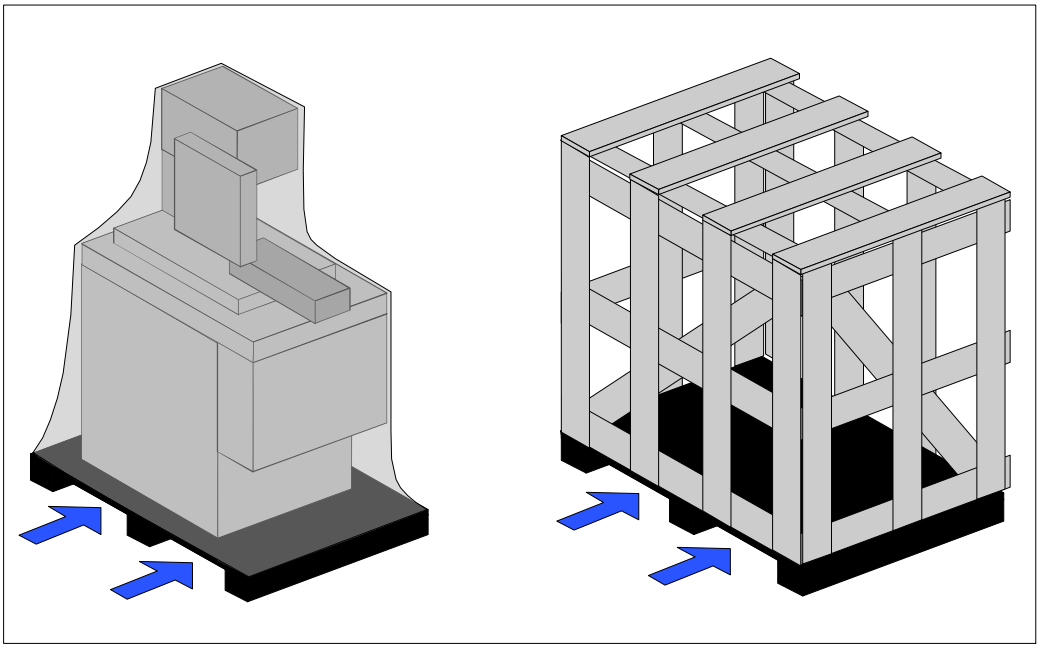
Machine installation

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:

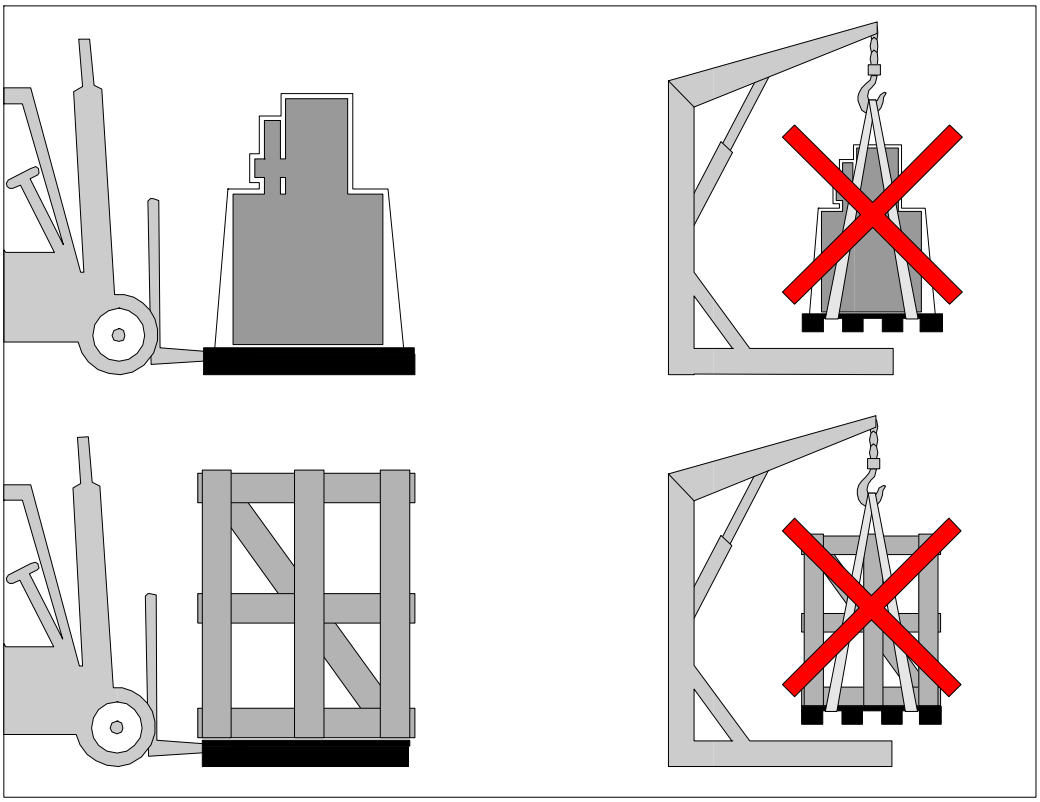


1. on a pallet with straps and heat−shrink plastic;
2. on a pallet with straps, heat−shrink plastic and a wooden crate.

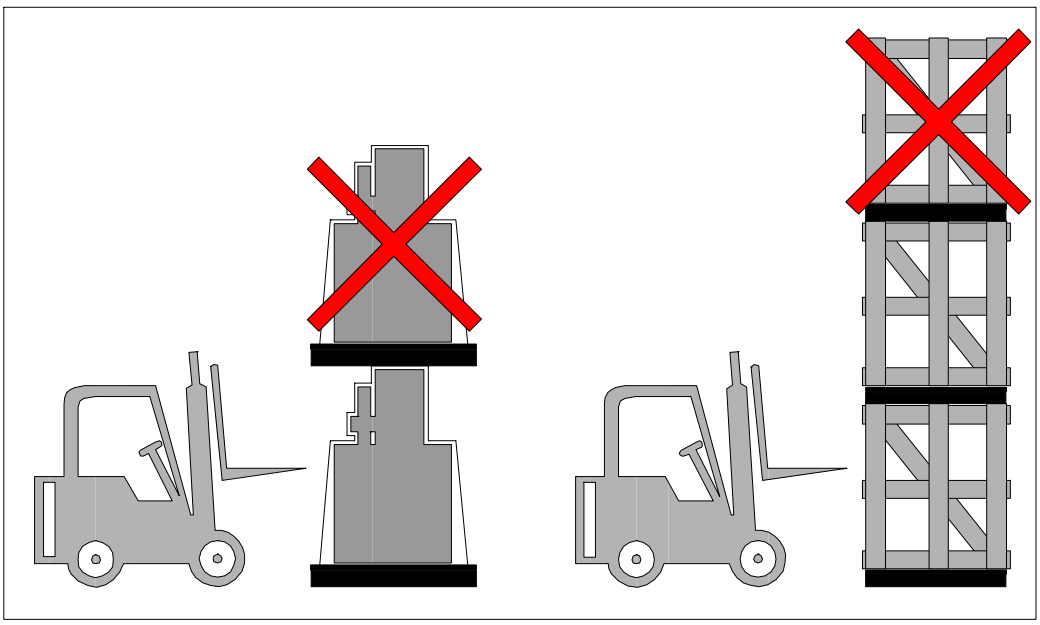
Warning In both cases, for correct balancing the machine must be handled using a fork−lift truck, inserting the tines at the points indicated by the arrows, using the reference marks on the crate itself.

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.

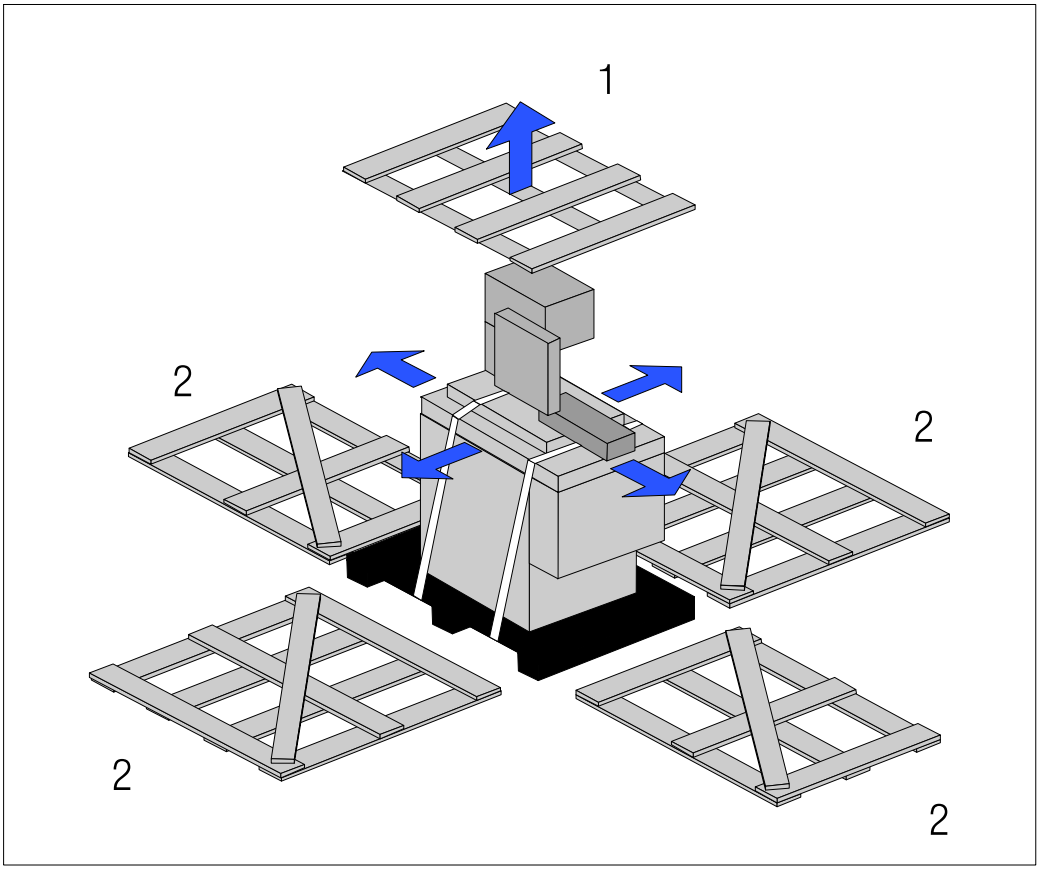


Attention When storing, machines palletized and shrink−wrapped must not be stacked two high, and machines pallettized and crated must not be stacked three high.

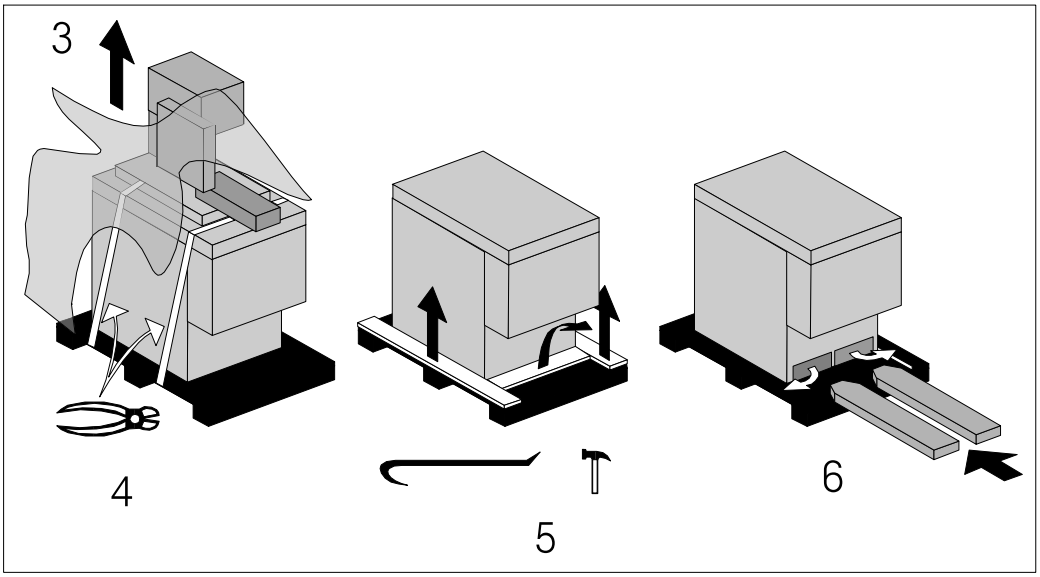


To install the machine, first remove the packing, paying particular attention not to cut any electric wires or hydraulic hoses; if necessary use pliers, a hammer and a cutter.
Open crate in the illustrated order:

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



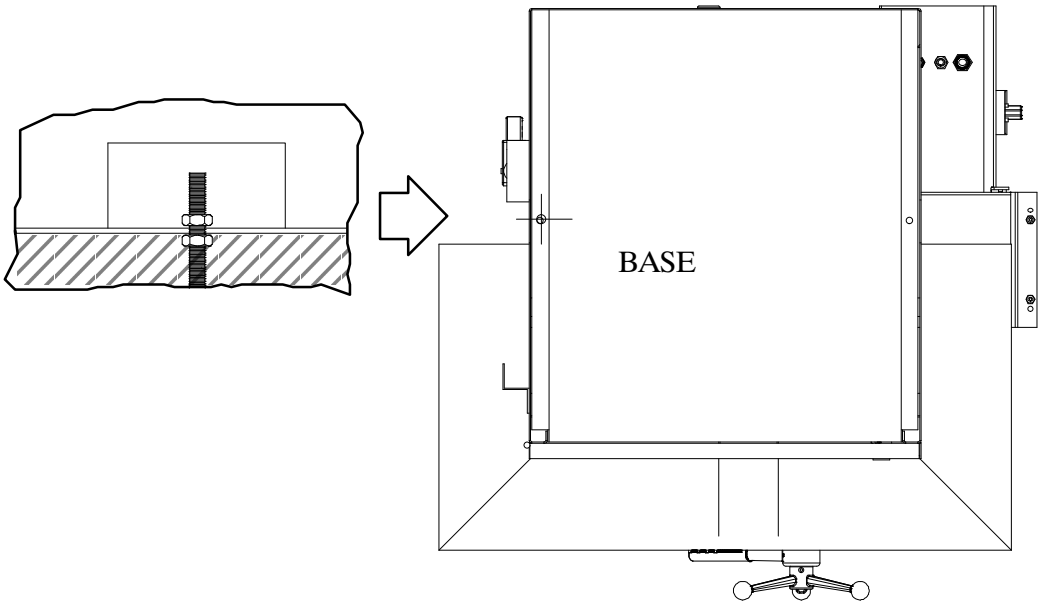
3. remove heat−shrink covering;
4. remove the straps;
5. remove nails from pallet securing planks and remove planks;
6. remove the front panel and insert fork tines.



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.

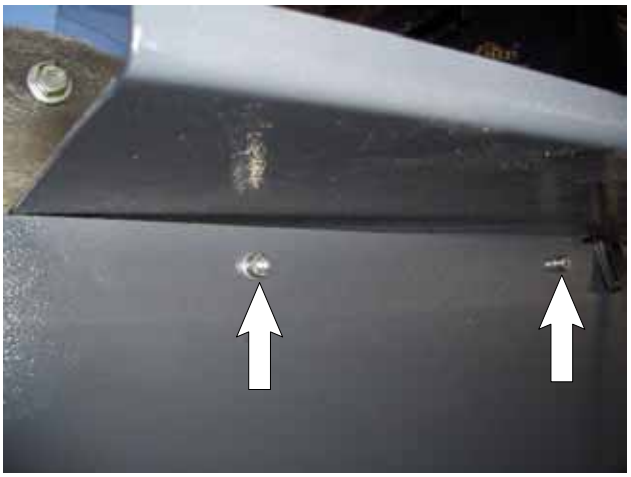


Installation of the refrigerant tray

For installing the refrigerant tray proceed as follows:

- ▶ remove the 4 screws in pairs on the basement sides, then lay the tray on the basement upper plane making the slots coincide with the holes of the screws.
- ▶ Fasten the screws indicated in the figure on both sides of the basement.





- ▶ If the sawing machine version is MA (automatic vice) disconnect the air supply pipe from the manual pneumatic valve.
- ▶ Install the refrigerant tray as previously described.
- ▶ Fasten the valve through the screws in the holes on the refrigerant tray so that the switch is to the operator's side, then connect again the air supply pipe.





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; check the compatibility of the differential value of the factory outlet with the absorption of the saw;
- 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 **TIGER 352** machine is supplied complete with:

CHARACTERISTICS	STANDARD	OPTIONAL
Pedestal with removable swarf collecting drawer and removable tank for coolant	✓	
Electric pump for lubrication/cooling of disc	✓	
Vice with rag prevention device and double workpiece clamping feature	✓	
Possibility of making angled cuts from 0° to 45° right and 60° left	✓	
Blade cleaning brush	✓	
Filter reducer unit (only in MA version)	✓	
Key operated safety switch, magneto−thermal overload cutout, minimum voltage coil, emergency device and low voltage system (24 Volt)	✓	
Pneumatic vertical vice (only MA version)*		✓
Circular blade HSS DMo5/M2 D.350x32x2.5 for solid sections and profiles*		✓
Set up for movement with transpallets	✓	
Pneumatic supplementary vice (only MA version)*		✓
Manual supplementary vice*		✓
Supplementary pedal control (only MA version)*		✓
Bar support		✓
KK200 roller table module for feed side, 1500 mm		✓
Feed side roller table support		✓
Discharge side roller table adapter		✓
KK200 roller table for discharge side, 1500 mm		✓
KK200 roller table for discharge side, 3000 mm		✓
KK200 roller table for discharge side, 4500 mm		✓
KK200 roller table for discharge side, 6000 mm		✓
5 l can of emulsible oil		✓
30/60/90/180 rpm spindle*		✓

***ACCESSORIES AVAILABLE ON REQUEST**

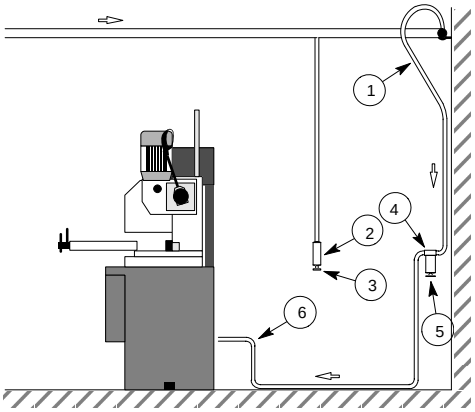
The bag of accessories is enclosed in the machine before being packed and contains:

- 3, 4, 5, 6, 8 and 10 mm Allen keys;
- 19 mm double open−ended and box wrenches;
- 20 mm Ø rod for cuts to measure with an 8 mm Ø ratchet fork and lever + VCE M8x35 Allen grub screw;
- arm with roller on which the bars to be cut rest and for fitting the feed side roller tables;
- this Use and Maintenance Manual.

Connection to the compressed air supply for MA version

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

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



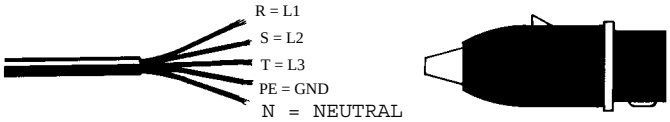
Connection to the power supply

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

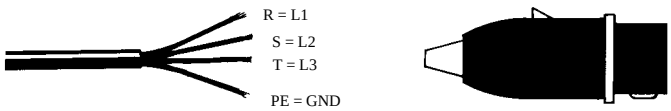
To connect the machine to the power supply, proceed as follows:

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

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

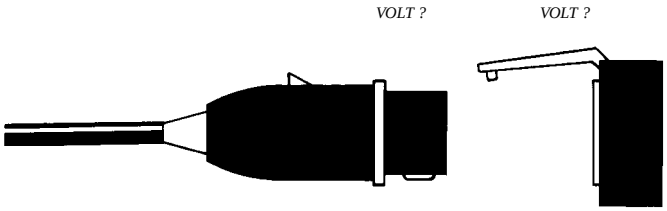


CONNECTION FOR **"4-CORE"** WIRE SYSTEMS WITH NEUTRAL

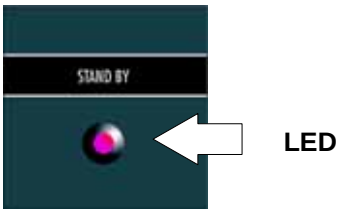


Attention When using systems with a neutral wire, special care must be taken when connecting the **blue** neutral wire, in that if it is connected to a phase wire it will discharge the **phase voltage** to the equipment connected for **voltage: phase–neutral.**

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

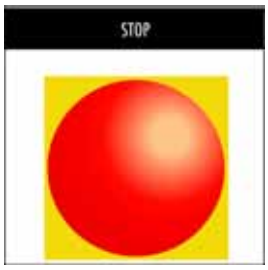


▶ Power up machine by rotating the main switch located on the right side of the control panel (The STAND BY LED lights up).



Check that the motor is rotating in the correct direction, as follows:

▶ make sure that the machine is not in an emergency condition (red mushroom−head pushbutton released);



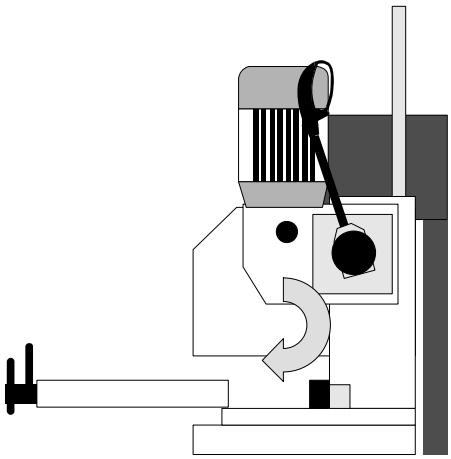
▶ select a cutting speed using the polarity change switch;



▶ operate the jog pushbutton on the manual head control lever;



▶ If all the above operations have been carried out correctly, the disc motor will start up and the disc will start to turn.



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

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

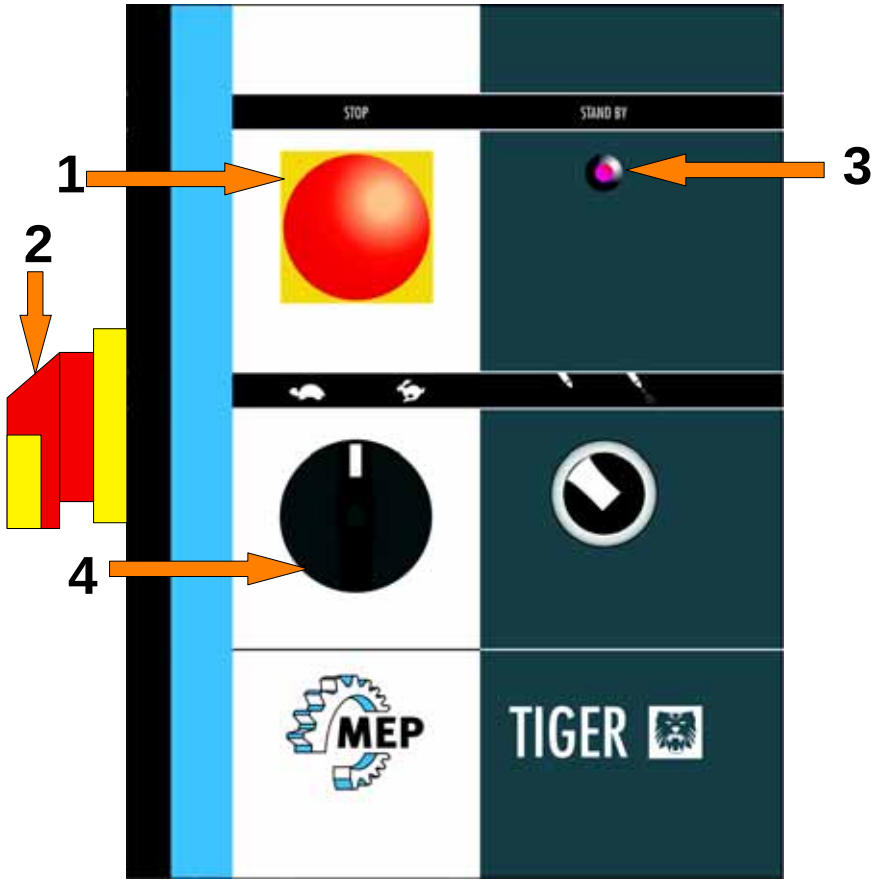
Description of machine operation

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 components of the **TIGER 352** control panel are shown in the diagram below. Each arrow has a number which corresponds to the descriptions that follow.



1 – EMERGENCY STOP PUSHBUTTON

Pressing this pushbutton stops the machining operations immediately and stops any blade movement. The emergency pushbutton, designed in accordance with all relevant safety standards, is installed in a position that makes it easily accessible at any moment of potential danger. Its red colour on a yellow background makes it extremely visible. To reset the pushbutton, rotate it 45°.

2 – MAIN MAGNETO–THERMAL SWITCH

On the left hand side of the control panel is a main switch with a door locking device. When turned to position 1 it switches on the power to the machine through the MINIMUM VOLTAGE COIL RESET and the DISC MOTOR MAGNETO–THERMAL RESET. This device has three systems for protecting against voltage drops. In fact, in the event of a voltage drop, all the electrical components are disengaged, the machine stops immediately and is prevented from restarting automatically when the power supply returns. Another function is that of resetting the thermal relay provided to protect against current overloads.

3 – STAND BY LED

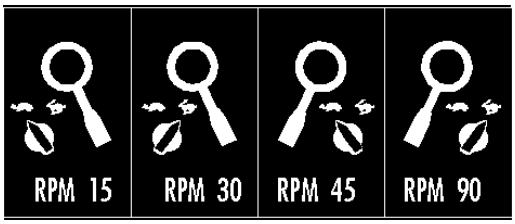
This either confirms machine start up or indicates an emergency state to the operator.

4 – POLARITY CHANGE SWITCH

Determines cutter blade rotation speed.

CUTTING SPEED SETTING

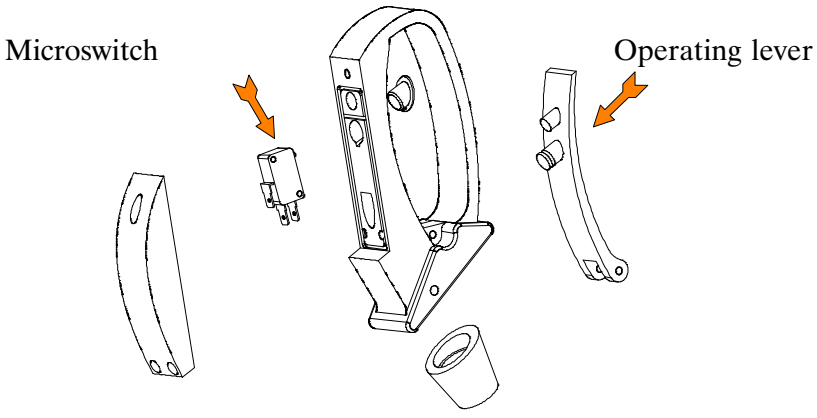
Data plate on the right hand side of the machine, showing the positions of the mechanical gearbox and commutator, to select the 4 cutting speeds of the **TIGER 352** 4 speed version.



N.B. If the machine is equipped with an optional 2/4 pole motor, the speeds obtained with the mechanical gearbox are: 30/60 rpm for the first speed and 90/180 rpm for the second speed.

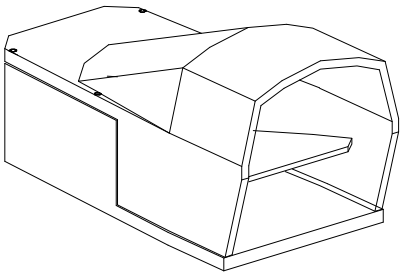
HEAD CONTROL LEVER MICROSWITCH

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



This microswitch is enabled when the machine is not in emergency condition. In accordance with the relevant standards in force, the 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.

OPTIONAL: FOOT PEDAL (MA VERSION)

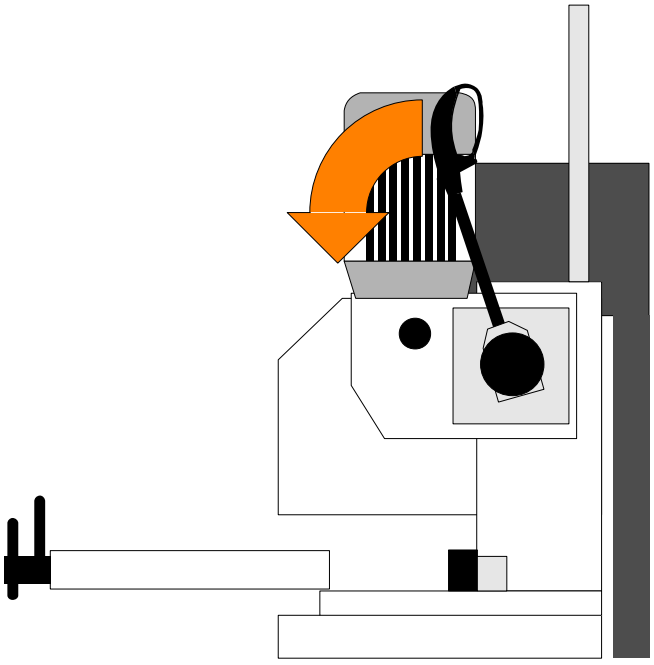


During normal machine functioning, this is enabled to open and close the clamp. This must be specified when ordering the machine.

Basic instructions for carrying out a cutting operation cycle

Manoeuvring the cutting head

The hand grip on the cutting head control lever, gives the operator a solid grip. He can start the blade rotating by pressing the activating lever on the microswitch, built in to the hand grip itself.

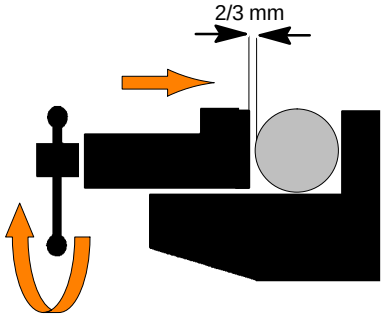


Clamping the work piece in the vice

The vice is opened and closed with a hand wheel, or by a foot pedal in the MA version. In any case, the part to be processed should always be clamped following this procedure:

- ▶ Make sure that the material dimensions are within the machine's cut capacity specified by the manufacturer
- ▶ switch on the machine at the reset switch;

- ▶ position the material in the vice and calculate the length of cut (using the rods for cuts to measure);
- ▶ close the vice manually up to the workpiece to cut, leaving a minimum distance of 2÷3 mm In the MA version, the automatic vice is enabled and can be controlled using the on/off selector on the base or foot pedal;



- ▶ make sure the workpiece is securely clamped in the vice by trying to move it manually.

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

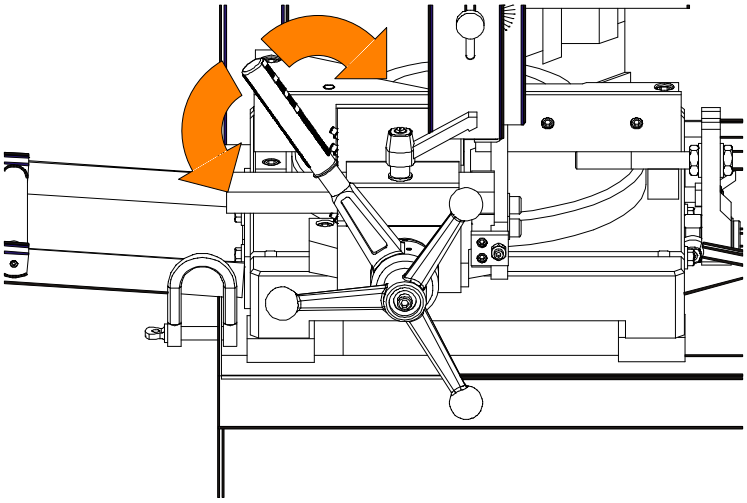
Width of cut

The machine is fitted with barriers which adjust to suit to the workpiece.

- ▶ Adjust the deburring bar if necessary.

Quick vice clamping

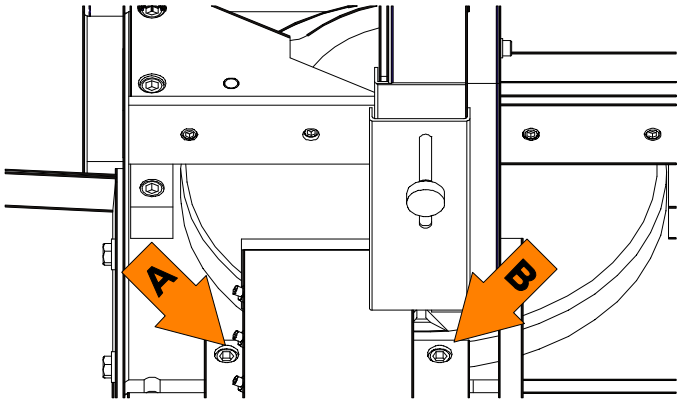
In the standard version the cutting vice is equipped with a quick clamping device that uses a cam system. Turn the lever located behind the vice clamping handwheel to clamp or release the workpiece quickly. Before being closed using the quick clamping system, the vice must in any case be moved to within about 2–3 mm of the material to be cut.



Transverse position of the vice

Position the cutting vice as close as possible to the cutting zone to ensure that vibrations are cut down and that the cutting zone is provided with greater cover. To move the vice body transversely, proceed as follows:

- slacken the screws (A–B) that clamp the lead nut locking plate;
- move the vice body along the groove cut into the fixed table until it is in the desired position;
- tighten the two locking screws on the lead nut.



Preliminary check list for cutting operation

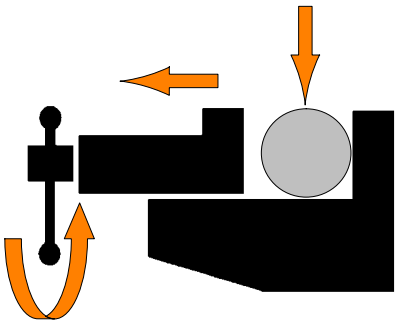
To guarantee complete safety during cutting cycles, the operator should work through a check list of the entire apparatus, checking:

- that the disk guard can move freely;
- that the right cut angle has been set and the turntable is locked in position;
- that the work piece is properly clamped in place;
- that the blade teeth are suitable for the material to be cut;
- that the speed selected is right for the kind of piece to be cut;
- that all protections are in place and correctly locked.

Manual operating cycle

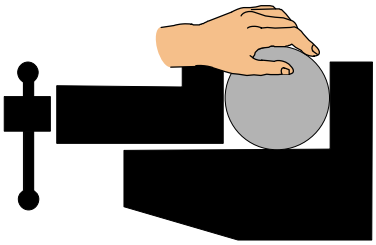
Sequence of operations for performing a cut:

- power up the machine by pressing the reset button;
- position the workpiece in the vice and calculate the length of cut (using the measuring rod for cuts to measure).

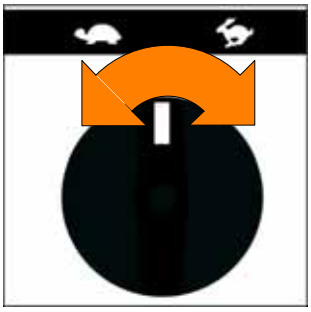


- Close the vice manually up to the workpiece to cut, leaving a minimum distance of 2÷3 mm. In the MA version, the automatic vice is enabled and can be controlled using the on/off selector on the base or foot pedal.

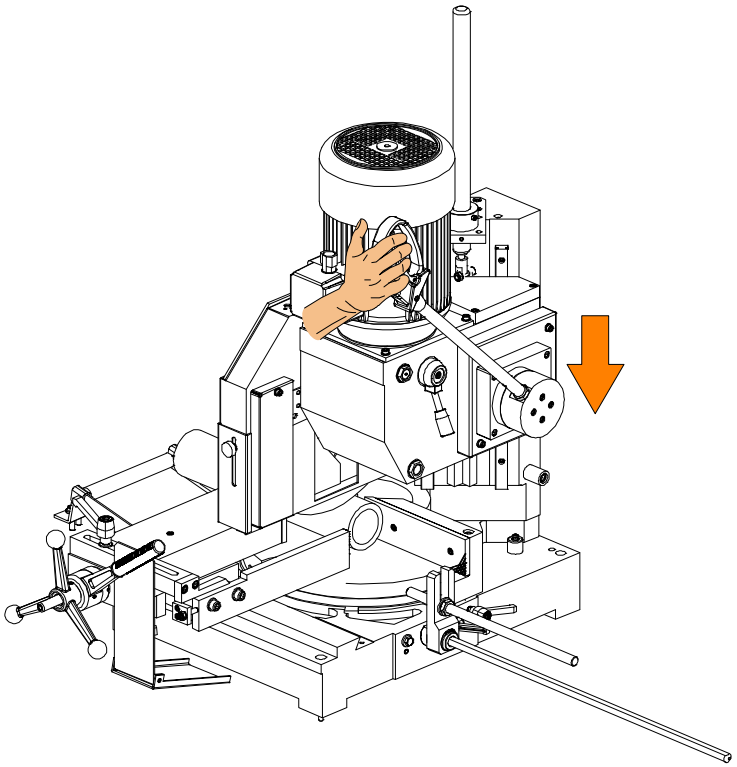
▶ Make sure the workpiece is securely clamped in the vice by trying to move it manually.



▶ Select the cutting speed on the “Polarity change switch” in accordance with the type of material to cut (shape, thickness, hardness, etc.).

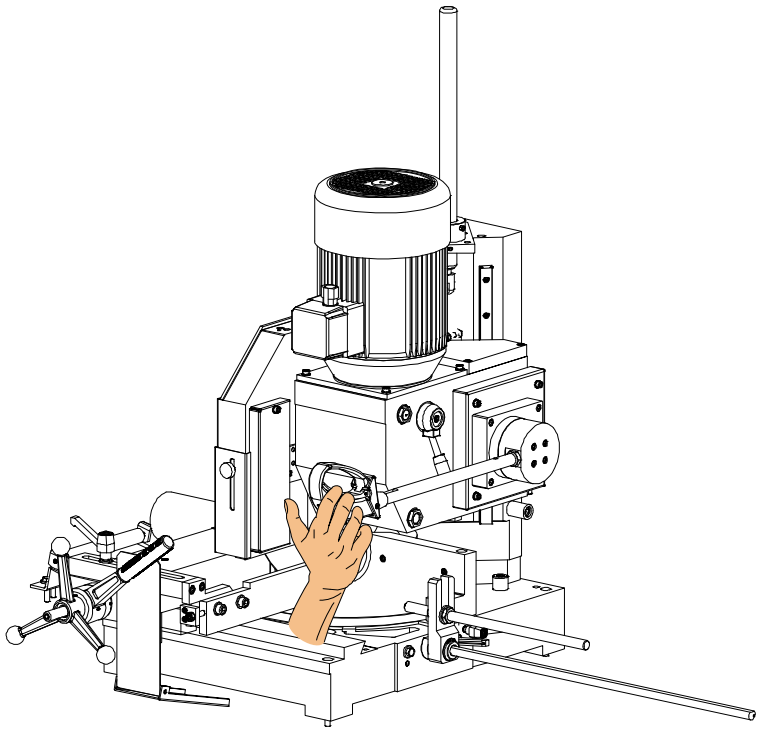


▶ Grip the cutting head control lever and near the blade to the material to be cut. At a distance of about 10 mm start−up the rotation of the blade by pressing the micro−switch on the hand grip.



▶ The motor starts up and starts the blade moving, at the same time starting the lubricant/coolant pump.

▶ If the travel of the head control lever is not sufficient to complete the cut, move the lever outwards (to the right) and return upwards then find another engagement position to complete the cutting operation;

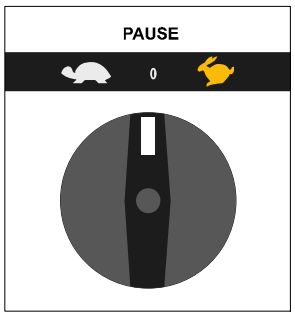


▶ at the end of the cut, the head can be raised;

▶ Remove the workpiece from the vice, either using the vice handwheel or the rapid locking lever. In the MA version use the vice open/close pushbutton on the base.

Attention

By turning the speed switch to the “0−PAUSE” position, the machine stops normally in safety conditions. To restart processing, it is necessary to turn the polarity switch to the desired speed (hare / tortoise) and press the microswitch on the handle.

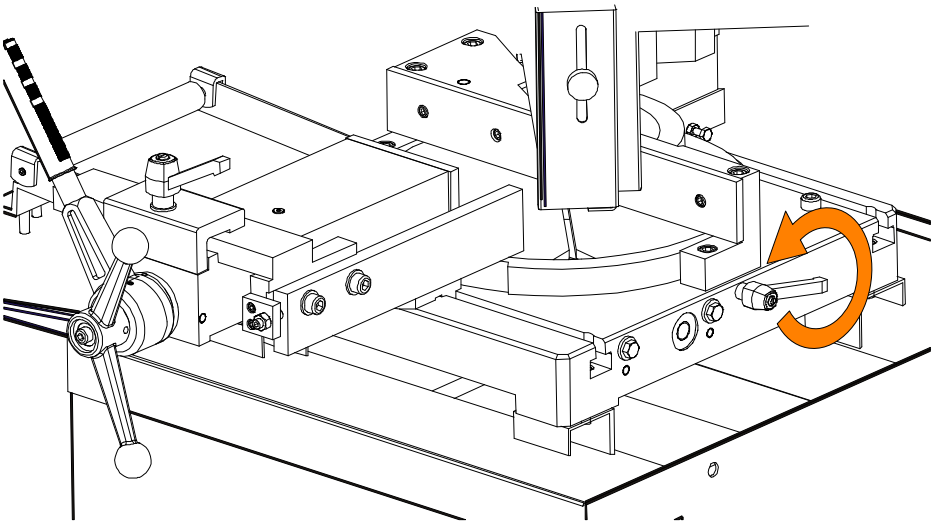


Angled cuts

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° and 60° to the left

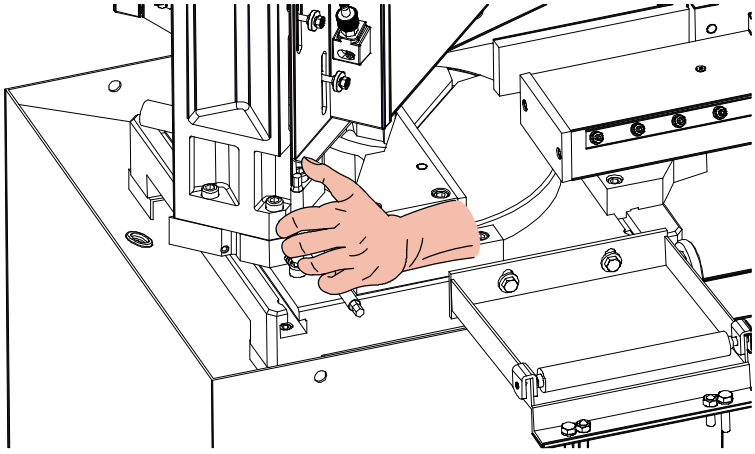
- ▶ Loosen the ratchet lever located at the right of the slideway;
- ▶ rotate the tool head until it's tight against the stop, and check that it's at 455 on the scale on the slideway;



- ▶ tighten the ratchet lever and cut the part.

If the cut has to be done at an angle of 60° left, the stop on the back of the slideway must be removed:

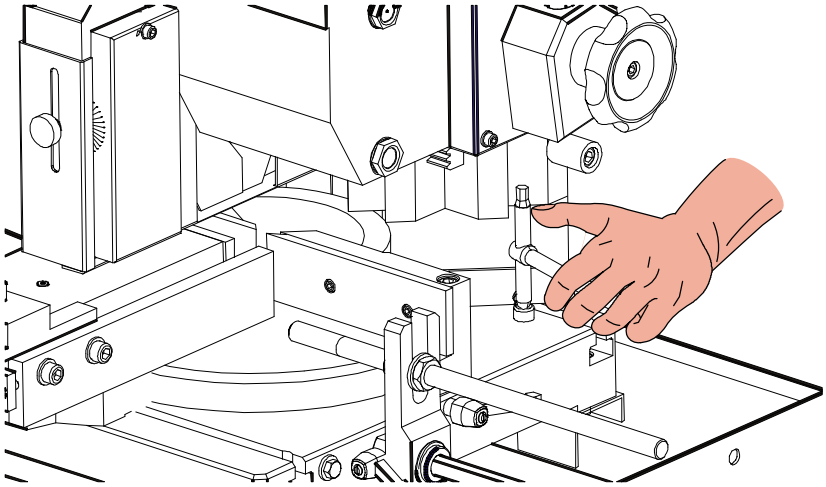
- ▶ remove the stop at 45° left;



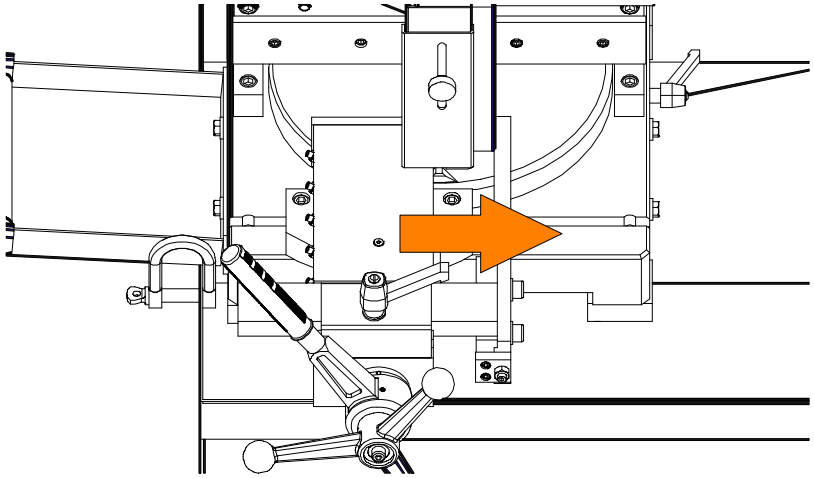
- ▶ rotate the tool head to 60° left, clamp the turntable and cut the part.

Angled cuts 45° to the right

- Loosen the ratchet lever located at the right of the slideway;
- Remove the cutting stop at 0°;

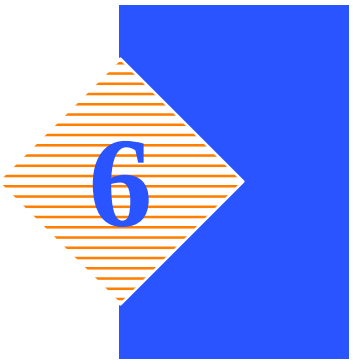


- lift the tool head up and rotate it, making sure that the cutter disk does not collide with the vice;
- move the vice from left position to right position
- if mounted, remove the cut−to−size rod.



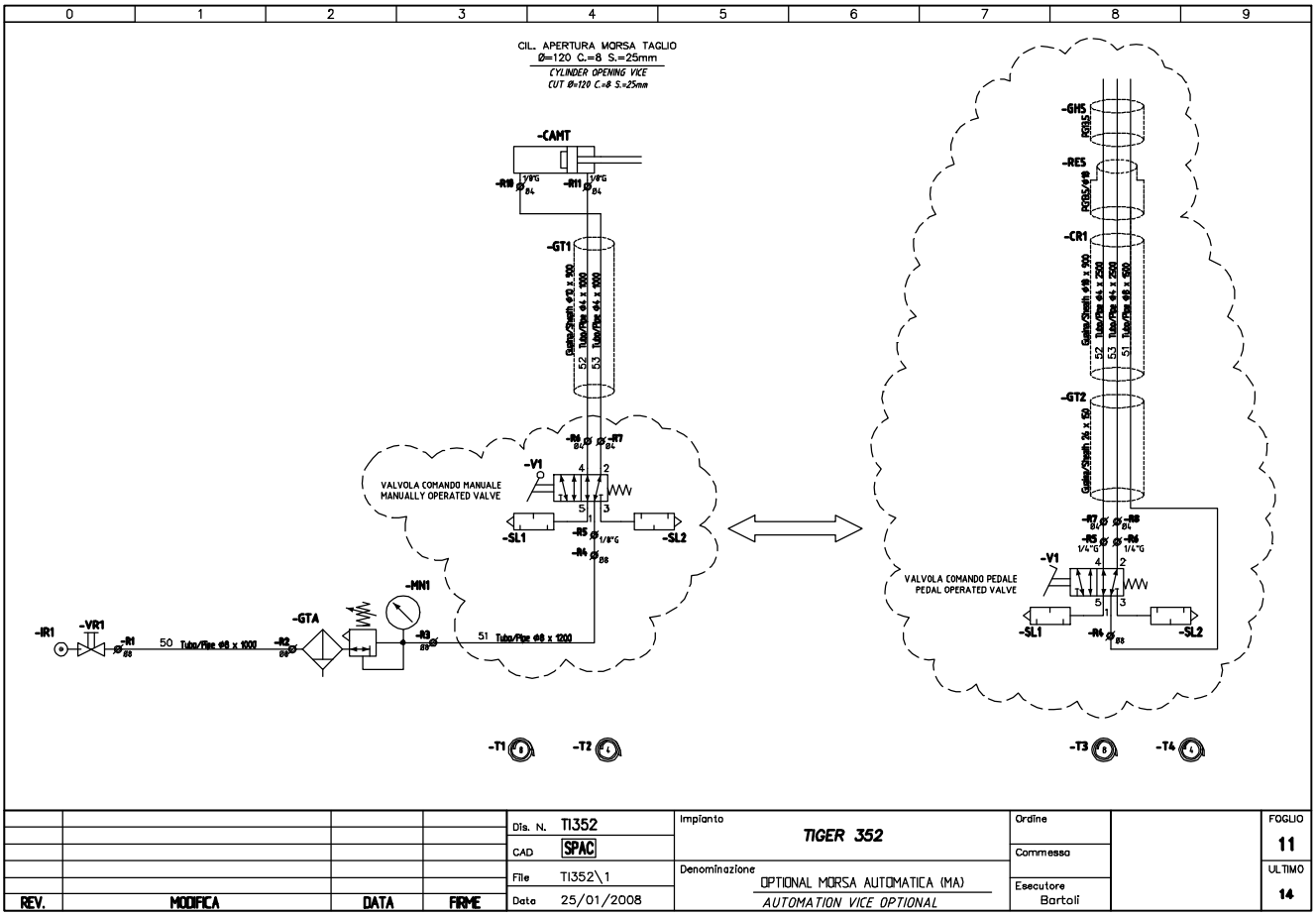
- Lock the turntable and cut the part.

Diagrams, exploded views and replace− ment parts



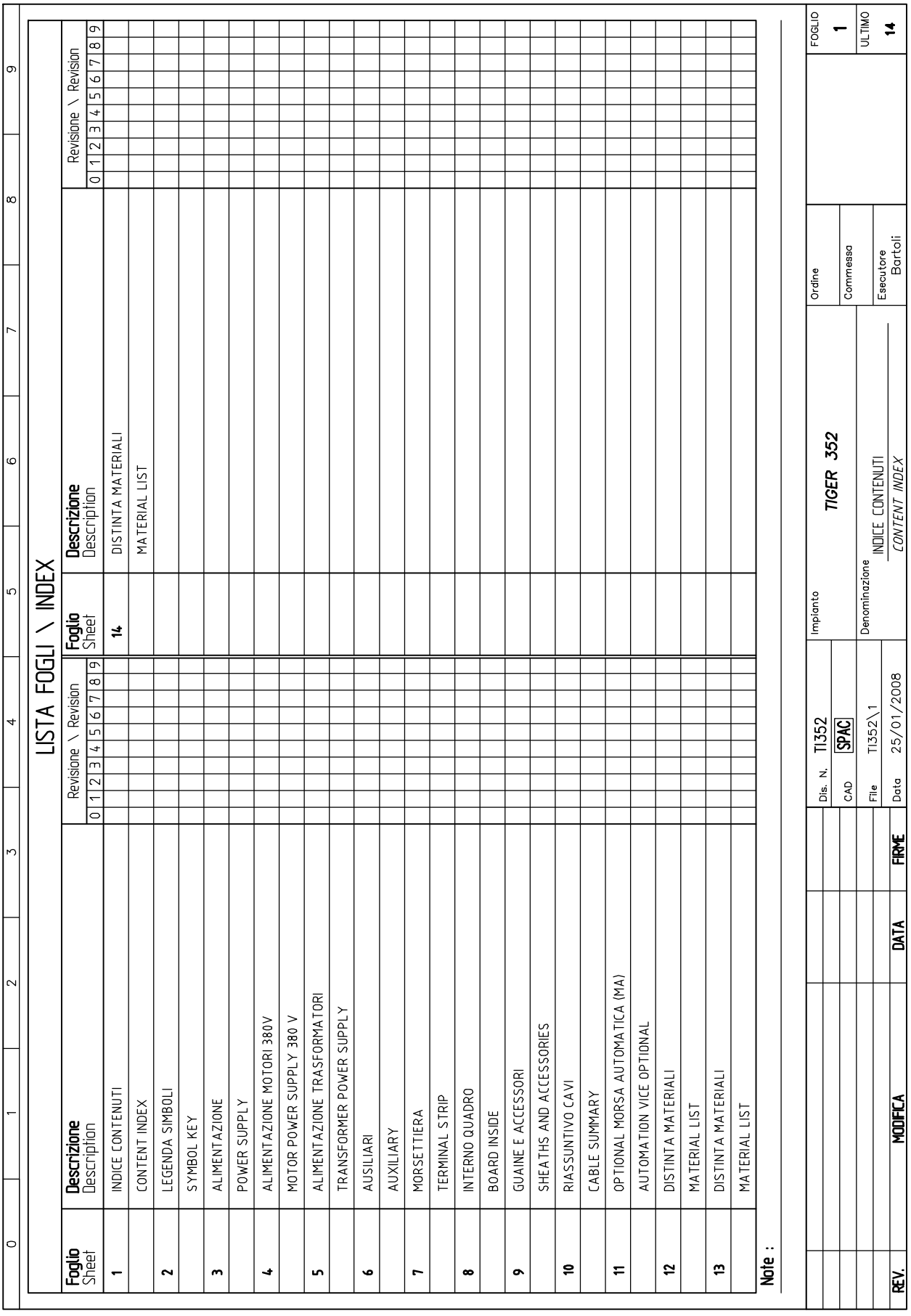
This chapter contains functional diagrams and exploded views of the **TIGER 352**. This document is intended to help in identifying the location of the various components making up the machine, giving information useful in carrying out repair and maintenance operations; This chapter will also enable the user to order replacement parts with no risk of misunderstanding, as all parts are given codes.

Pneumatic diagram (MA version)



REV.	MODIFICA	DATA	FIRME	Dis. N. TI352	Impianto TIGER 352	Ordine	FOGLIO 11
				CAD SPAC		Commessa	ULTIMO 14
				File TI352\1	Denominazione OPTIONAL MORSA AUTOMATICA (MA)	Esecutore Bartoli	
				Data 25/01/2008	AUTOMATION VICE OPTIONAL		

Standardised Wiring Diagrams



LISTA FOGLI \ INDEX

Foglio Sheet	Descrizione Description	Revisione \ Revision 0 1 2 3 4 5 6 7 8 9	Foglio Sheet	Descrizione Description	Revisione \ Revision 0 1 2 3 4 5 6 7 8 9
1	INDICE CONTENUTI		14	DISTINTA MATERIALI	
	CONTENT INDEX			MATERIAL LIST	
2	LEGENDA SIMBOLI				
	SYMBOL KEY				
3	ALIMENTAZIONE				
	POWER SUPPLY				
4	ALIMENTAZIONE MOTORI 380V				
	MOTOR POWER SUPPLY 380 V				
5	ALIMENTAZIONE TRASFORMATORI				
	TRANSFORMER POWER SUPPLY				
6	AUSILIARI				
	AUXILIARY				
7	MORSETTIERA				
	TERMINAL STRIP				
8	INTERNO QUADRO				
	BOARD INSIDE				
9	GUAINE E ACCESSORI				
	SHEATHS AND ACCESSORIES				
10	RIASSUNTIVO CAVI				
	CABLE SUMMARY				
11	OPTIONAL MORSA AUTOMATICA (MA)				
	AUTOMATION VICE OPTIONAL				
12	DISTINTA MATERIALI				
	MATERIAL LIST				
13	DISTINTA MATERIALI				
	MATERIAL LIST				

Note :

REV.	MODIFICA	DATA	FIRME

Dis. N. TI352
CAD SPAC
File TI352\1
Data 25/01/2008

Impianto
Denominazione
TIGER 352
INDICE CONTENUTI
CONTENT INDEX

Ordine
Commessa
Esecutore Bartoli

FOGLIO 1
ULTIMO 14

Sim.\Sym.	File	Descrizione\Description
	H12	LED con resistenza *LED WITH RESISTOR*
	M2	Motore asincrono trifase *THREE PHASE INDUCTION MOTOR*
	M110	Motore asincrono trifase 6 poli *SIX PHASE INDUCTION MOTOR*
	Q1360	Int. automatico magnetotermico sezionatore tripolare *THREE PHASE AUTOMATIC SWITCH*
	S2	Comando a Pulsante NO *PUSH BUTTON NO*
	S4C	Pulsante di emergenza NC *EMERGENCY PUSH BUTTON NC*
	KA1	Bobina rele' Aux *AUXILIARY RELAY COIL*
	KM1	Bobina contattore *CONTACTOR COIL*
	BLK10	Trasformatore per ausiliari *TRANSFORMER FOR AUXILIARY*
	BLK41	Raccordo SX *CONNECTOR SX*
	BLK42	Raccordo DX *CONNECTOR DX*

Sim.\Sym.	File	Descrizione\Description
	BLK43	Tubo corrugato *CORRUGATED PIPE*
	BLK44	Riduzione PG *PG ADAPTER*
	BLK47	Pressa-cavo PG *PG STOP CABLE*
	BLK49	Pressa-cordone PG *PG FLEXIBLE CORD STOP*
	BLK51	Dado PG *PG NUT*
	BLK56	Terminale a puntale *TERMINAL*
	BLK57	Filo unipolare *WIRE*
	BLK58	Fascette plastiche di fissaggio *PLASTIC CLAMP*
	BLK60	Terminale a occhiello *TERMINAL*
	BLK66	Sacchetto portafusibile *BAG FUSE*
	SEL__VEL	Selettore a tre posizioni stabili 0 centrale *SELECTOR THREE STABLE ZERO CENTRAL POSITIONS*

Sim.\Sym.	File	Descrizione\Description
	BLK106	Raccordo tubo *PIPE FITTING*
	FFLP40	Valvola di esclusione *ON-OFF VALVE*
	FFLP51	Silenziatore *SILENCER*
	FFLP78B	Cilindro a doppio effetto *DOUBLE ACTING CYLINDER*
	FFLP155	Valvola *VALVE*
	FFLP176	Riduttore di pressione con manometro *PRESSURE REDUCING VALVE WHITE MANOMETER*

REV.	MODIFICA	DATA	FIRME

Dis. N.	TI352
CAD	SPAC
File	TI352\1
Data	25/01/2008

Impianto: *TIGER 352*

Denominazione: LEGENDA SIMBOLI / *SYMBOL KEY*

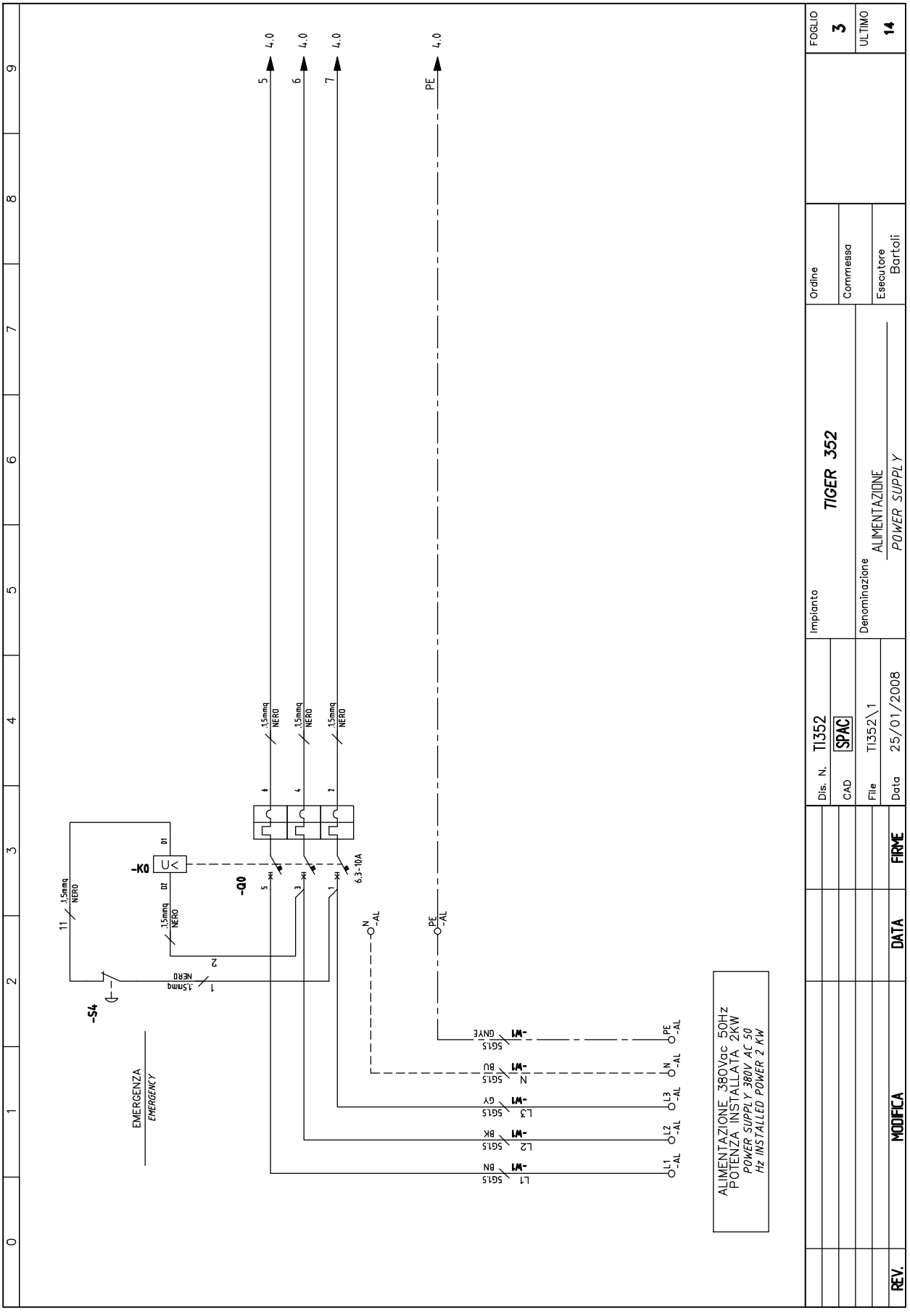
Ordine

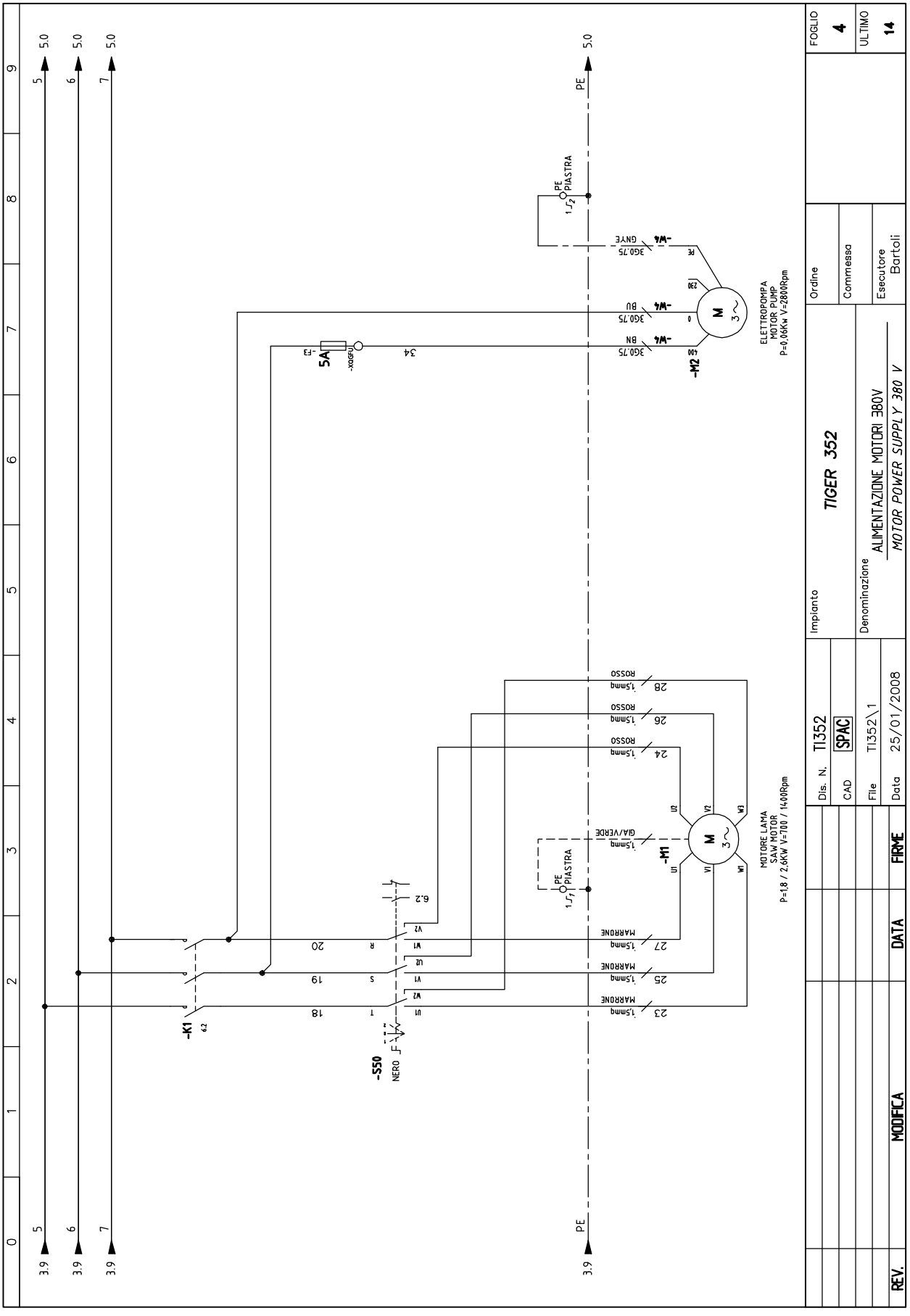
Commessa

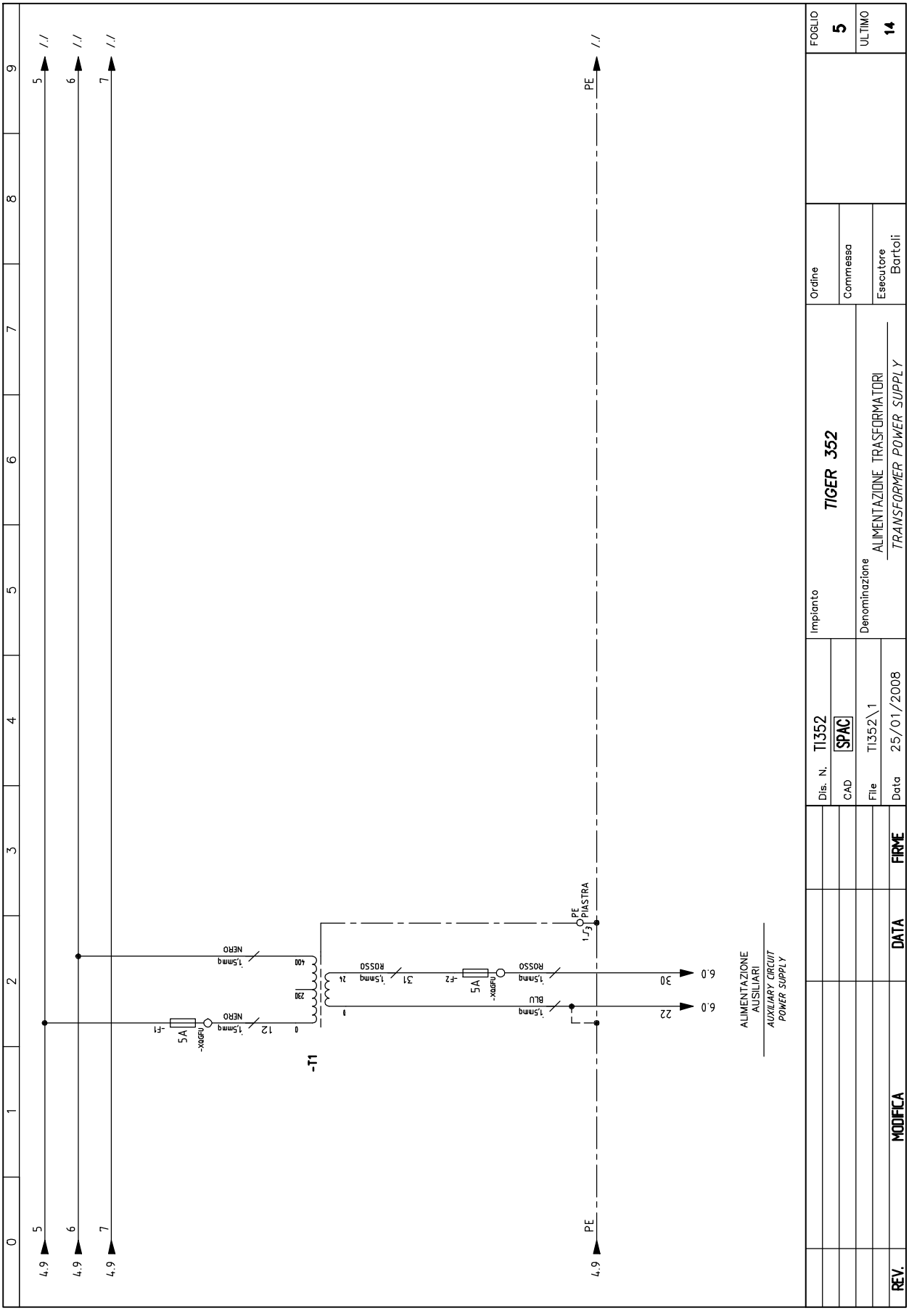
Esecutore: Bartoli

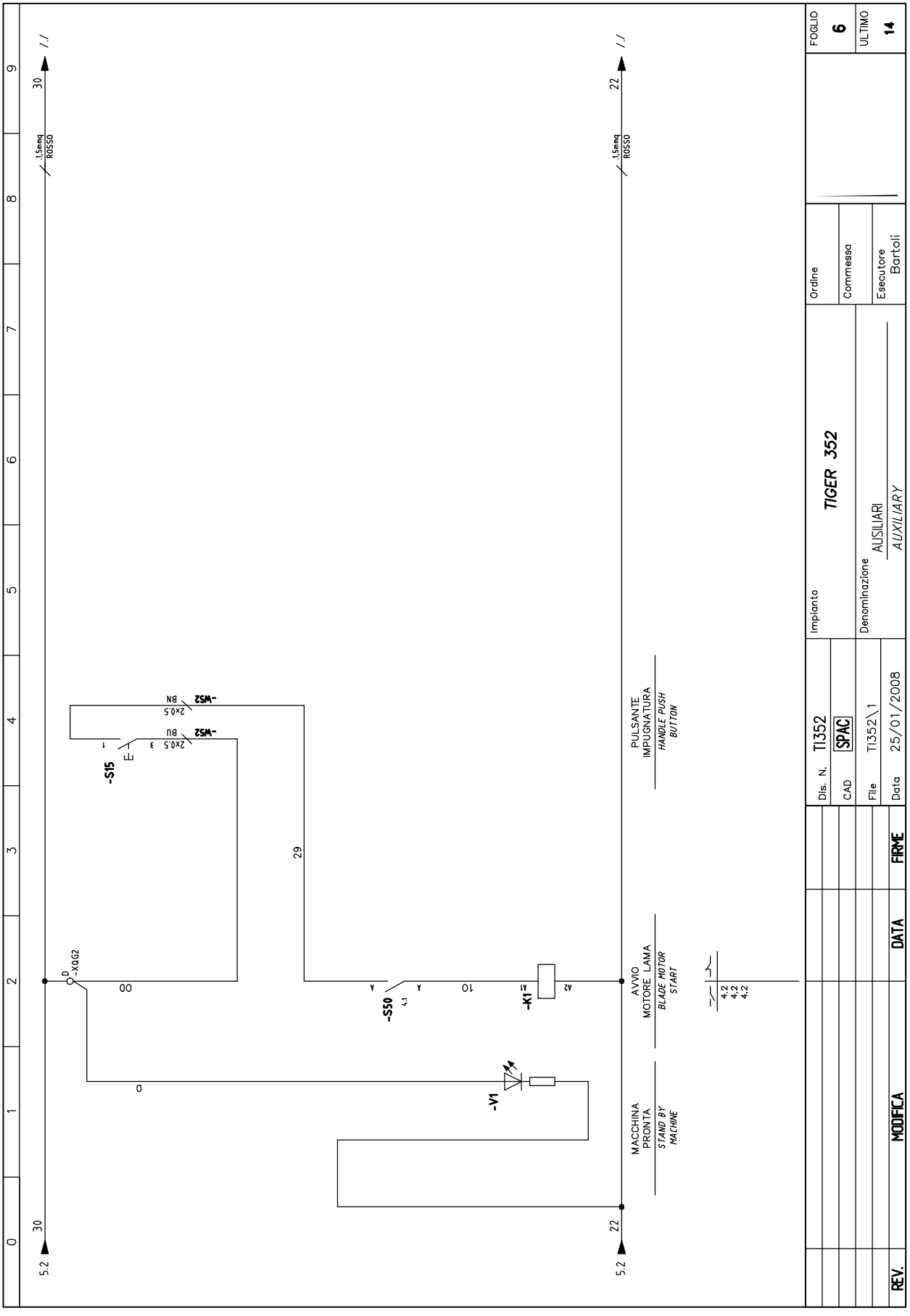
FOGLIO **2**

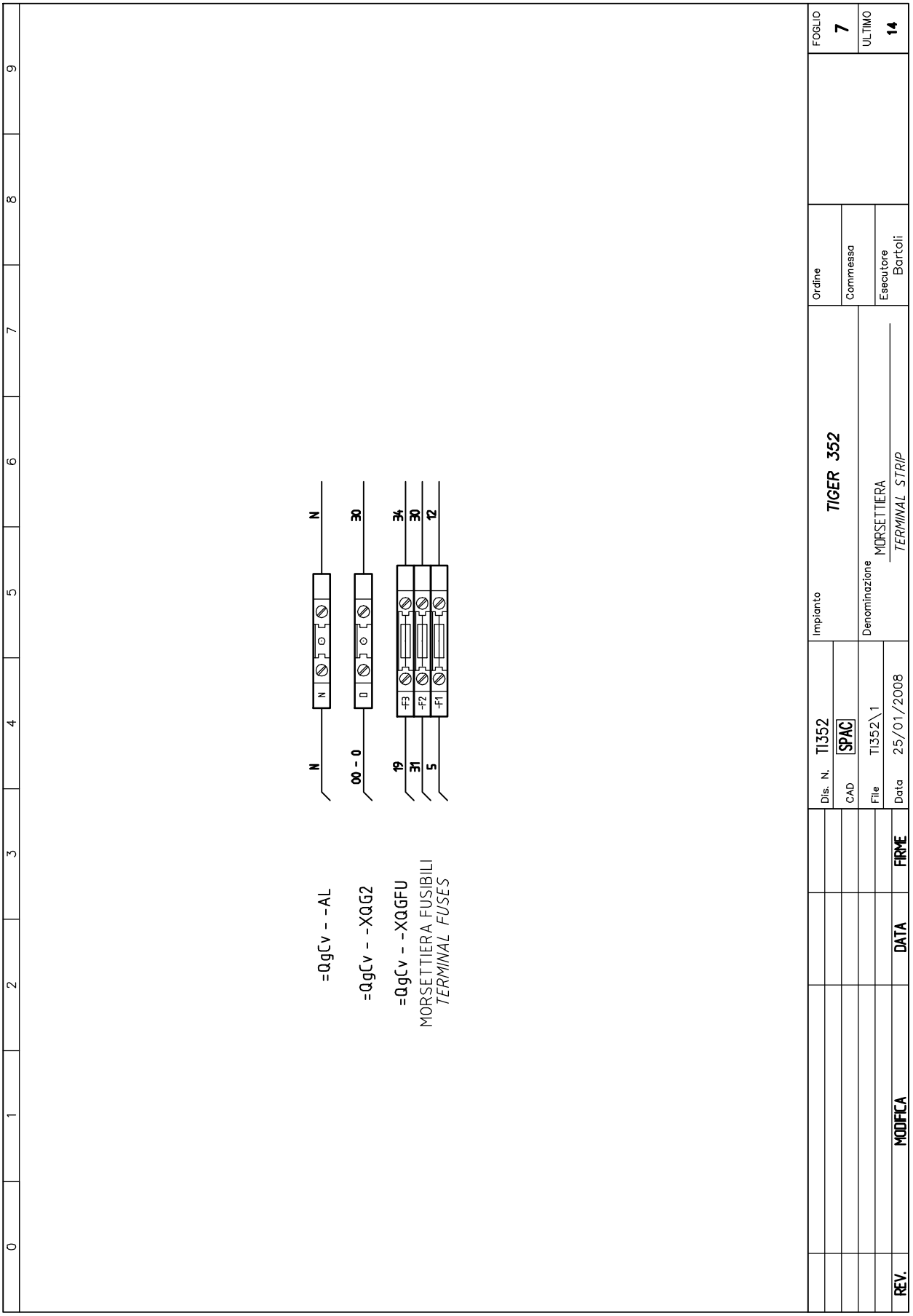
ULTIMO **14**

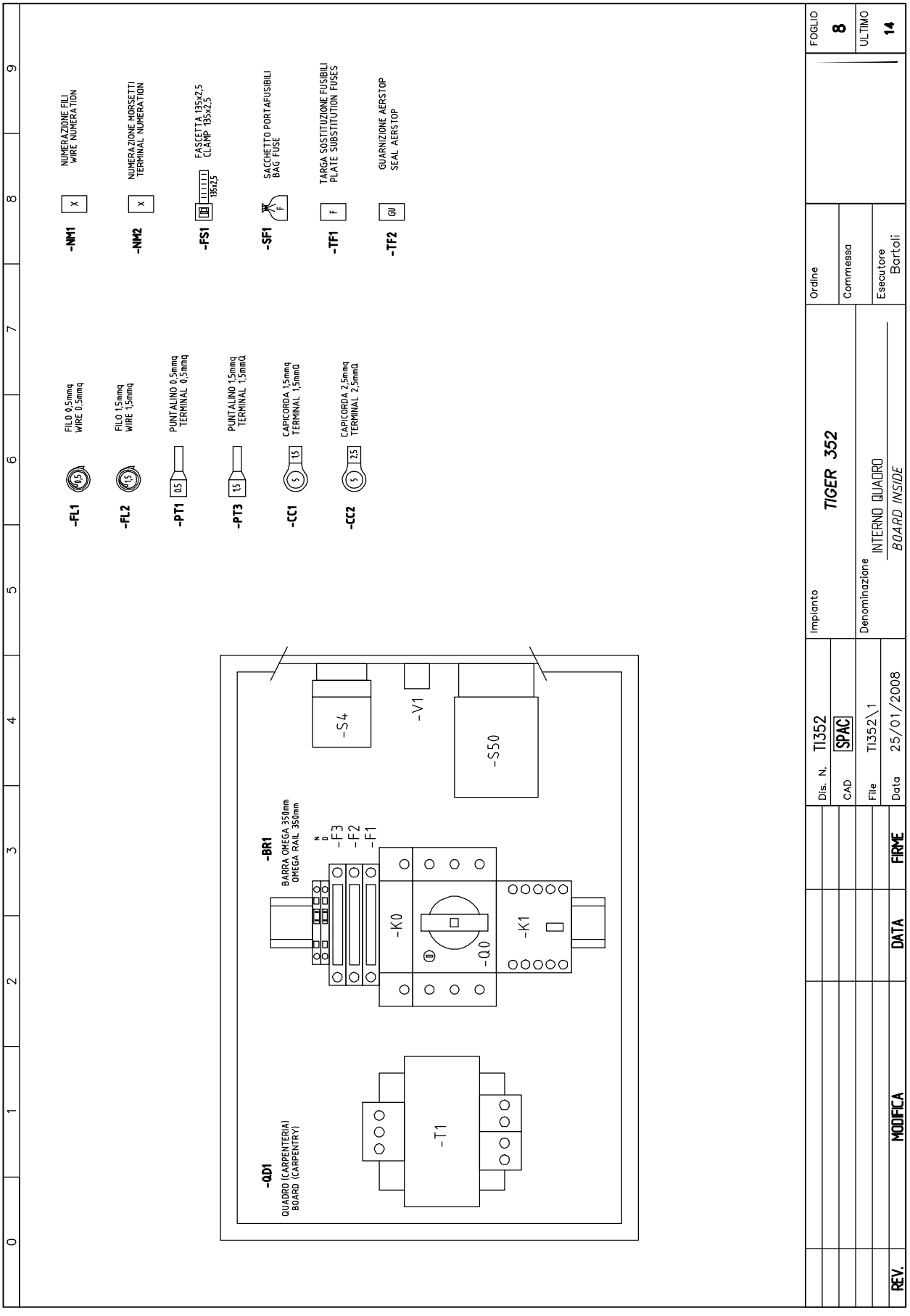

ALIMENTAZIONE 380Vac 50Hz
POTENZA INSTALLATA 2KW
POWER SUPPLY 380V AC 50
Hz INSTALLED POWER 2 KW
EMERGENZA
EMERGENCY
-S4
-K0
-Q0
-W1
6.3-10A
1,5mmq NERO
4,0
PE
N -AL
PE -AL
L1 -AL
L2 -AL
L3 -AL
Impianto
TIGER 352
Denominazione
ALIMENTAZIONE
POWER SUPPLY
Ordine
Commessa
Esecutore
Bartoli
Dis. N. TI352
CAD SPAC
File TI352\1
Data 25/01/2008
FOGLIO 3
ULTIMO 14
REV.
MODIFCA
DATA
FIRME

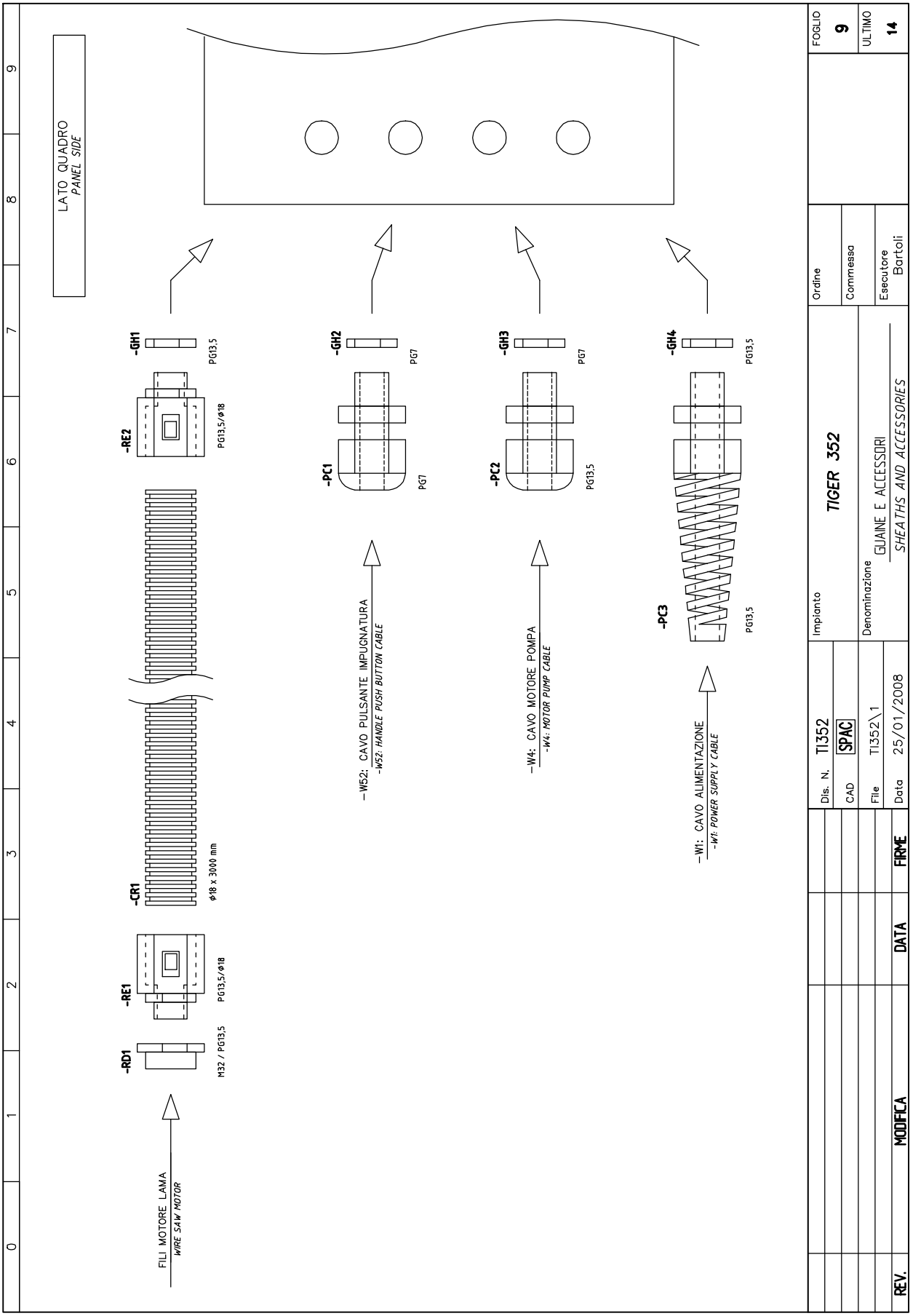

TIGER 352
ALIMENTAZIONE MOTORI 380V
MOTOR POWER SUPPLY 380 V
Impianto
Denominazione
Dis. N. TI352
CAD SPAC
File TI352\1
Data 25/01/2008
Ordine
Commessa
Esecutore Bartoli
FOGLIO 4
ULTIMO 14
REV. MODIFCA DATA FIRME
ELETTROPOMPA
MOTOR PUMP
P=0,06Kw V=2800Rpm
MOTORE LAMA
SAW MOTOR
P=1,8 / 2,6KW V=700 / 1400Rpm
-M1
-M2
-K1
-S50
5A
PE PIASTRA
MARRONE
ROSSO
GIA/VERDE
NERO

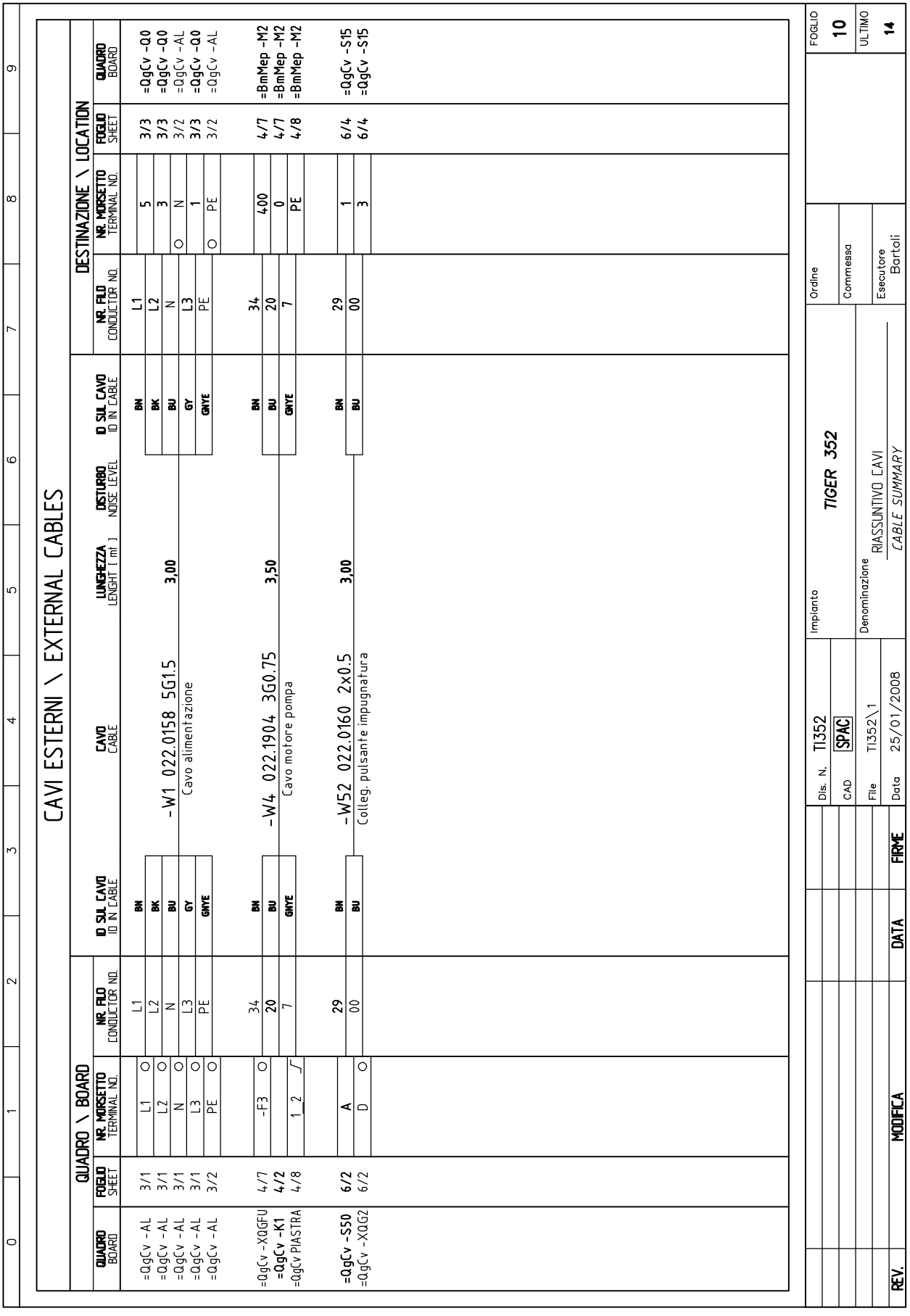

TIGER 352
TRANSFORMER POWER SUPPLY
ALIMENTAZIONE TRASFORMATORI
Impianto
Denominazione
Ordine
Commessa
Esecutore Bartoli
Dis. N. TI352
CAD SPAC
File TI352\1
Data 25/01/2008
FOGLIO 5
ULTIMO 14
REV.
MODIFCA
DATA
FIRME
ALIMENTAZIONE AUSILIARI
AUXILIARY CIRCUIT POWER SUPPLY
-T1
-F1
-F2
5A
-XAGFU
NERO
ROSSO
BLU
PE PIASTRA
PE


FOGLIO 6
ULTIMO 14
Impianto TIGER 352
Denominazione AUSILIARI
AUXILIARY
Ordine
Commessa
Esecutore Bartoli
Dis. N. TI352
CAD SPAC
File TI352\1
Data 25/01/2008
REV. MODIFCA DATA FIRME
1,5mmq ROSSO
30
22
5.2
-SI5
-WS2 2X0,5 BU
-WS2 2X0,5 BN
-SS0
-K1
-V1
-X0G2
29
0
00
10
A2
PULSANTE IMPUGNATURA
HANDLE PUSH BUTTON
AVVIO MOTORE LAMA
BLADE MOTOR START
MACCHINA PRONTA
STAND BY MACHINE
4.2
4.2
4.2


=QgCv - -AL
=QgCv - -XQG2
=QgCv - -XQGFU
MORSETTIERA FUSIBILI
TERMINAL FUSES
N
00 - 0
19
31
5
N
30
34
30
12
-F3
-F2
-F1
Dis. N. TI352
CAD SPAC
File TI352\1
Data 25/01/2008
Impianto
TIGER 352
Denominazione
MORSETTIERA
TERMINAL STRIP
Ordine
Commessa
Esecutore Bartoli
FOGLIO 7
ULTIMO 14
REV.
MODIFCA
DATA
FIRME


-NM1
NUMERAZIONE FILI
WIRE NUMERATION
-NM2
NUMERAZIONE MORSETTI
TERMINAL NUMERATION
-FS1
FASCETTA 135x2,5
CLAMP 135x2,5
-SF1
SACCHETTO PORTAFUSIBILI
BAG FUSE
-TF1
TARGA SOSTITUZIONE FUSIBILI
PLATE SUBSTITUTION FUSES
-TF2
GUARNIZIONE AERSTOP
SEAL AERSTOP
-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
-CC2
CAPICORDA 2,5mmq
TERMINAL 2,5mmQ
-QD1
QUADRO (CARPENTERIA)
BOARD (CARPENTRY)
-BR1
BARRA OMEGA 350mm
OMEGA RAIL 350mm
-S4
-V1
-S50
-F3
-F2
-F1
-K0
-K1
-Q0
-T1
REV.
MODIFICA
DATA
FIRME
Dis. N. TI352
CAD SPAC
File TI352\1
Data 25/01/2008
Impianto
TIGER 352
Denominazione
INTERNO QUADRO
BOARD INSIDE
Ordine
Commessa
Esecutore
Bartoli
FOGLIO 8
ULTIMO 14


LATO QUADRO
PANEL SIDE
-GH1
PG13,5
-RE2
PG13,5/Ø18
-CR1
Ø18 x 3000 mm
-RE1
PG13,5/Ø18
-RD1
M32 / PG13,5
FILI MOTORE LAMA
WIRE SAW MOTOR
-GH2
PG7
-PC1
PG7
-W52: CAVO PULSANTE IMPUGNATURA
-W52: HANDLE PUSH BUTTON CABLE
-GH3
PG7
-PC2
PG13,5
-W4: CAVO MOTORE POMPA
-W4: MOTOR PUMP CABLE
-GH4
PG13,5
-PC3
PG13,5
-W1: CAVO ALIMENTAZIONE
-W1: POWER SUPPLY CABLE
REV.
MODIFCA
DATA
FIRME
Dis. N. TI352
CAD SPAC
File TI352\1
Data 25/01/2008
Impianto
TIGER 352
Denominazione
GUAINE E ACCESSORI
SHEATHS AND ACCESSORIES
Ordine
Commessa
Esecutore Bartoli
FOGLIO 9
ULTIMO 14


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 -AL 3/1 L1 BN -W1 022.0158 5G1.5 3,00 BN L1 5 3/3 =QgCv -Q0
=QgCv -AL 3/1 L2 BK Cavo alimentazione BK L2 3 3/3 =QgCv -Q0
=QgCv -AL 3/1 N BU BU N N 3/2 =QgCv -AL
=QgCv -AL 3/1 L3 GY GY L3 1 3/3 =QgCv -Q0
=QgCv -AL 3/2 PE GNYE GNYE PE PE 3/2 =QgCv -AL
=QgCv -XQGFU 4/7 -F3 34 BN -W4 022.1904 3G0.75 3,50 BN 34 4.00 4/7 =BmMep -M2
=QgCv -K1 4/2 1_2 20 BU Cavo motore pompa BU 20 0 4/7 =BmMep -M2
=QgCv PIASTRA 4/8 7 GNYE GNYE 7 PE 4/8 =BmMep -M2
=QgCv -S50 6/2 A 29 BN -W52 022.0160 2x0.5 3,00 BN 29 1 6/4 =QgCv -S15
=QgCv -XQG2 6/2 D 00 BU Colleg. pulsante impugnatura BU 00 3 6/4 =QgCv -S15
REV.
MODIFICA
DATA
FIRME
Dis. N. TI352
CAD SPAC
File TI352\1
Data 25/01/2008
Impianto
TIGER 352
Denominazione
RIASSUNTIVO CAVI
CABLE SUMMARY
Ordine
Commessa
Esecutore Bartoli
FOGLIO 10
ULTIMO 14

0	1	2	3	4	5	6	7	8	9

NOME/ITEM	TIPO/TYPE	DESCRIZIONE/DESCRIPTION	QUADRO/BOARD	FG/SH	Q.TA/Q.TY
'-RE1	'022.0211	Raccordo rapido dritto SEM PG13,5/Ø19	'=BmCv	9	1
'-RE2		Raccordo rapido dritto SEM PG13,5/Ø19	'=BmCv	9	1
'-PC3	'022.0234	Pressacordone 3246 nero PG13,5	'=BmCv	9	1
'-PC1	'022.0238	Pressacavo PG7 BS01	'=BmCv	9	1
'-PC2		Pressacavo PG7 BS01	'=BmCv	9	1
'-GH1	'022.0244	Dado grigio PG13,5	'=BmCv	9	1
'-GH4		Dado grigio PG13,5	'=BmCv	9	1
'-RD1	'022.0347	Riduzione M/F M32/PG13,5	'=BmCv	9	1
'-CR1	'022.2602	Guaina POLIFLEX NW 14-1200143 (corrugato diam. 18)	'=BmCv	9	3,00
'-GH3	'022.2702	Dado BL01 PG7	'=BmCv	9	1
'-GH2		Dado BL01 PG7	'=BmCv	9	1
'-R6	'043.0206	Raccordo diritto da 1/8"G a Ø4mm	'=BmMaCm	11	1
'-R7		Raccordo diritto da 1/8"G a Ø4mm	'=BmMaCm	11	1
'-R4	'043.0208	Raccordo a gomito da 1/8"G a Ø8mm	'=BmMaCm	11	1
'-R5	'043.0231	Riduzione diritta M/F da 1/8"G	'=BmMaCm	11	1
'-T1	'043.0301	Tubo rilsan 8X6 NERO COD.17257181	'=BmMaCm	11	2,20
'-T2	'043.0302	Tubo rilsan 4X2.7 NERO C.17257162	'=BmMaCm	11	2,00
'-SL2	'043.0473	Silenziatore da 1/8"G in ottone	'=BmMaCm	11	1
'-SL1		Silenziatore da 1/8"G in ottone	'=BmMaCm	11	1
'-V1	'043.0604	Valvola 5/3 comando manuale 358/990 Camozzi	'=BmMaCm	11	1
'-GT2	'022.0180	Guaina termoretraibile 26mm	'=BmMaCp	11	0,15
'-RE5	'022.0211	Raccordo rapido dritto SEM PG13,5/Ø19	'=BmMaCp	11	1
'-GH5	'022.0244	Dado grigio PG13,5	'=BmMaCp	11	1
'-CR1	'022.2602	Guaina POLIFLEX NW 14-1200143 (corrugato diam. 18)	'=BmMaCp	11	0,90
'-R4	'043.0195	Raccordo diritto da 1/4"G a Ø8mm CL1050	'=BmMaCp	11	1
'-R7	'043.0206	Raccordo diritto da 1/8"G a Ø4mm	'=BmMaCp	11	1
'-R8		Raccordo diritto da 1/8"G a Ø4mm	'=BmMaCp	11	1
'-R5	'043.0228	Riduzione M/F da 1/4-1/8"G	'=BmMaCp	11	1
'-R6		Riduzione M/F da 1/4-1/8"G	'=BmMaCp	11	1
'-T3	'043.0301	Tubo rilsan 8X6 NERO COD.17257181	'=BmMaCp	11	2,50
'-T4	'043.0302	Tubo rilsan 4X2.7 NERO C.17257162	'=BmMaCp	11	5,00
'-SL2	'043.0474	Silenziatore da 1/4"G in ottone	'=BmMaCp	11	1
'-SL1		Silenziatore da 1/4"G in ottone	'=BmMaCp	11	1
'-V1	'043.0503	Pedaliera 5/3 354-925 Camozzi	'=BmMaCp	11	1
'-GT1	'022.0181	Guaina termoretraibile 10mm	'=BmMaMep	11	0,90

REV.	MODIFICA	DATA	FIRME

Dis. N. TI352
CAD SPAC
File TI352\1
Data 25/01/2008

Impianto *TIGER 352*
Denominazione DISTINTA MATERIALI
MATERIAL LIST

Ordine
Commessa
Esecutore Bartoli

FOGLIO 12
ULTIMO 14

0	1	2	3	4	5	6	7	8	9

NOME/ITEM	TIPO/TYPE	DESCRIZIONE/DESCRIPTION	QUADRO/BOARD	FG/SH	Q.TA/Q.TY
'-R1	'043.0195	Raccordo diritto da 1/4"G a Ø8mm CL1050	'=BmMaMep	11	1
'-R11	'043.0199	Raccordo a gomito da 1/8"G a Ø4mm	'=BmMaMep	11	1
'-R10		Raccordo a gomito da 1/8"G a Ø4mm	'=BmMaMep	11	1
'-IR1	'043.0290	Innesto rapido ghiotto 1/4"G 13/A	'=BmMaMep	11	1
'-VR1	'043.0601	Valvola VMS 114-1/4 08	'=BmMaMep	11	1
'-M1	'019.1954	Motore KW 2,6/1,84 8/4P. C112 B14 V. 380	'=BmMep	4	1
'-M2	'028.0271	Elettropompa EZ/C monofase SAP SA FH2 230/400V 50/60Hz	'=BmMep	4	1
'-R2	'043.0204	Raccordo a gomito da 1/4"G a Ø8mm	'=PpMaMep	11	1
'-R3		Raccordo a gomito da 1/4"G a Ø8mm	'=PpMaMep	11	1
'-MN1	'043.0552	Manometro Ø40 con attacco assiale da 1/8"G	'=PpMaMep	11	1
'-GTA	'043.0564	Regolatore di pressione da 1/4"G FR042	'=PpMaMep	11	1
'-S15	'010.0928	Molla per impugnatura MEP dis.1189559	'=QgCv	6	1
'-QD1	'016.0705	Quadro comandi TI 300-350 LVD	'=QgCv	8	1
'-FS1	'019.5353	Fascetta in plastica 135x2,5	'=QgCv	8	30
'-FL1	'022.0171	Cordicella unipolare 1 X 0,5	'=QgCv	8	1,45
'-FL2	'022.0172	Cordicella unipolare 1x1,50	'=QgCv	8	25,60
'-NM2	'022.0290	Etichetta per morsettiera	'=QgCv	8	7
'-NM1		Etichetta per morsettiera	'=QgCv	8	90
'-CC2	'022.0296	Terminale a occhiello Ø5 da 2,5mmq (Blu)	'=QgCv	8	1
'-CC1	'022.0308	Terminale a occhiello Ø5 da 1,5mmq (Rosso)	'=QgCv	8	4
'-PT1	'022.0311	Terminale a puntale da 0,5mmq (Bianco)	'=QgCv	8	10
'-PT3	'022.0312	Terminale a puntale da 1,5mmq (Nero)	'=QgCv	8	44
'-T1	'022.0440	Trasformatore 30 + 70VA V.230-400 S0.24 / 0.48 50/60Hz	'=QgCv	5	1
'-S15	'022.0515	Microinteruttore V-21-1C6	'=QgCv	6	1
'-K0	'022.0626	Bobina minima V380-400 50 /440-460 60 EP107.5.UA1-400 ABB	'=QgCv	3	1
'-V1	'022.0862	Scheda mono led 24V Ø8	'=QgCv	6	1
'-BR1	'022.0900	Barra omega	'=QgCv	8	0,20
'-S4	'022.1245	Emergenza M22-PVT cod.263467 + M22-A 216374 + M22-K01 216378	'=QgCv	3	1
'-Q0	'022.1264	Magnetotermico 6,3-10A EP-090 3-MS116-10 ABB	'=QgCv	3	1
'-AL	'022.2256	Morsetto da 2.5 mm singolo per 2 fili a molla 56.703.0055.0	'=QgCv	3	1
'-XQGFU	022.2256 + 022.1136 + 022.1136	Morsetto portafusibile a molla + N° 2 fusibili da 500V 5A	'=QgCv	5	1
'-XQGFU		Morsetto portafusibile a molla + N° 2 fusibili da 500V 5A	'=QgCv	5	1
'-XQGFU		Morsetto portafusibile a molla + N° 2 fusibili da 500V 5A	'=QgCv	4	1
'-XQG2	'022.2257	Morsetto da 2.5 mm singolo per 3 fili a molla 56.703.5055.0	'=QgCv	6	1
'-K1	'022.3002	Contattore DILM9-10 (24 V. 50.60 HZ) cod.276694	'=QgCv	6	1

REV.	MODIFICA	DATA	FIRME

Dis. N. TI352
CAD SPAC
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Data 25/01/2008

Impianto *TIGER 352*
Denominazione DISTINTA MATERIALI / *MATERIAL LIST*

Ordine
Commessa
Esecutore Bartoli

FOGLIO 13
ULTIMO 14

0	1	2	3	4	5	6	7	8	9

NOME/ITEM	TIPO/TYPE	DESCRIZIONE/DESCRIPTION	QUADRO/BOARD	FG/SH	Q.TA/Q.TY
'-S50	'022.3054	Selettore 2 velocita 20A T0-5-70331 GB/E	'=QgCv	4	1
'-TF2	'025.0604	Guarnizione aerstop	'=QgCv	8	2,00
'-S15	'025.0691	Serie guernizioni per impugnatura	'=QgCv	6	1
'-TF1	'031.2622	Targa sostituzione fusibili	'=QgCv	8	1
'-S15	'034.1221	Impugnatura MEP	'=QgCv	6	1
'-SF1	'047.0182	Sacchetto portafusibili	'=QgCv	8	1

Tipo/Type	Formaz./Format.	Descrizione/Description	Lungh./Lenght
022.0158	5G1.5	Cavo 5x1,5mmq	3.00
022.0160	2x0.5	Cavo 2x0.5mmq	3.00
022.1904	3G0.75	Cavo 3x0.75mmq	3.50

REV.	MODIFICA	DATA	FIRME

Dis. N. TI352
CAD SPAC
File TI352\1
Data 25/01/2008

Impianto *TIGER 352*
Denominazione DISTINTA MATERIALI
MATERIAL LIST

Ordine
Commessa
Esecutore Bartoli

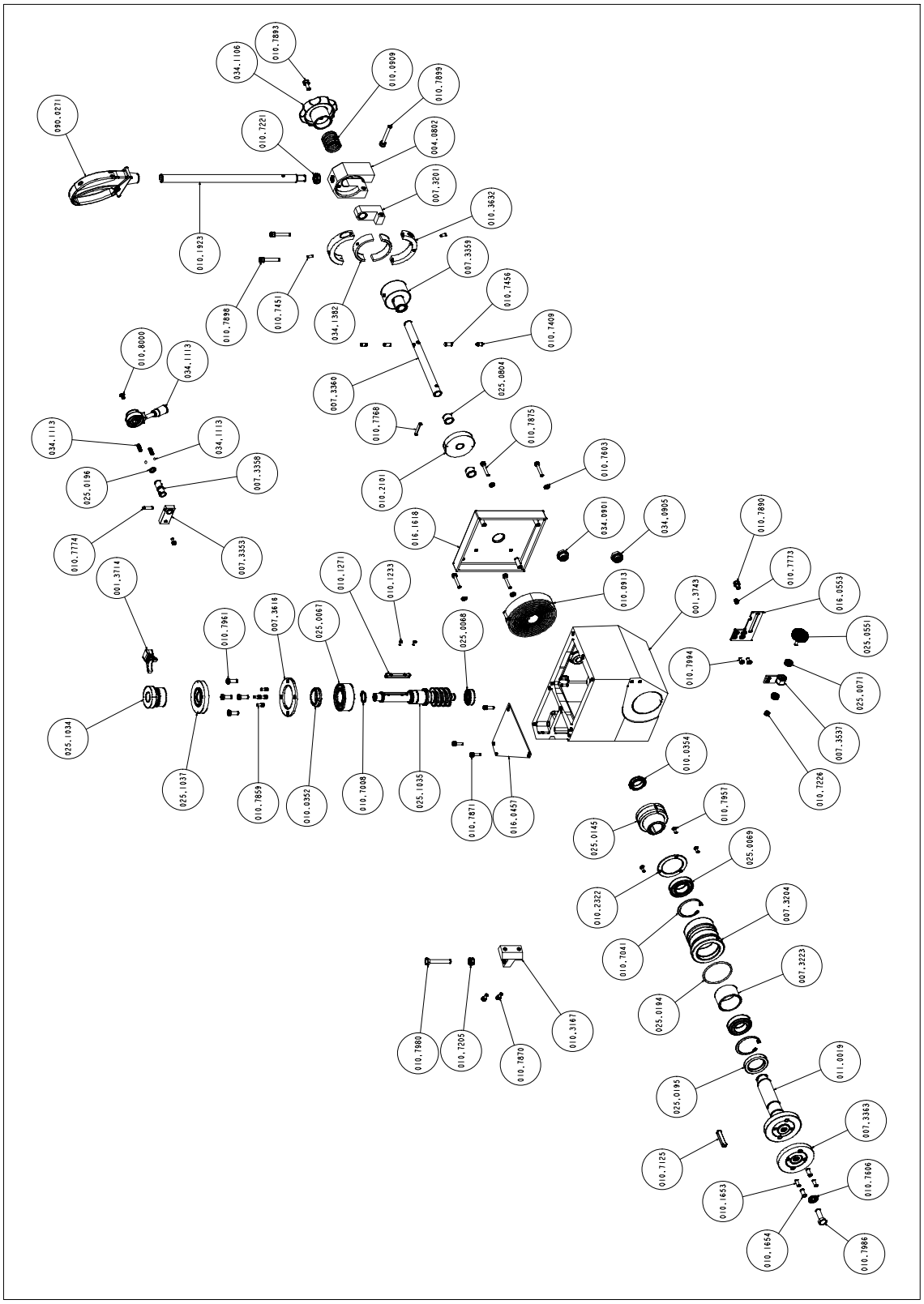
FOGLIO 14
ULTIMO 14

Translation of the original instructions

Exploded views

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

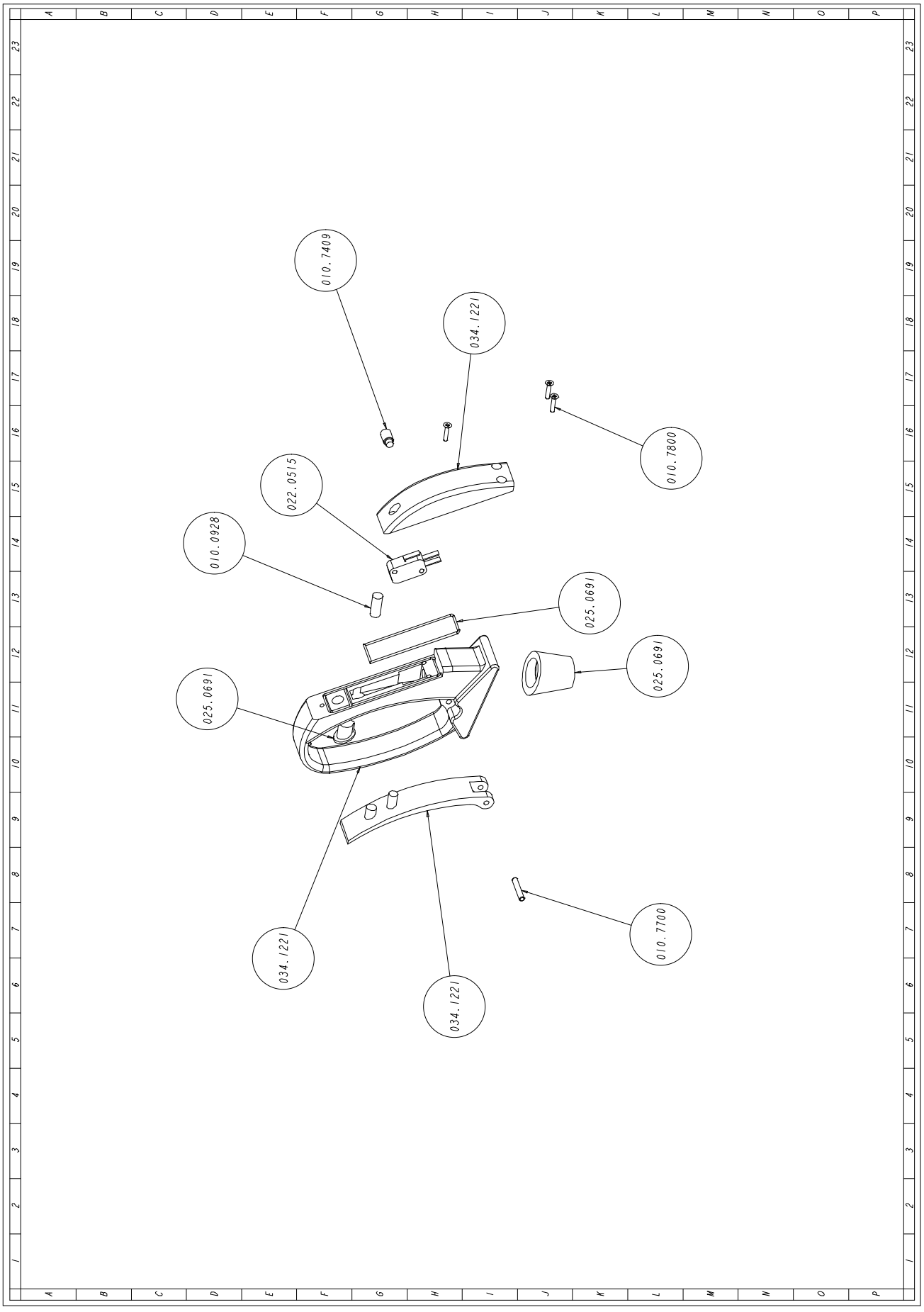
Head unit



Code	Description	U. of M.	Quantity
001.3714	FORCELLA CAMBIO TI 350 MOD.43016	PZ	1.000
001.3743	TESTA OPERATRICE TI 352 GUIDA RULLI	PZ	1.000
004.0802	SUPPORTO LEVA COMANDO TESTA TI M661	PZ	1.000
007.3201	TASSELLO INTERNO X LEVA COMANDO TESTA TI	PZ	1.000
007.3204	TAMPONE CUSCINETTI TI 300−350	PZ	1.000
007.3223	DISTANZIALE CUSCINETTO TI	PZ	1.000
007.3353	PIASTRINO COMANDO CAMBIO TI 350 4V.	PZ	1.000
007.3358	PERNO LEVA CAMBIO TI 350 4 VEL.	PZ	1.000
007.3359	BOCCOLA RIPRESA CORSA TI 350	PZ	1.000
007.3360	ALBERO MOVIMENTO TESTA TI 350	PZ	1.000
007.3363	FLANGIA ESTERNA TI 350 − 370	PZ	1.000
007.3537	PIASTRINO PULILAMA TI	PZ	1.000
007.3616	GHIERA FISSAGGIO CUSCINETTO CN−TI 350 −SH 280320	PZ	1.000
010.0352	GHIERA AUTOBLOCCANTE 35X1,5 CN−TI− SH−FC	PZ	1.000
010.0354	GHIERA AUTOBLOCCANTE 30X1,5 CN 275 TI 350−PH 261	PZ	1.000
010.0909	MOLLA RICHIAMO IMPUGNATURA TI	PZ	1.000
010.0913	MOLLA SOLLEVAMENTO TESTA TI350/352 TI370	PZ	1.000
010.1233	VITE PER LINGUETTA TI 352	PZ	1.000
010.1271	LINGUETTA 8X7X70 FORATA TI 350−SX−. AX−CNC N.T.	PZ	1.000
010.1653	PERNO FLANGIA 0 7 X 22	PZ	2.000
010.1654	PERNO FLANGIA 0 9 X 19	PZ	2.000
010.1923	LEVA COMANDO TESTA TI 352	PZ	1.000
010.2101	RUOTA SOLLEVAMENTO TESTA TI 350	PZ	1.000
010.2322	FLANGIA BLOCCAGGIO CUSCINETTI TI 300−350	PZ	1.000
010.3167	BATTUTA FINE CORSA TESTA IN BASSO TI 352−SX−AX−CNC	PZ	1.000
010.3632	RALLA FRIZIONE FISSA TI 352 NEW	PZ	1.000
010.7008	ANELLO SEEGER 0 25	PZ	1.000
010.7041	ANELLO SEEGER PER FORI 0 65	PZ	2.000
010.7125	CHIAVETTA 10 X 8 X 56	PZ	1.000
010.7205	DADO M10	PZ	1.000
010.7221	DADO M16 BASSO	PZ	1.000
010.7226	DADO AUTOBLOCCANTE M6	PZ	1.000
010.7409	GRANO VCE PUNTA CILINDRICA 8 X 10	PZ	2.000
010.7451	GRANO VCE PUNTA CONICA 6 X 12	PZ	1.000
010.7456	GRANO VCE PUNTA CONICA 8 X 16 (010.7456)	PZ	1.000
010.7603	RONDELLA 0 6	PZ	4.000
010.7606	RONDELLA 0 12	PZ	1.000
010.7768	SPINA ELASTICA DIAM. 6 X 40	PZ	1.000
010.7773	SPINA ELASTICA DIAM. 8 X 10	PZ	1.000
010.7774	SPINA ELASTICA DIAM. 6 X 26	PZ	1.000
010.7859	VITE TCEI 5 X 12	PZ	5.000
010.7870	VITE TCEI 6 X 16	PZ	1.000
010.7871	VITE TCEI 6 X 20	PZ	1.000
010.7875	VITE TCEI 6 X 40	PZ	4.000
010.7890	VITE TCEI 8 X 12	PZ	1.000
010.7893	VITE TCEI 8 X 20 (010.7893)	PZ	1.000
010.7898	VITE TCEI 8 X 45	PZ	2.000
010.7899	VITE TCEI 8 X 60	PZ	1.000
010.7957	VITE TE 5 X 12	PZ	3.000
010.7961	VITE TE 8 X 20	PZ	4.000
010.7980	VITE TE 10 X 60	PZ	1.000
010.7986	VITE TE 12 X 35	PZ	1.000
010.7994	VITE TSPEI 6 X 12	PZ	2.000
010.8000	VITE TSPEI 6 X 8	PZ	1.000
011.0019	ALBERO PORTADISCO TI 352 CEMENTATO FLANGIA O 100	PZ	1.000
016.0457	COPERCHIO TESTA TI 350 4 VEL.	PZ	1.000
016.0553	GUIDA SPAZZOLA PULILAMA TI	PZ	1.000
016.1618	COPERCHIO MOLLA RICH.TESTA TI 352	PZ	1.000
025.0067	CUSCINETTO 3207	PZ	1.000
025.0068	CUSCINETTO 6203	PZ	1.000
025.0069	CUSCINETTO 32007X	PZ	2.000
025.0071	CUSCINETTO 626 2RS	PZ	2.000
025.0145	CORONA ELICOIDALE TI350 D.86.06.002	PZ	1.000
025.0194	ANELLO DI TENUTA OR 176 G VITON	PZ	1.000
025.0195	ANELLO DI TENUTA 45X62X10 G VITON	PZ	1.000
025.0196	ANELLO DI TENUTA OR 3043 G VITON	PZ	1.000
025.0551	SPAZZOLA PULILAMA 6 X 25 030 GG43 TI−SH200	PZ	1.000
025.0804	BOCCOLA GRAFITATA 20X23X15	PZ	2.000
025.1034	RUOTA DENTATA 43007/53 ALBERO VITE SENZAFINE TI 350−SX−AX−CNC	PZ	1.000
025.1035	ALBERO VITE SENZA FINE 43003/53 TI 350−SX−AX−CNC N.T.	PZ	1.000
025.1037	RUOTA DENTATA 43005/53 ALBERO VITE SENZAFINE TI 352	PZ	1.000

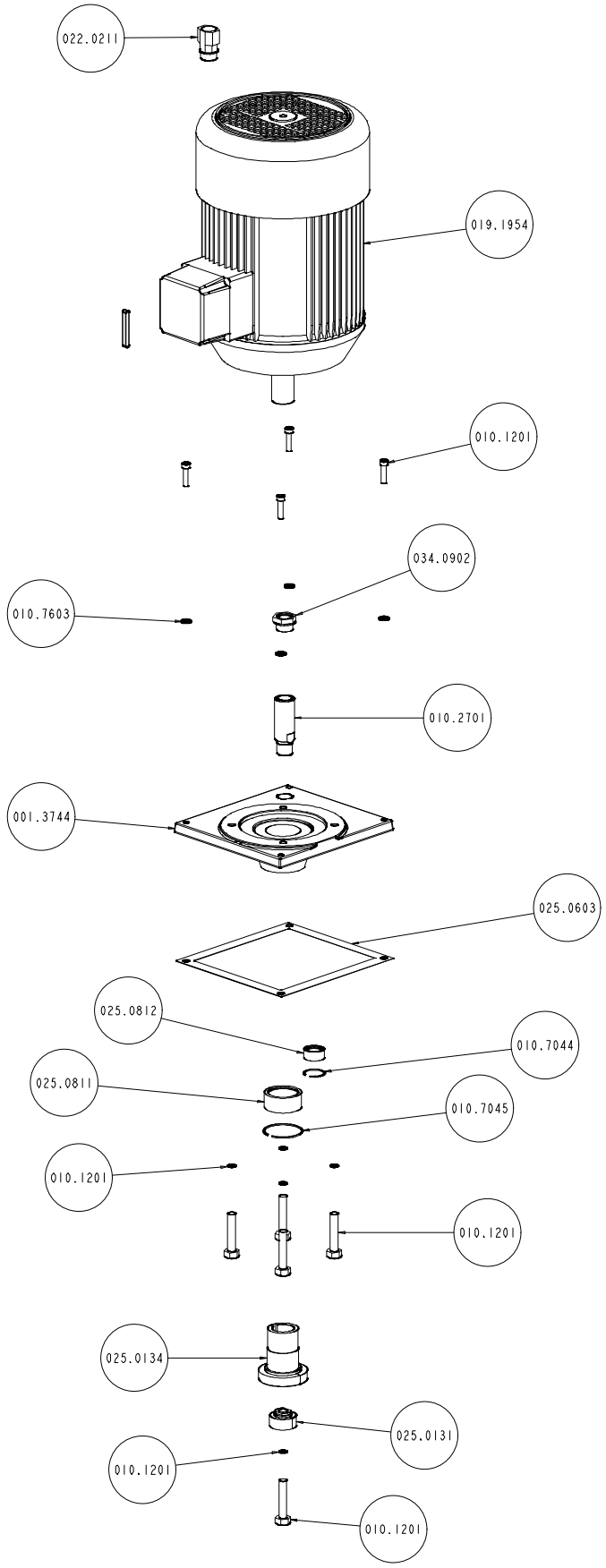
Code	Description	U. of M.	Quantity
034.0901	TAPPO LIVELLO OLIO 1/2 'GAS.	PZ	1.000
034.0905	TAPPO OLIO TAO/3 1/2' NERO	PZ	1.000
034.1106	VOLANTINO O 100 A 6 LOBI TIGER	PZ	1.000
034.1113	VOLANTINO DI MANOVRA X TI350 4 VEL.	PZ	3.000
034.1382	SEMIANELLO DI FRIZIONE TI 352 NEW	PZ	1.000
090.0271	IMPUGNATURA COMPLETA TIPO MEP	PZ	1.000

Headgrip


010.7409
034.1221
010.7800
022.0515
010.0928
025.0691
025.0691
025.0691
034.1221
034.1221
010.7700

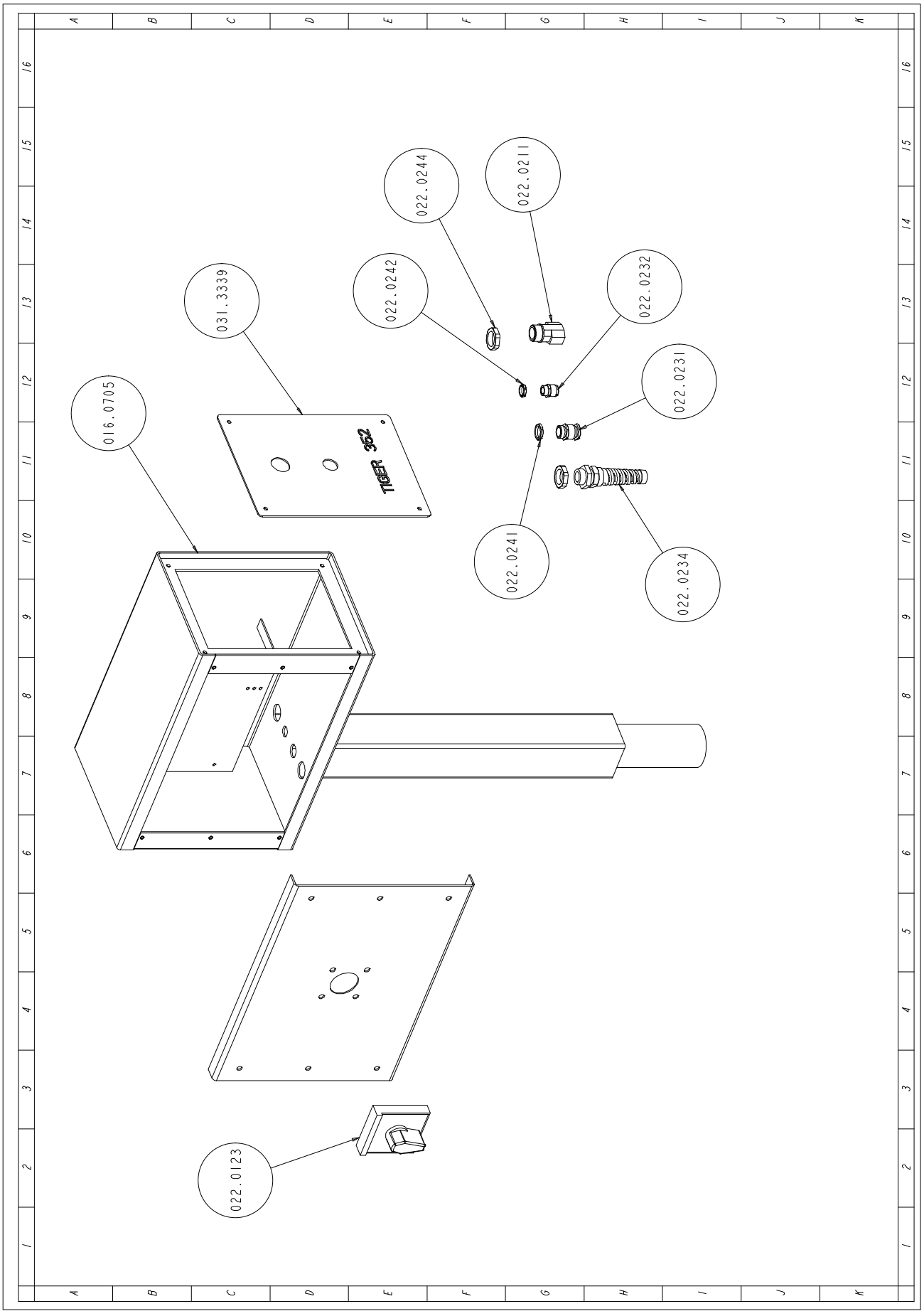
Code	Description	U. of M.	Quantity
010.0928	MOLLA X IMPUGNATURA	NR	1,000
010.7409	GRANO VCE P.CIL. 8 X 10	NR	1,000
010.7700	SPINA CILINDRICA DIAM. 4 X 24	NR	1,000
010.7800	VITE AUTOFIL. 2,9 X 15	NR	3,000
022.0515	MICROINTERRUTTORE V−21−1C6	NR	1,000
025.0691	SERIE GUARNIZIONI X IMPUGNATURA MEP	NR	1,000
034.1221	IMPUGNATURA DIS. MEP	NR	1,000

Motor assembly



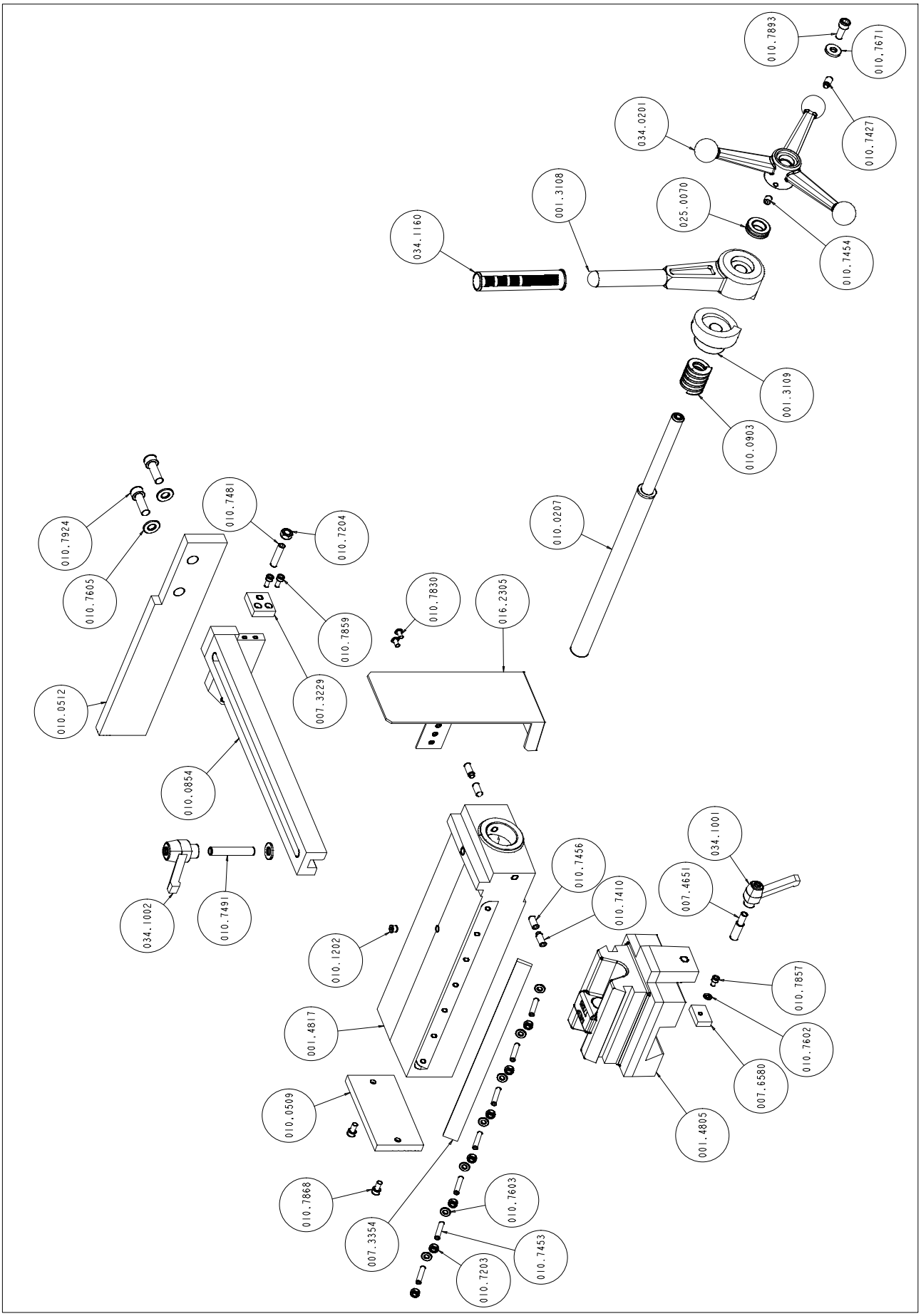
Code	Description	U. of M.	Quantity
001.3744	COPERCHIO SUPER.TESTA TI 352 GUIDA RULLI	NR	1,000
010.1201	VITERIA E BULLONERIA	NR	5,000
010.2701	PROLUNGA TAPPO OLIO TI 350	NR	1,000
010.7044	ANELLO SEEGER PER FORI 0 26	NR	1,000
010.7045	ANELLO SEEGER PER FORI 0 48	NR	1,000
010.7603	RONDELLA DIAM. 6	NR	4,000
019.1954	KW 2,6/1,84 8/4P.C112 B.14 V.3	NR	1,000
022.0211	RACCORDO RAPIDO SEM PG 13,5	NR	1,000
025.0131	RUOTA DENTATA 43004/53 ALB. MO	NR	1,000
025.0134	RUOTA DENTATA 43006/53 ALB.MOT	NR	1,000
025.0603	GUARNIZIONE TESTA 4 VEL.	NR	1,000
025.0811	BOCCOLA A RULLINI DHK 4020 HK	NR	1,000
025.0812	BOCCOLA A RULLINI DHK 2012 HK	NR	1,000
034.0902	TAPPO OLIO SFP 1/2” ROSSO	NR	1,000

Control panel



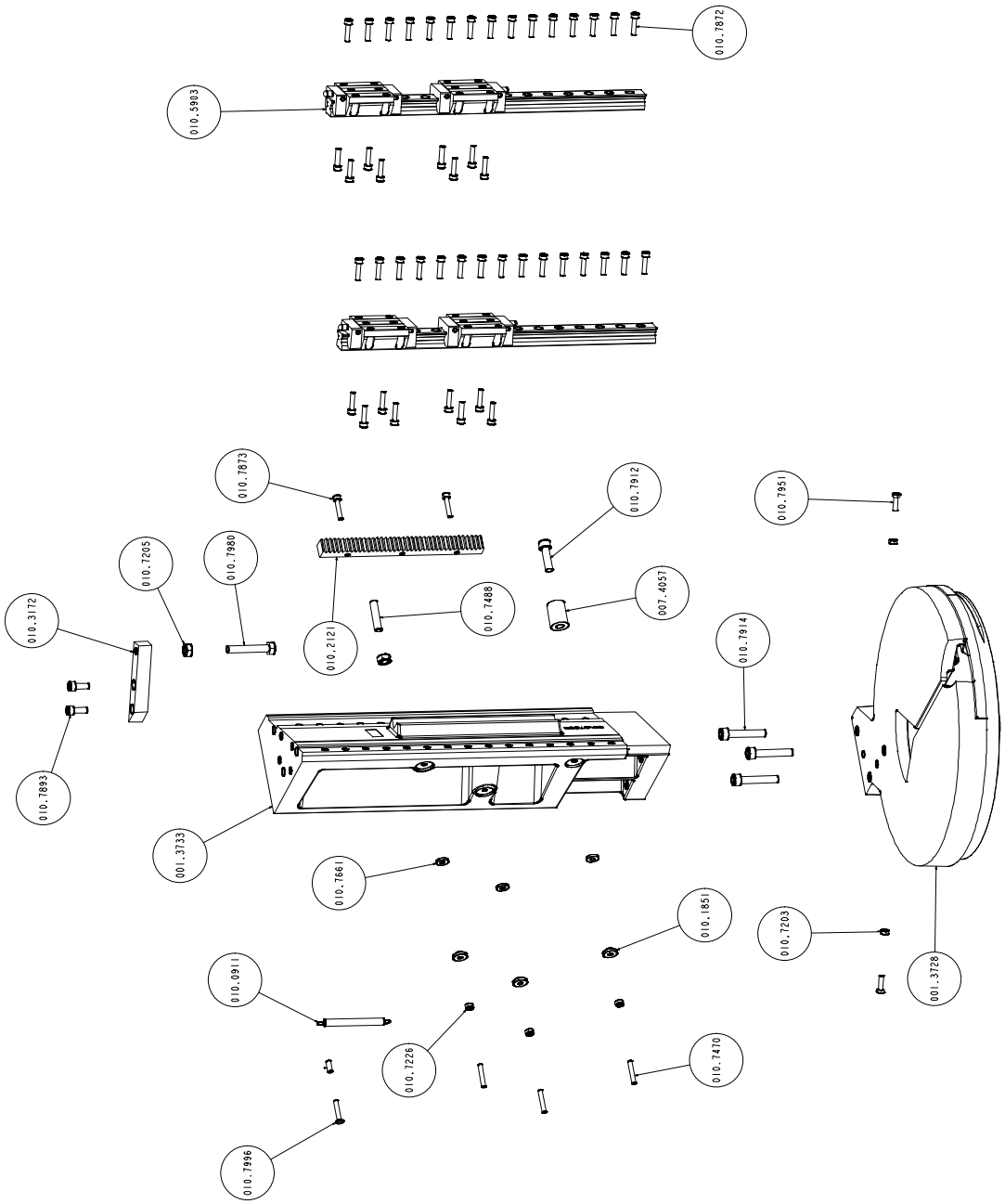
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016.0705	QUADRO COMANDI LVD	NR	1,000
022.0123	COMANDO BLOCCOPORTA LUCCHETTAB	NR	1,000
022.0211	RACCORDO RAPIDO SEM PG 13,5	NR	1,000
022.0231	PRESSACAVO IN OTTONE 3/8 BM 24	NR	1,000
022.0232	PRESSACAVO IN OTTONE 1/4 BM 24	NR	1,000
022.0234	PRESSACORDONE 3246 NERO PG 13,	NR	1,000
022.0241	DADO IN OTTONE BM 2461 3/8	NR	1,000
022.0242	DADO IN OTTONE BM 2460 1/4	NR	1,000
022.0244	CONTRODADO 3217B GRIGIO PG 13	NR	2,000
031.3339	TARGA INTERRUTTORE TI 352	NR	1,000

Vice


010.7893
010.7671
034.0201
010.7427
001.3108
025.0070
034.1160
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001.3109
010.0903
010.0207
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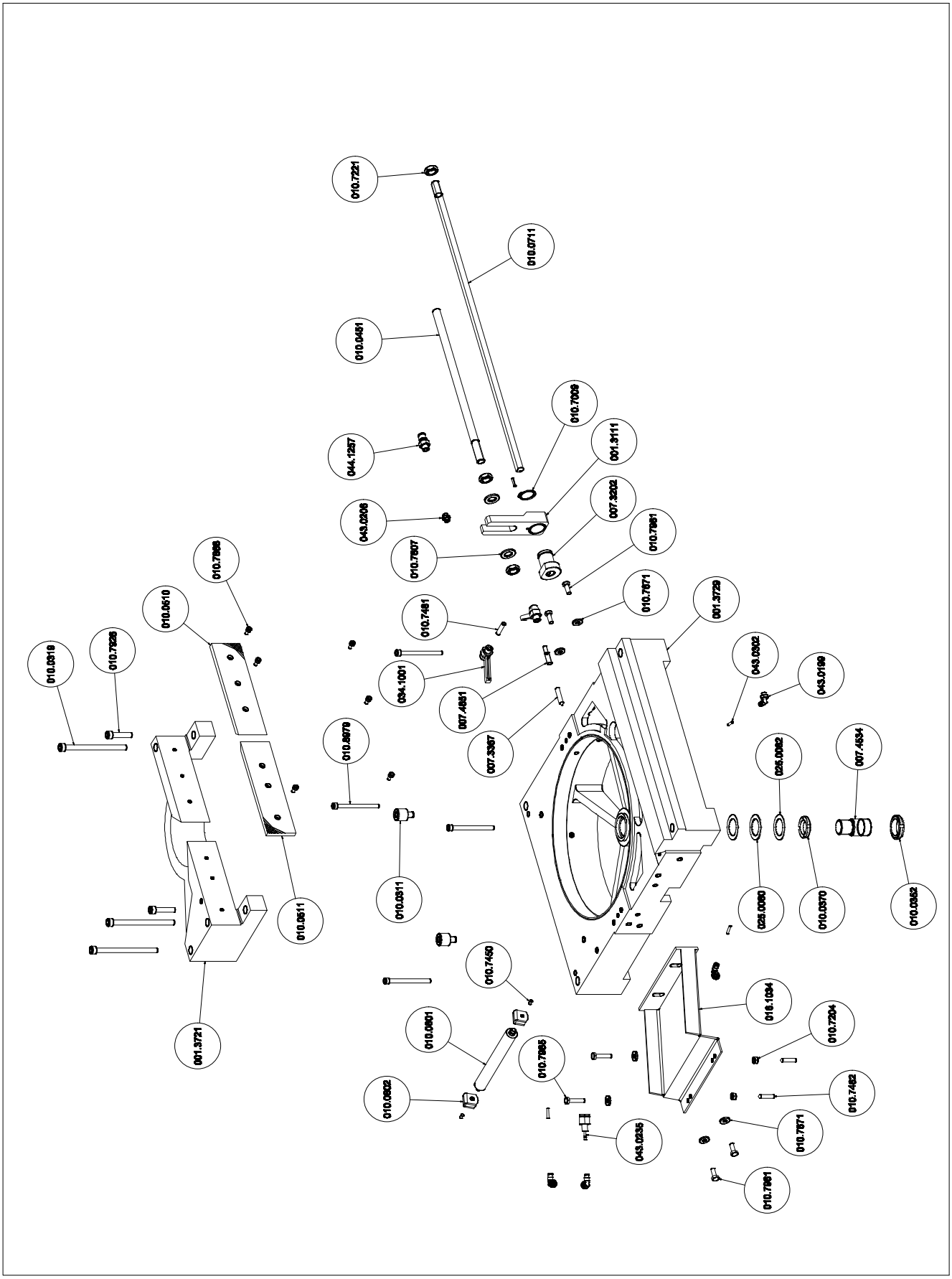
Code	Description	U. of M.	Quantity
001.3108	LEVA BLOCCAGGIO MORSA RAPIDA	NR	1,000
001.3109	BOCCOLA A CAMME	NR	1,000
001.4805	SUPPORTO MORSA M	NR	1,000
001.4817	.SCORREVOLE MORSA TI 370 SX	NR	1,000
007.3229	TASSELLO X BATTUTA SCORR. ANTI	NR	1,000
007.3354	LARDONE MORSA	NR	1,000
007.4651	GRANO BLOCCAGGIO PIANO ROTANTE	NR	1,000
010.0207	VITE MORSA	NR	1,000
010.0509	GANASCIA MORSA	NR	1,000
010.0512	GANASCIA ANTIBAVA	NR	1,000
010.0854	SUPPORTO SCORREVOLE GANASCIA A	NR	1,000
010.0903	MOLLA MORSA RAPIDA	NR	1,000
010.1202	OLIATORE A SFERA DIAM. 8	NR	1,000
010.7203	DADO M6	NR	7,000
010.7204	DADO M8	NR	1,000
010.7410	GRANO VCE P.CIL. 8 X 16	NR	2,000
010.7427	GRANO VCE P.CIL. 8 X 12	NR	1,000
010.7453	GRANO VCE P.CON. 6 X 30	NR	7,000
010.7454	GRANO VCE P.CON. 8 X 8	NR	1,000
010.7456	GRANO VCE P.CON. 8 X 16	NR	2,000
010.7481	GRANO VCE PUNTA PIANA 8 X 35	NR	1,000
010.7491	GRANO VCE PUNTA PIANA 10 X 60	NR	1,000
010.7603	RONDELLA DIAM. 6	NR	7,000
010.7602	RONDELLA 0 5	NR	1,000
010.7671	RONDELLA SPESSORE DIAM. 8 X 3	NR	1,000
010.7605	RONDELLA DIAM. 10	NR	3,000
010.7830	VITE BUTON 5 X 10	NR	1,000
010.7857	VITE TCEI 5 X 8	NR	1,000
010.7859	VITE TCEI 5 X 12	NR	2,000
010.7868	VITE TCEI 6 X 12	NR	2,000
010.7893	VITE TCEI 8 X 20	NR	3,000
010.7924	VITE TCEI 10 X 30	NR	2,000
010.9074	GRANO VCE PUNTA PIANA 10 X 20	NR	1,000
016.2305	RACCOGLITORE ACQUA MORSA TI 352 − MA−SX−AX−CNC	NR	1,000
025.0070	CUSCINETTO 51103	NR	1,000
034.0201	VOLANTINO MORSA GRANDE	NR	1,000
034.1001	LEVA A SCATTO 8 MA	NR	1,000
034.1002	LEVA A SCATTO 10 MA	NR	1,000
034.1160	MANOPOLA MOD. 1014 0 20	NR	1,000

Tourntable


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010.7470
010.7936

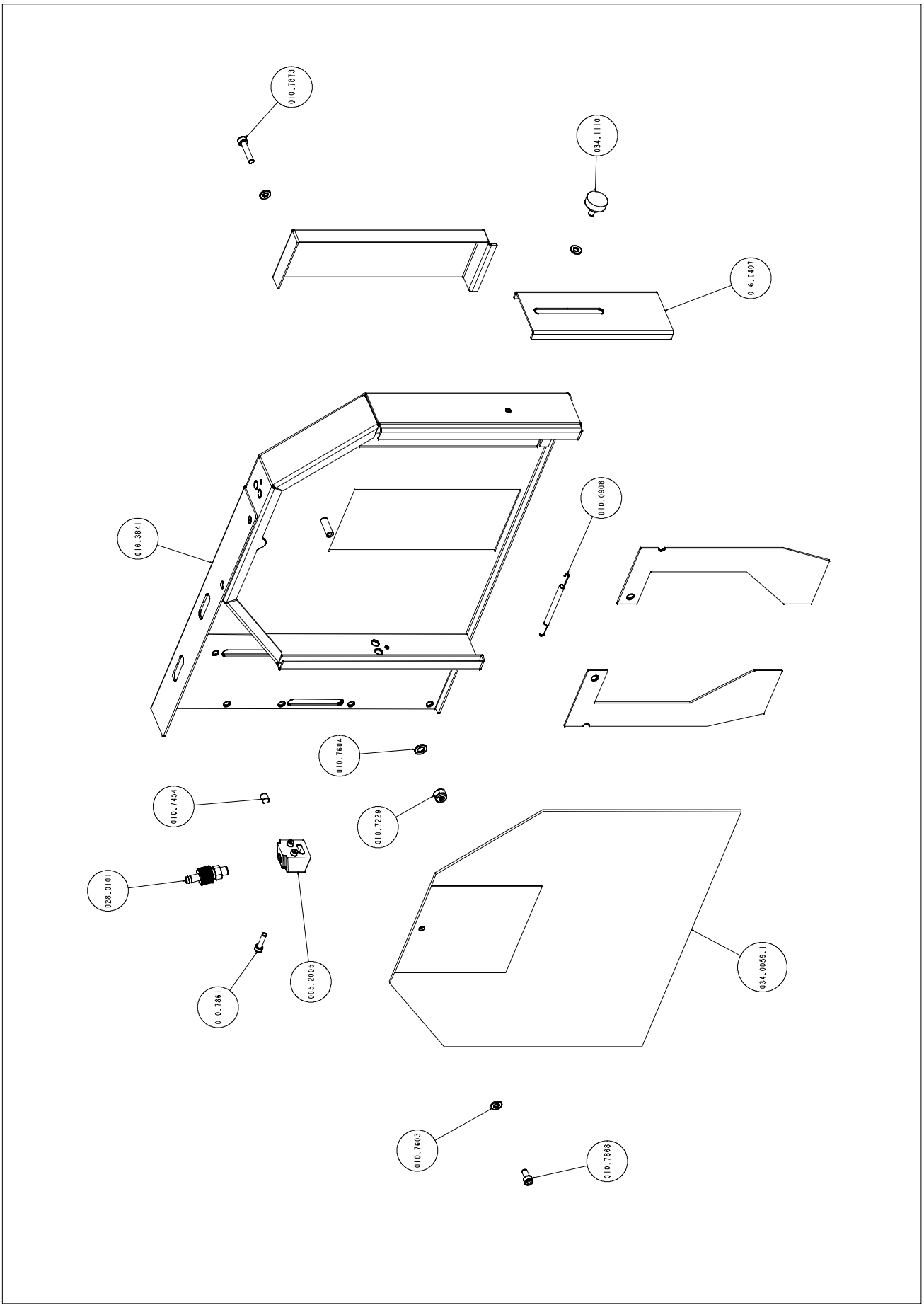
Code	Description	U. of M.	Quantity
001.3728	PIATTAFORMA GIREVOLE TI 352 N.T.	PZ	1.000
001.3733	COLONNA PORTANTE TI 352 GUIDA RULLI	PZ	1.000
007.4057	BOCCOLA BATTUTA FINECORSA TI MA−SX− AXSH 260−282	PZ	1.000
010.0911	MOLLA RICHIAMO CARTER DISCO TI SX−AX	PZ	1.000
010.1851	BOCCOLA PER CARTER DISCO TI O 20	PZ	3.000
010.2121	CREMAGLIERA TI 300−350	PZ	1.000
010.3172	BATTUTA MECCANICA TESTA IN ALTOTIGER 352	PZ	1.000
010.5903	GUIDA + 2 PATTINI SRG25C2SSC1+460LH−E20	PZ	1.000
010.7203	DADO M6	PZ	2.000
010.7205	DADO M10	PZ	1.000
010.7226	DADO AUTOBLOCCANTE M6	PZ	3.000
010.7470	GRANO VCE PUNTA PIANA 6 X 35	PZ	3.000
010.7488	GRANO VCE PUNTA PIANA 10 X 45	PZ	1.000
010.7661	RONDELLA SPESSORE DIAM. 6 X 3	PZ	3.000
010.7872	VITE TCEI 6 X 25	PZ	1.000
010.7873	VITE TCEI 6 X 30	PZ	2.000
010.7893	VITE TCEI 8 X 20	PZ	1.000
010.7912	VITE TCEI 10 X 35	PZ	1.000
010.7914	VITE TCEI 10 X 55	PZ	3.000
010.7951	VITE TE 6 X 20	PZ	2.000
010.7980	VITE TE 10 X 60	PZ	1.000
010.7996	VITE TSPEI 6 X 30	PZ	1.000

Fix plattform assembly



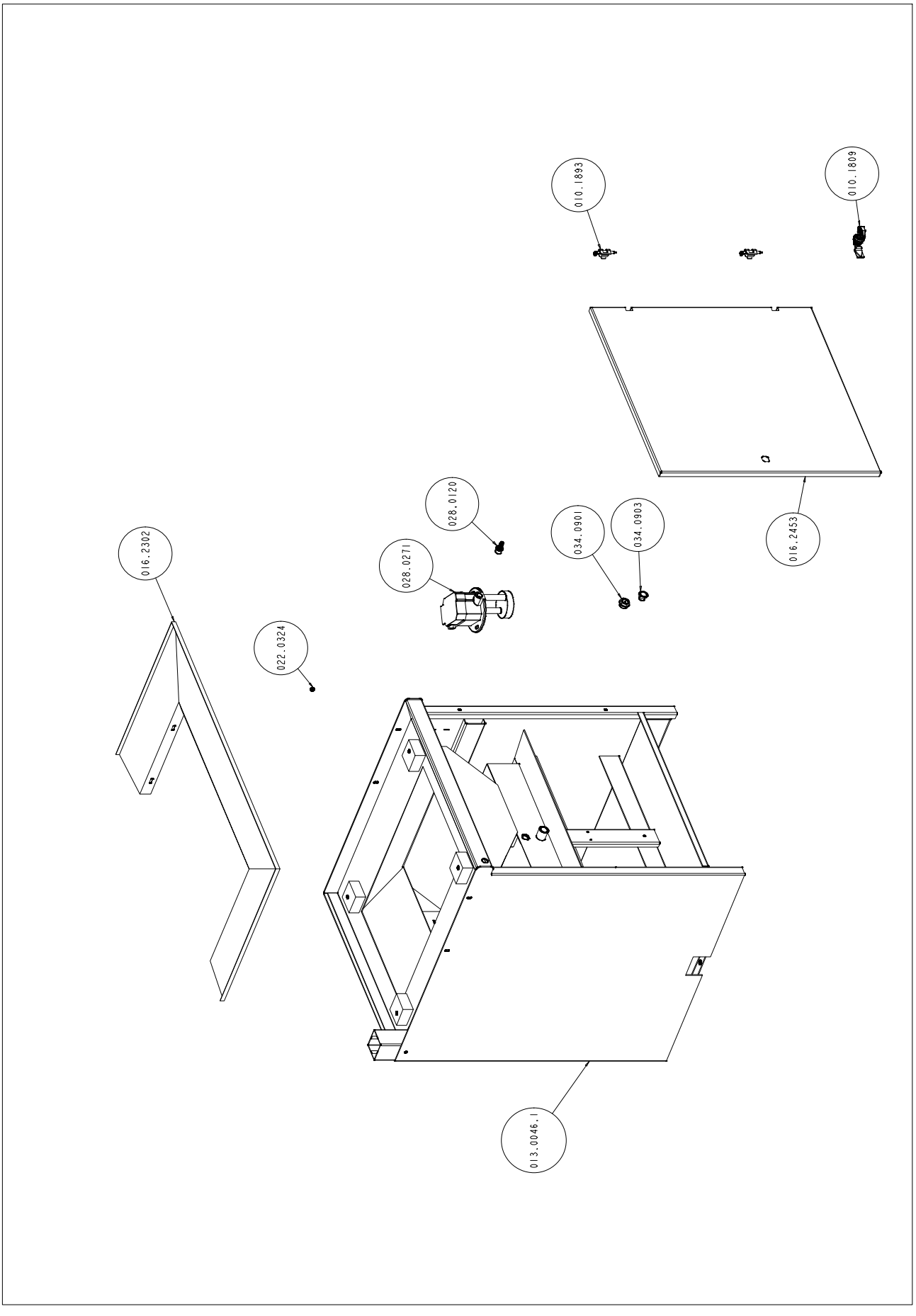
Code	Description	U. of M.	Quantity
001.3111	DISTANZIALE BATTUTA	NR	1,000
001.3721	SQUADRO MORSA TI 350−352	NR	1,000
001.3729	PIATTAFORMA FISSA	NR	1,000
007.3202	BOCCOLA X BATTUTA	NR	1,000
007.3367	PERNO BLOCCAGGIO PIANO GIREVOL	NR	1,000
007.4534	PERNO DI CENTRO	NR	1,000
007.4651	GRANO BLOCCAGGIO PIANO ROTANTE	NR	1,000
010.0311	VITE TCEI M12X16 BATT.PIANO GI	NR	2,000
010.0319	VITE 8.8 TCEI 10X140 TI	NR	1,000
010.0352	GHIERA AUTOBLOCCANTE 35X1,5	NR	1,000
010.0370	GHIERA 5S 30X1,5	NR	1,000
010.0451	TIRANTE BATTUTA TAGLI MISURA	NR	1,000
010.0510	GANASCIA MORSA DESTRA TI 350 − SINISTRA	NR	1,000
010.0511	GANASCIA MORSA SINISTRA TI 350	NR	1,000
010.0711	ASTA MILLIM.CROMATA MM.600 FIL	NR	1,000
010.0801	RULLO TIPO	NR	1,000
010.0802	SUPPORTO PER RULLO	NR	2,000
010.7009	ANELLO SEEGER DIAM. 30	NR	1,000
010.7204	DADO M8	NR	2,000
010.7221	DADO M16 BASSO	NR	2,000
010.7450	GRANO VCE P.CIL. 6 X 6	NR	2,000
010.7462	GRANO VCE P.CON. 8 X 30	NR	2,000
010.7481	GRANO VCE PUNTA PIANA 8 X 35	NR	1,000
010.7607	RONDELLA DIAM. 16	NR	2,000
010.7671	RONDELLA SPESSORE DIAM. 8 X 3	NR	6,000
010.7868	VITE TCEI 6 X 12	NR	1,000
010.7926	VITE TCEI 10 X 45	NR	1,000
010.7961	VITE TE 8 X 20	NR	4,000
010.7965	VITE TE 8 X 35	NR	2,000
010.8979	VITE TCEI 8 X 95	NR	4,000
016.1034	BRACCETTO APPOGGIA BARRA	NR	1,000
025.0080	GABBIA ASSIALE A RULLINI AXK 3	NR	1,000
025.0082	RALLA AS 3552	NR	2,000
034.1001	LEVA A SCATTO 8 MA PK55	NR	2,000
043.0199	ATTACCO A GOMITO GIREVOLE 4X1/8 CL 6521	NR	1,000
043.0206	ATTACCO A ESAGONO 4X1/8 − CL 6511	NR	1,000
043.0235	BIFORCAZ. A Y TUBO 4MM. 24275320	NR	1,000
043.0302	TUBO RILSAN 4X2.7 NERO C.17257162	NR	1,000
044.1257	VALVOLA CARICO CILINDRO TI−CB CNC	NR	1,000

Blade guard unit



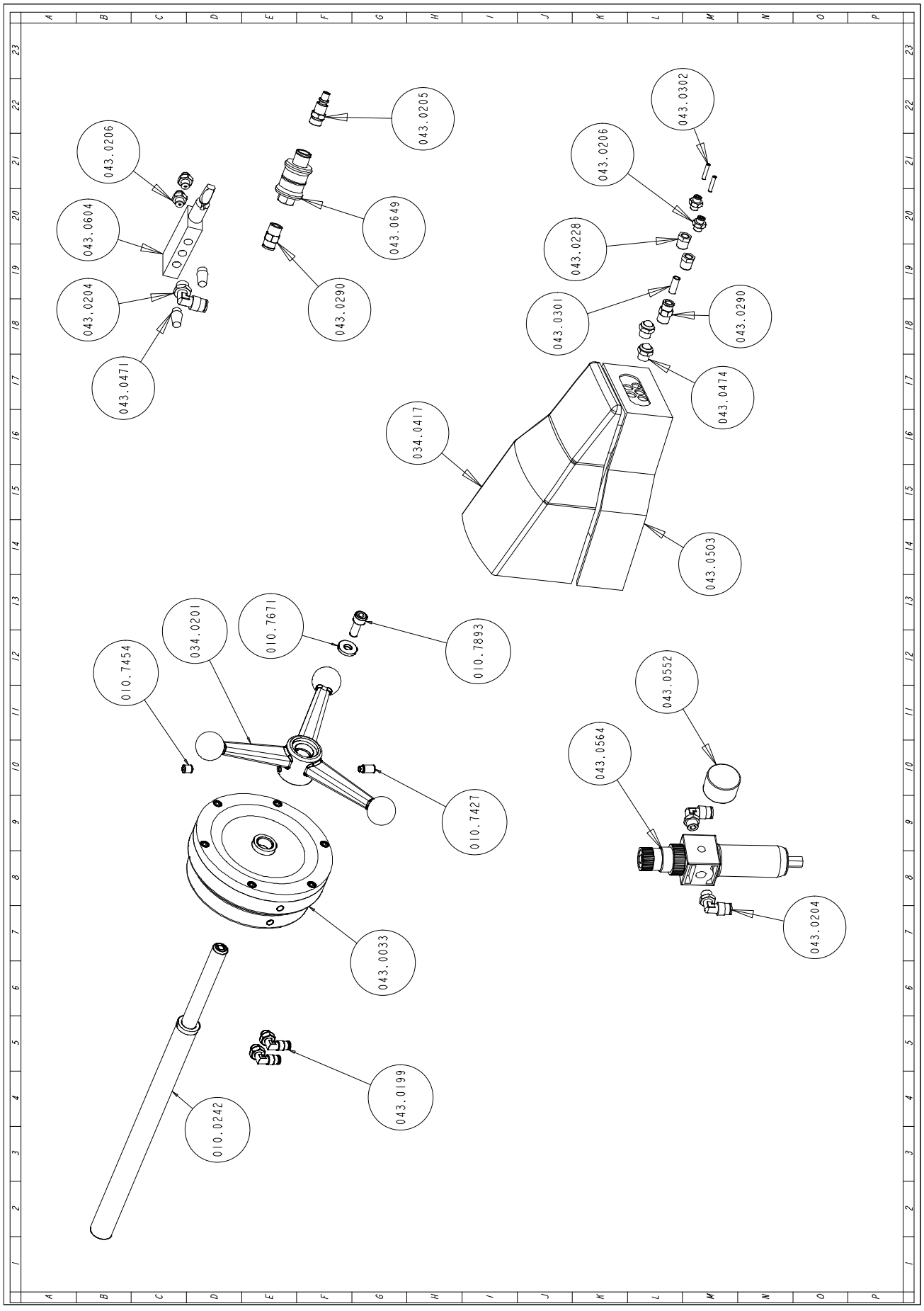
Code	Description	U. of M.	Quantity
005.2005	SPRUZZATORE RUBINETTO	NR	1,000
010.0908	MOLLA CARTER DISCO	NR	1,000
010.7229	DADO AUTOBLOCCANTE M8	NR	1,000
010.7454	GRANO VCE P.CON. 8 X 8	NR	1,000
010.7603	RONDELLA DIAM. 6	NR	3,000
010.7604	RONDELLA DIAM. 8	NR	1,000
010.7861	VITE TCEI 5 X 20	NR	1,000
010.7868	VITE TCEI 6 X 12	NR	1,000
010.7873	VITE TCEI 6 X 30	NR	1,000
016.0407	PARASCHIZZI ANTERIORE	NR	1,000
016.3841	CARTER DISCO TI 352 - SX EVO	NR	1,000
028.0101	REGOLATORE PER RUBINETTO 8 X 1	NR	1,000
034.0059.1	PROTEZIONE LEXAN TI 352+ADESIVO SCELTA	NR	1,000
034.1110	VOLANTINO DIAM.30 M6 X 10	NR	1,000

Base vice


010.1893
010.1809
016.2453
028.0120
028.0271
034.0901
034.0903
016.2302
022.0324
013.0046.1

Code	Description	U. of M.	Quantity
010.1809	CHIUSURA SPORTELLO	NR	1,000
010.1893	CERNIERA SPORTELLO PIEDISTALLO N.T.	NR	1,000
013.0046.1	PIEDISTALLO TI 352 − 352 MA − 352 SX EVO	NR	1,000
016.2302	RACCOGLITORE ACQUA TI 352 − SX	NR	1,000
016.2453	SPORTELLO PIED. TI 352 − MA − SX EVO	NR	1,000
022.0324	PASSACAVI 24 INC.MM.2.5	NR	1,000
028.0120	RACCORDO 3/8 − 9 CL 2601	NR	1,000
028.0271	ELETTROPOMPA EZ/C V. 220−380	NR	1,000
034.0901	TAPPO LIVELLO OLIO 1/2 ”GAS.	NR	1,000
034.0903	TAPPI OLIO 3/8” GAS	NR	1,000

Supplementary pneumatic vice



Code	Description	U. of M.	Quantity
010.0242	VITE MORSA	NR.	1,000
010.7427	GRANO VCE PUNTA CILINDRICA 8 X 12	NR.	1,000
010.7454	GRANO VCE PUNTA CONICA 8 X 8	NR.	1,000
010.7671	RONDELLA SPESSORE DIAM. 8 X 3	NR.	1,000
010.7893	M8X20−TCEI	NR.	1,000
034.0201	VOLANTINO−MORSA−125	NR.	1,000
034.0417	COPERCHIO−PED−MA	NR.	1,000
043.0033	CIL−PN−D100	NR.	1,000
043.0199	ATTACCO A GOMITO GIREVOLE 4X1/8 CL 6521	NR.	1,000
043.0204	ATTACCO−A−GOMITO−8X1_4−CL6521	NR.	3,000
043.0205	INNESTO−RAPIDO−1−4GHIOTTO13_A	NR.	1,000
043.0206	ATTACCO−A−ESAGONO−4X1_8CL6511	NR.	6,000
043.0228	RIDUZIONE−4−1_4	NR.	2,000
043.0290	ATTACCO−ESAGONO−8X1_4CL6510	NR.	2,000
043.0301	TUBO−RILSAN−8X6	NR.	1,000
043.0302	TUBO−RILSAN−4X2_7	NR.	4,000
043.0471	SILENZIATORE−WS8N−1_8	NR.	2,000
043.0474	SILENZIATORE−IN−OTTONE−1_4	NR.	2,000
043.0503	PEDALIERA−5VIE−354−925	NR.	1,000
043.0552	MANOMETRO−DIAM40	NR.	1,000
043.0564	FR1_4−20−08	NR.	1,000
043.0649	VALVOLA A CORSOIO LUCCHETTABILE 1/4	NR.	1,000
043.0604	VALVOLA−358−990	NR.	1,000

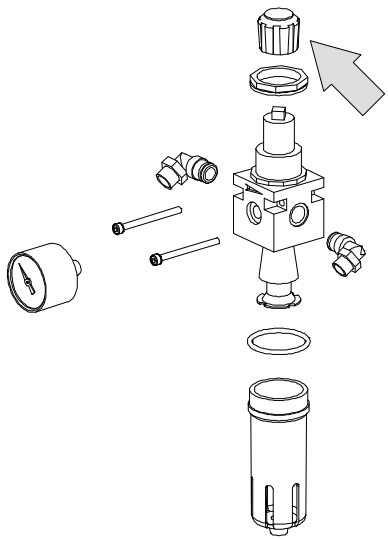
Adjustments



This chapter describes the operations needed to adjust the mechanical and pneumatic (MA version) systems enabling the **TIGER 352** to be used properly. These instructions will enable you to ”customise” your machine to suit the type of cuts being carried out, optimising the time required to complete them.

Air treatment system (MA version)

On the MA version of the **TIGER 352**, the machine’s pneumatic circuit moves the cutting vice using a pneumatic cylinder. The compressed air is treated and purified at the inlet to the system by an air treatment unit. This unit stabilises the pressure at 6 Bar, irrespective of the pressure in the factory circuit.
Nevertheless, the pressure can be preset if the material in the vice is deformed or not clamped properly during the cutting cycle. The mobile jaw of the vice must be positioned manually at 2 ÷ 3 mm from the workpiece before final clamping. This version of the machine requires the user to provide a compressed air system complying with the characteristics reported on chapter 4.
The diagram below shows an exploded view of the air treatment unit: rotating the arrowed knob alters the working pressure of the vice which is displayed by the pressure gauge.



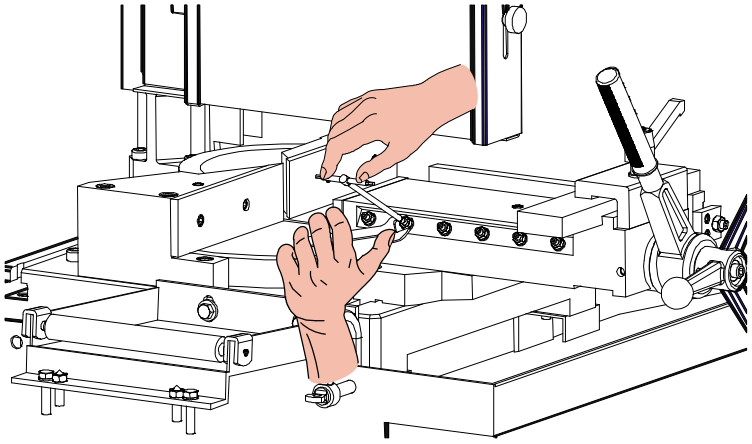
Vice

The vice, fitted as standard on the **TIGER 352**, is equipped with a rag prevention device, adjustable transverse positioning, a three−spoke opening/closing handwheel and rapid clamping device.
Below we shall look at these units in turn.

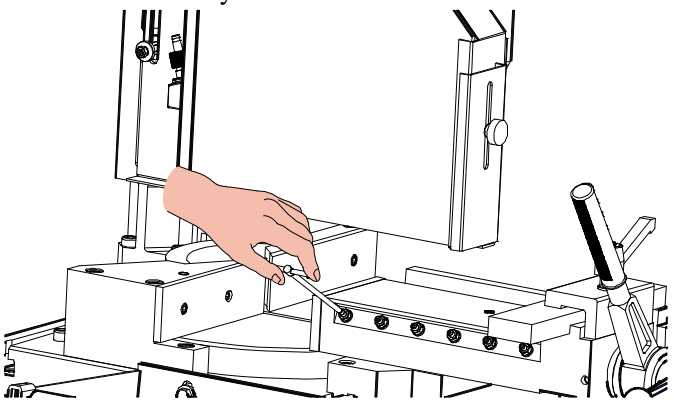
Adjusting the vice play

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

- ▶ slacken all the locknuts on the grub screws in the slide, holding the screws still using an Allen key.
- ▶ move the vice to its fully open position.



- ▶ adjust the slight pressure exerted by the grub screws on the gib, starting with the first two in contact with the lead screw.
- ▶ adjust these two grub screws and tighten the relative lock nuts, keeping the screws still with an Allen key.



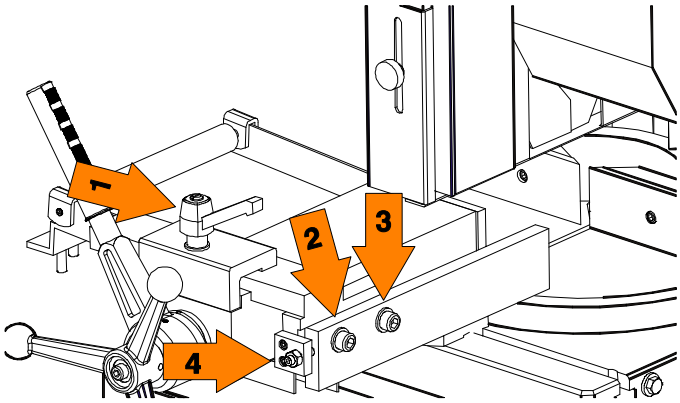
- ▶ close the vice until the other two grub screws coincide with the lead screw.
- ▶ repeat this adjustment on the gib grub screws for the entire length of the slideway
- ▶ at the end of the operation, use the handwheel to move the slide backwards and forwards, identifying the zones where the grub screws exert greater pressure on the gib.
- ▶ repeat the adjustments if necessary.

Rag prevention device

The vice is fitted as standard with a rag prevention device that serves to support the material and prevent the formation of ragged edges at the end of the cut.
To adjust the rag prevention device transversely:

- ▶ loosen the release lever (1) located above the vice slide;

- movement the rag prevention device arm to the right or left;
- tighten the release lever.



To adjust the longitudinal position of the vice jaw, proceed as follows:

- tighten the cutting vice completely;
- slacken the two screws located to the side of the rag prevention device (2−3);
- slacken the nut that locks the grub screw;
- adjust the longitudinal position of the rag prevention vice jaw by slackening or tightening the grub screw (4) until the position of the rag prevention jaw is aligned with that of the cutting jaw;
- hold the grub screw steady using the Allen key and tighten the locking nut.

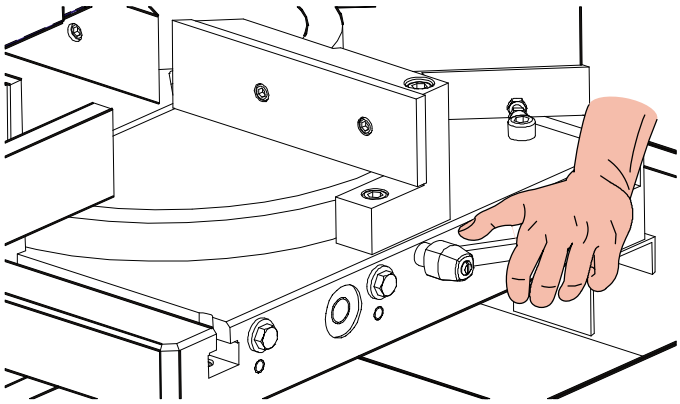
Disc

The HSS cutting discs can be used for any kind of cut since they combine good levels of toughness and elasticity thanks to various coatings, along with a good cutting resistance. The discs are made of a single piece of Tungsten−Molybdenum super−rapid steel with a hardness of about 64±1 HRC. A special characteristic of the discs during cutting is the excellent finish of the cut surfaces.

Adjusting the turntable stops

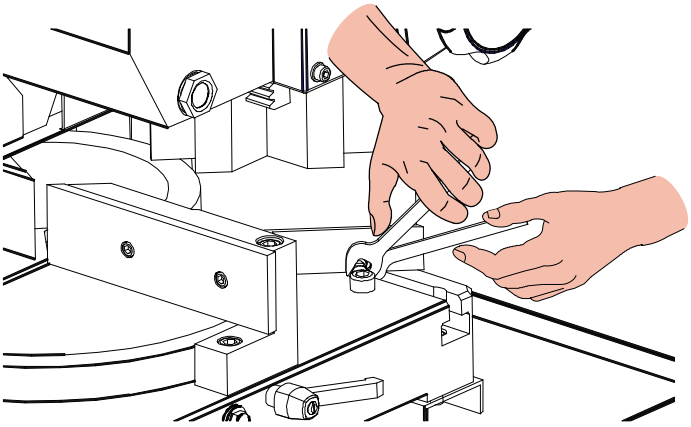
If it found that a cut at 0°, 45° or 60° does not correspond exactly to the angle shown on the turntable, the right and left stops will need adjusting. The procedures for correcting and adjusting the disc stops at 0°, 45° and 60° right and left are described below. Sequence of operations for 0° stop:

- release the turntable by means of the release lever on the right hand side of the table;



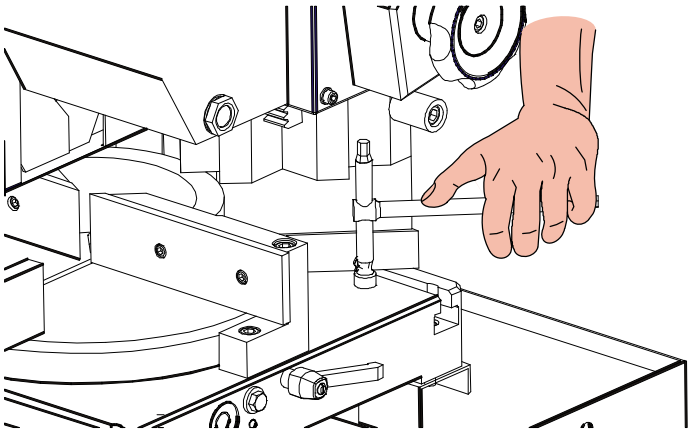
- adjust the nut using two 10 mm spanners until the stop corresponds to the 0° notch; loosen the lock nut and adjust; tighten the lock nut while holding the

bolt steady; check and repeat if necessary.



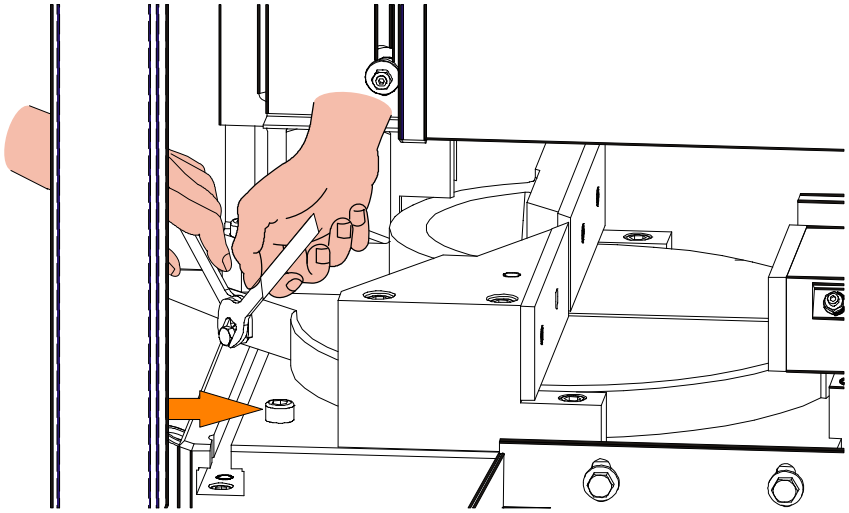
Sequence of operations for 45° right stop:

- ▶ release the turntable by means of the release lever on the right hand side of the table;
- ▶ remove the screw that functions as the 0° stop so as to reach the 45° right position;



- ▶ adjust the nut using two 10 mm spanners until the stop corresponds to the 45° notch; loosen the lock nut and adjust;

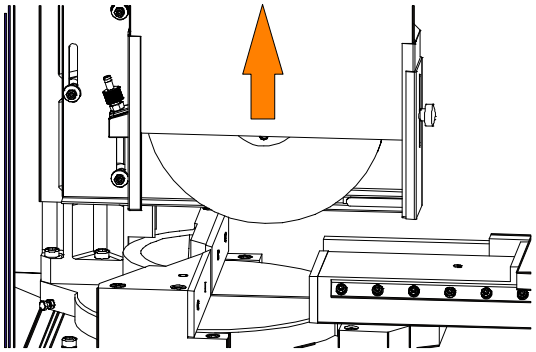
To adjust the 45° and 60° left stops, proceed as for the other positions, but remove the 45° stop screw (shown by the arrow in the photo) to reach the 60° left stop, in the same way as for the 45° right stop described above.



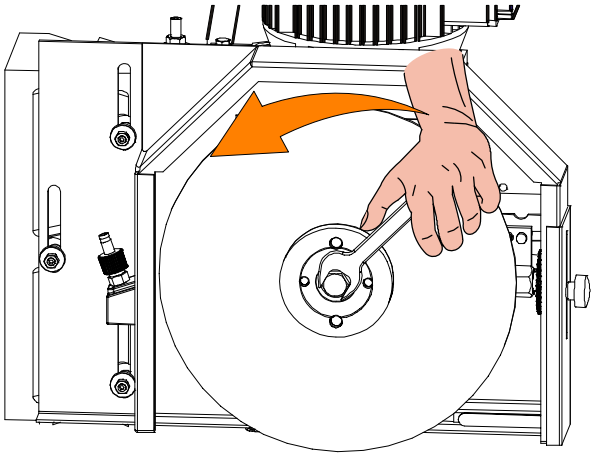
Changing the blade

As we have already said, this machine uses different kinds of blades according to the material to be cut. The procedures described below, however, also apply in the event of wear or breakage of the blade. To replace the blade, proceed as follows:

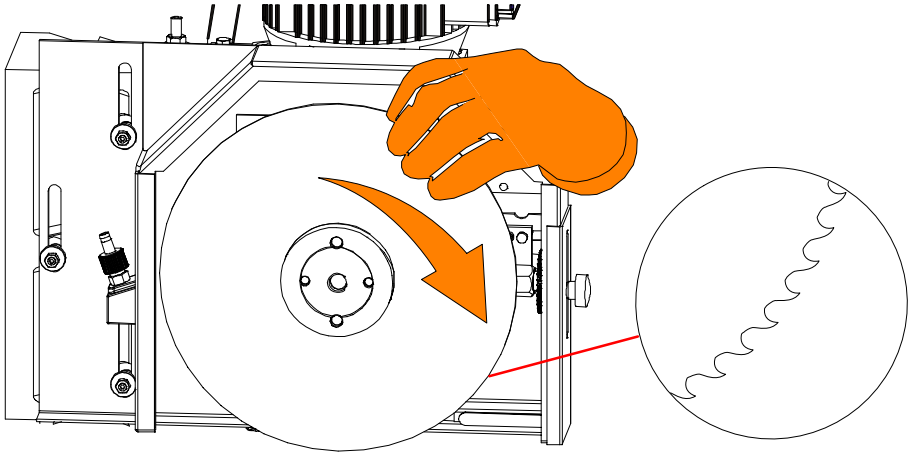
- switch off the machine and position the head so that the disc is easily accessible;
- remove the screw with knob to free the plexiglass guard cover and lift it off in a vertical direction;



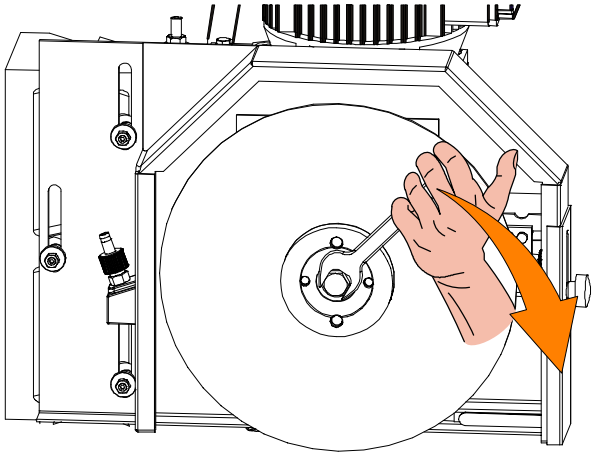
- use a 19 mm spanner to slacken the hexagonal screw that locks the disc, turning the spanner in the direction of rotation of the disc; remove the old disc and insert the new one, making sure that the centering pins fit correctly into the holes in the disc;



Attention Make sure that the teeth on the cutter blade are facing in the direction of rotation. When changing the tool, turn the cutter blade until drive is engaged to eliminate any backlash in the drive pins.



▶ Tighten the lock nut and refit all guards and any other components you may have removed to facilitate installation.

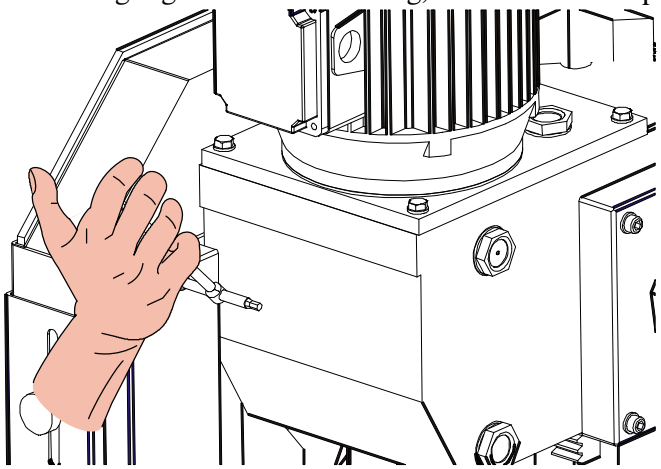


N.B. Adjust the position of the blade−cleaning brush, or replace it when worn.

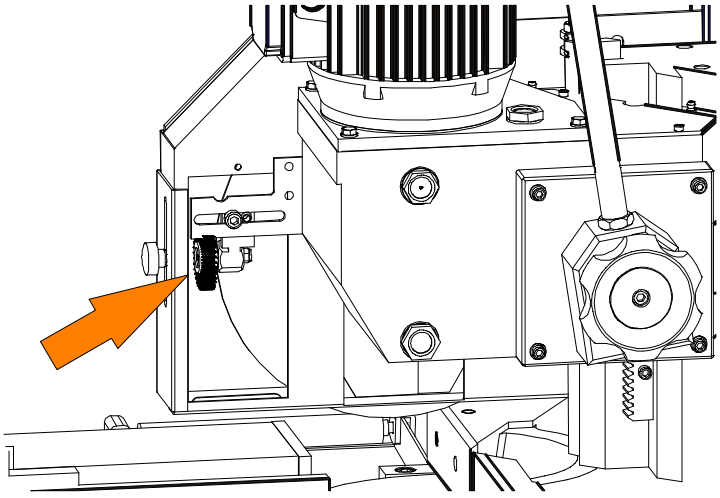
Adjusting the position of the blade−cleaning brush

When the cutter disk is not clean enough, check the blade−cleaning brush for wear and if it's working correctly. The figure below illustrates how the brush should be adjusted if need be.

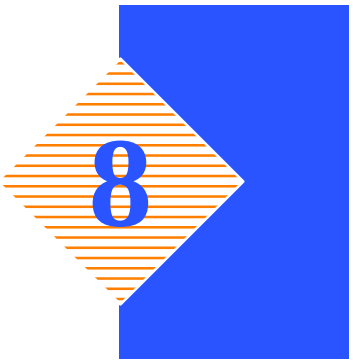
▶ Loosen the screw highlighted in the drawing, and remove the protection;



▶ adjust the position of the blade in relation to the teeth, as shown;



Maintenance and choice of consumables



TIGER 352 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 routine and extraordinary maintenance operations must be carried out with the power disconnection device open and the power plug disconnected from the power socket.
- 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 (Do not use compressed air or fluffy rags);
- ▶ empty the swarf drawer (the swarf collection drawer is located in the base and is accessible through the front opening panel);
- ▶ top up the lubricant/coolant fluid level;



- ▶ check the wear of the blade and change if necessary;
- ▶ check the blade cleaning brush, clean it and reposition it: if worn, replace.

Weekly

The weekly maintenance operations are as follows:

- ▶ remove all swarf from the machine;
- ▶ clean the vice and lubricate all the joints and sliding surfaces using a good quality oil;
- ▶ check the oil level in the transmission box; if necessary fill through cap.
- ▶ check the vice sliding mechanism. If it is not smooth or is subject to side play, adjust as described in chapter 7.

Monthly

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

- check that the machine performs cuts perpendicular to the work surface; if not, contact our technical service centre;
- check that the blade is at right angles to the workpiece rest shoulder; if not, contact our technical service centre;
- check that the 0 degree notch on the fixed work table is in line with the graduation on the turntable. If not, adjust as described in chapter 7;
- check the precision of the 45° right and 45° and 60° left stops; if they are not adjusted correctly, proceed as described in chapter 7;
- clean thoroughly the water tank and the electric pump filter.

Maintenance of working parts

During maintenance work on the **TIGER 352**, special attention should be paid to operating units such as the transmission box.

Transmission box

Transmission box maintenance:

- after the first 1000 working hours, drain the transmission box through the drain plug located in the rear lower section of the unit and refill with new oil. If, in addition to the yellow filings from the bronze rim, there are other impurities in the drained oil, remove the cover and thoroughly wash the inside. The washing should be carried out using flushing oil, avoiding the use of cotton or threadbare rags for drying. Refill the transmission box;
- after every 2000 working hours repeat the oil change operation.

Consumable materials

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

Oils for transmission box

The type of oil the machine works with is CASTROL OPTIGEAR SYNTHETIC PD 150 ES.
Transmission box:
– capacity lt. 4,8

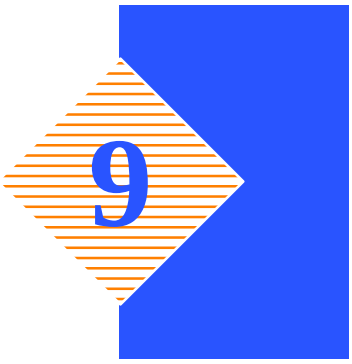
Oils for lubrication/coolant liquid

The oil used for the lubrication/coolant fluid in the machine is BLASER VASCO 6000.
Coolant tank:
– tank capacity 15 litres
– oil concentration 5–6%

Oils for spray mist system (optional)

The used oil type for the optional spray mist system is ILC NATUR 707 EP.
– tank capacity Lt. 1

Cutting speed and choice of tools



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

Cutting speed

TIGER 352 standard machine

The basic machine version, with 4/8 pole motor, is capable of the following cutting speeds:

- 1st speed = 15 rpm
- 2nd speed = 30 rpm
- 3rd speed = 45 rpm
- 4th speed = 90 rpm

TIGER 352 optional

The optional machine version, with 2/4 pole motor, is capable of the following cutting speeds:

- 1st speed = 30 rpm
- 2nd speed = 60 rpm
- 3rd speed = 90 rpm
- 4th speed = 180 rpm

Choice of blade

The different types of cutter disks that the **TIGER 352** can mount must, however, have the following main characteristics.

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

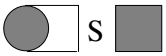
Tooth pitch

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

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

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

Choice of tooth pitch T as a function of cross−section to be cut for light alloy solid pieces and profiles

			
S in mm.	Pitch T	S and sp in mm.	Pitch T
10	4−5	10 sp = 0,5	3
30	6−8	30 sp = 1,5	4 − 5
50	8−10	50 sp = 2,5	5 − 6
70	10−12	70 sp = 3,5	6−7
90	12	90 sp = 4,5	7 − 8
130	16	130 sp = 6,5	8

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

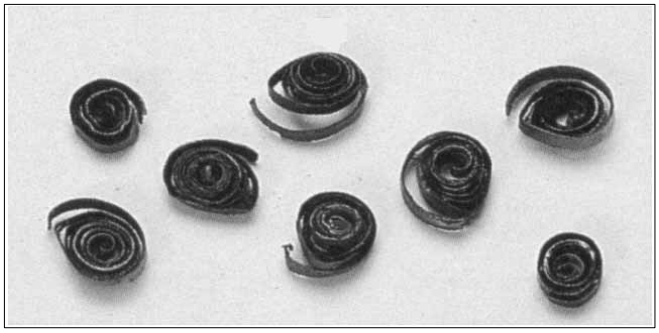
A larger pitch should be chosen when, as a result of the shape of the piece to be cut, the cross−section at any given point exceeds the average cross−section given above.

Types of swarf:

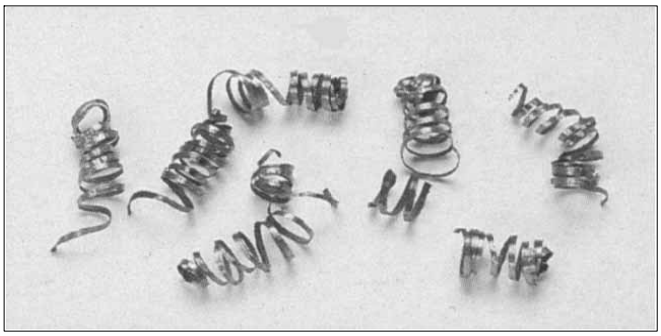
- Very fine or fragmented swarf indicates that the downstroke speed and/or cutting pressure is too low.



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



- Long coils of swarf indicate ideal cutting conditions.



Cutting and feeding speed

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

Lubricant/coolant

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

Blade structure

The circular blades most frequently used for cutting−off machines are HSS−DMo5/M2 consisting of a single piece and characterised by a high level of toughness and a good cutting resistance.

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

TYPE OF BLADE	C	Cr	W	Mo	V	Co	HRC
HSS−DMO 5/M2	0,47	1,00	6,37	1,00	0,12		45−50

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

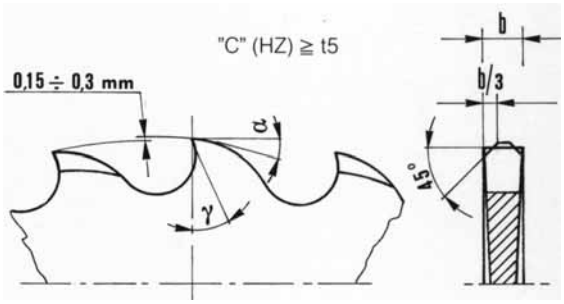
Types of blades

The blades fitted on the **TIGER 352** have dimensions 350x32x2,5 and are made of HSS DMO5 since the machine is intended for cutting ferrous materials. In addition to the size and pitch of the teeth, the blades also have other geometric characteristics according to their particular use:

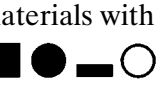
- tooth sharpening, which in this case may be BW with alternate raked tooth or C with roughing tooth raked on both sides and non−raked finishing tooth;
- tooth pitch, the distance between the crests of two subsequent teeth (tooth pitch = T).

Tooth shape

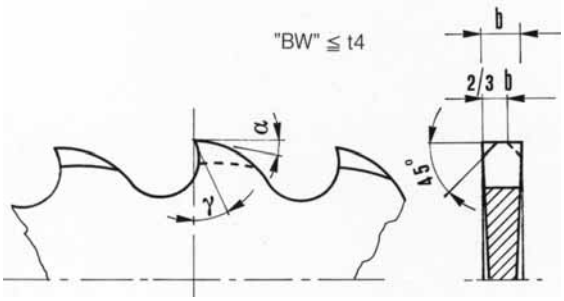
”C” TYPE SHARPENING (HZ)
Coarse toothing with roughing tooth raked on both sides and non−raked finishing tooth. The roughing tooth is about 0.3 mm higher.



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



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



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



The **TIGER 352** uses 350x2.5x32 discs made of HSS DMo5 and teeth with type C sharpening for hollow sections; for solid sections it uses 350x32x2 discs, again made of HSS. The tooth pitch is also important as shown in the table below. Disc selection table for TIGER machine. Other disc characteristics are: dimensions: internal hole diam. 32 mm, distance between fixing holes 63 mm, tooth shape type C.

TIGER MODEL	○ □			○ □			● ■		
	D.	T	Z	D.	T	Z	D.	T	Z
352	350	5	220	350	8	140	350	12	90

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

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

Blade selection table with respect to cutting speed and downstroke speed

RECOMMENDED CUTTING PARAMETERS	CUTTING ANGLE		Cutting section (in mm)																						Recommended lubrificants
	α	γ	10–20			20–40			40–60			60–90			90–110			110–130			130–150			
			T mm	Vt m/1'	Av mm/1'	T mm	Vt m/1'	Av mm/1'	T mm	Vt m/1'	Av mm/1'	T mm	Vt m/1'	Av mm/1'	T mm	Vt m/1'	Av mm/1'	T mm	Vt m/1'	Av mm/1'	T mm	Vt m/1'	Av mm/1'	
Mild steel R = 350–500 N/mmq	20	8	5	50	160	7	45	150	10	45	140	12	40	130	14	40	110	16	35	100	18	30	90	Emulsion – cutting oil
Medium steel R = 500–700 N/mmq	18	8	4	30	130	6	30	120	9	25	110	12	25	110	14	20	100	16	20	90	16	15	80	
Hard steel R = 750–950N/mmq	15	8	4	20	110	6	20	110	8	18	100	11	17	50	14	15	80	16	14	70	16	12	60	
Super hard steel R = 950–1000 N/mmq	12	6	3	15	60	4	15	60	6	14	50	9	14	50	12	13	45	14	13	45	14	12	40	
Hardened and tempered steel R = 950–1300 N/mmq	10	6	2	9	35	3	9	33	4	9	30	6	8	28	8	8	25	10	7	25	12	7	22	
Austenitic stainless steel R = 500–800 N/mmq	12	8	4	20	50	6	19	45	8	18	45	11	17	40	14	15	40	16	14	35	16	12	35	
Martensiticstainless R = 500–800 N/mmq	15	6	4	20	50	6	19	45	8	18	45	11	17	40	14	15	40	16	14	35	16	12	35	
Grey iron	12	8	4	25	100	6	23	100	8	22	90	11	20	80	14	19	880	16	17	70	16	16	60	
Aluminium and alloys R = 200–400 N/mmq	22	10	6	1100	1800	8	1000	1700	12	900	1600	16	800	1400	18	1300	20	600	1100	500	20	1100	500	
Aluminium and alloys R = 300–500 N/mmq	20	8	5	200	400	7	180	400	10	160	350	12	160	300	14	300	16	250	130	130	16	130	250	
Copper R = 200–350 N/mmq	20	10	6	400	600	8	350	600	11	300	550	14	250	550	17	500	18	500	150	120	20	150	500	Emulsion
Hard bronze R = 600–900 N/mmq	15	8	5	400	800	7	400	700	10	350	700	12	300	700	14	600	20	500	200	150	18	150	500	
Phosphor bronze R = 400–600 N/mmq	12	8	4	120	160	8	110	150	8	100	140	10	90	130	12	700	14	70	60	50	16	50	100	
Brass R = 200–400 N/mmq	16	16	5	600	1100	6	600	1100	10	550	1000	12	550	900	16	900	18	500	500	450	18	450	800	Cutting oil
Alloyed brass R = 400–700 N/mmq	12	16	5	500	700	7	400	600	10	350	600	12	350	500	16	500	18	300	300	200	18	200	400	
Titanium and alloys R = 300–800 N/mmq	18	8	4	50	160	4	45	150	6	45	140	10	45	130	12	40	110	14	35	30	18	30	90	
Profiles and tubes with wall thickness 0.05 D R = 300–600 N/mmq	18	8	3	19	130	4	18	120	6	18	110	8	17	110	10	16	100	12	16	90	14	15	80	Emulsion
Profiles and tubes with wall thickness 0.25 D R = 300–600 N/mmq	15	8	2	35	130	3	33	120	4	33	110	5	30	110	8	30	100	10	30	90	12	24	80	

Classification of steels

The tables on this page provide users with information on materials to cut, enabling their classification with respect to hardness and consequently the correct blade to use.

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

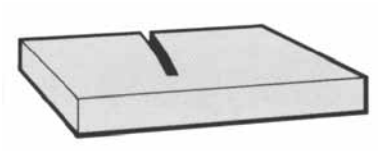
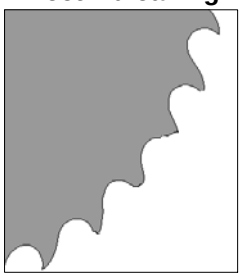
Material	SS Svezia	AISI U.S.A.	DIN Germania	BS Inghilterra	UNI Italia	AFNOR Francia
Carbon steels	1311	1015 – 1035	C 22 – C 35	050 A 20	C 15 – C 35	XC 18
			20 Mn 5 – 28 Mn 6	080 M 46 – 50	C 22 Mn	XC 38 H 1
	1572		CK 22 – CK 50	120 M 19	C 28 Mn	20 M 5
				150 M 28		
Carbon steels	1650	1040 – 1064	CK 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

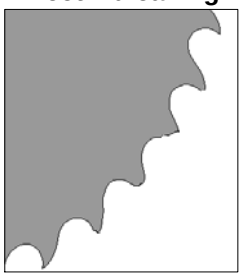
Troubleshooting

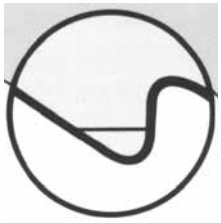
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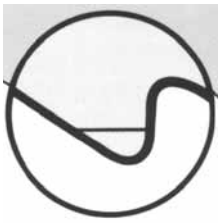
This chapter describes the inspection and troubleshooting procedures for the **TIGER 352**. Regular inspections and efficient maintenance are essential to ensure your machine gives you a long, trouble−free service life. The chapter is divided into two sections: the first being dedicated specifically to TROUBLESHOOTING BLADE AND CUTTING PROBLEMS, while the second TROUBLESHOOTING section concerns troubleshooting general machine operating faults. Taken together they form a comprehensive troubleshooting guide which will enable you to follow a methodical procedure for solving any problem.

Troubleshooting blade and cutting problems

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

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

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

PROBLEM	PROBABLE CAUSE	SOLUTION
Rapid tooth wear 	◗ Material defective	☞The materials may present altered zones either on the surface, such as oxides or sand, or in section, such as under−cooled inclusions. These zones, which are much harder than the blade, cause the teeth to break: discard or clean these materials.
Broken blade 	◗ Head speed too high	☞Reduce head speed.
	◗ Teeth in contact with material before starting the cut	☞Always check the position of the blade before starting a new job.
	◗ Insufficient coolant	☞Check the coolant level and clean piping and nozzles.
	◗ Vibrations	☞Workpiece vibrates in the vice: check that the slide is regulated correctly; check the clamping pressure and if necessary increase.

Troubleshooting machine faults

PROBLEM	PROBABLE CAUSE	SOLUTION
For version MA: Cutting vice will not close or will not open	◗ VM: Cutting Vice Valve	☞Make sure the valve is operating correctly, replace if necessary.
BMT not energised (Minimum Tension Coil)	◗ Electrical power supply	☞Check: the phases; the cables; the plug; the socket.
	◗ BMT Reset switch	☞Make sure that the minimum tension coil is energised when switch is turned from 0 to 1. If it is not, replace the switch.
	◗ Emergency stop pushbutton in	☞Make sure the emergency stop button is released: turn it clockwise through 1/4 of a turn to release it.

PROBLEM	PROBABLE CAUSE	SOLUTION
For version MA: Cutting vice will not close or will not open	◗ Vice cylinder	☞Check that air is not leaking through the cylinder seals, by removing the hose (from the quick connector), where there is no pressurized air, and checking whether air escapes from the joint. If air is escaping, replace the seals or the entire cylinder.
	◗ Compressed air supply hose	☞Check the hose is not kinked or blocked. Remove the obstruction.
Spindle motor will not turn	◗ Electrical power supply	☞Check: the phases; the cables; the plug; the socket. Also check that the motor connections are in place.
	◗ Key operated safety switch	☞Check that the phases are present both on the input and output. Otherwise replace.
	◗ Contactor	☞Check that the phases in it are present both on the input and output, that it is not jammed, that it closes when powered and that it is not causing short circuits. Change if any of these problems are found.
	◗ Thermal relay	☞Make sure it is closed, ie check that the phases are present in input and output, that it is not causing short circuits and responds when the reset coil is closed. If it has tripped to protect the motor, check that the absorption values are balanced and do not exceed the motor's rated values. Change if necessary.
	◗ Motor	☞Check that it has not burnt out, that it turns freely and that there is no moisture in the connection terminal board box. The winding can be rewound or replaced.

Accessory Installation

11

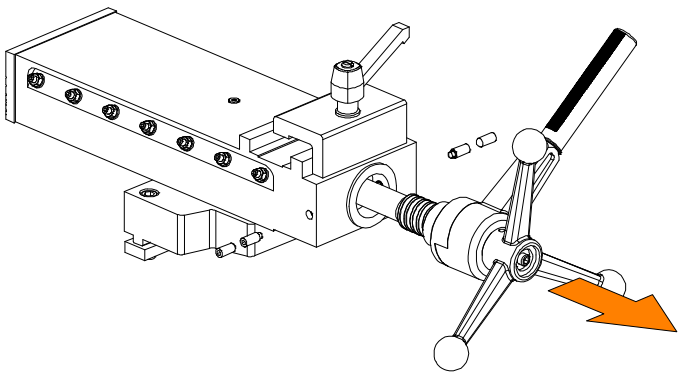
This chapter provides a list of the available accessories that can be fitted to this machine, along with assembly instructions.

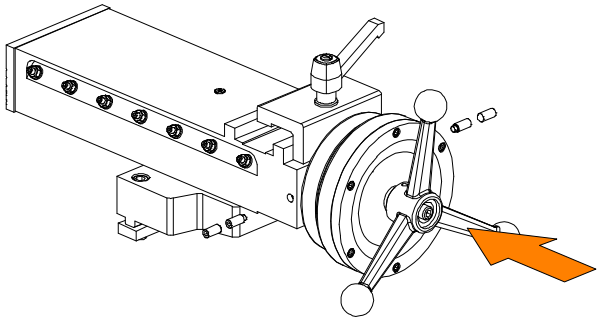
Vice

As well as the clamp fitted as standard to the machine, a pneumatic clamp, second pneumatic clamp, second manual clamp and pneumatic vertical clamp can also be fitted. The instructions for fitting the various clamps are given below.

To fit the pneumatic clamp proceed as follows:

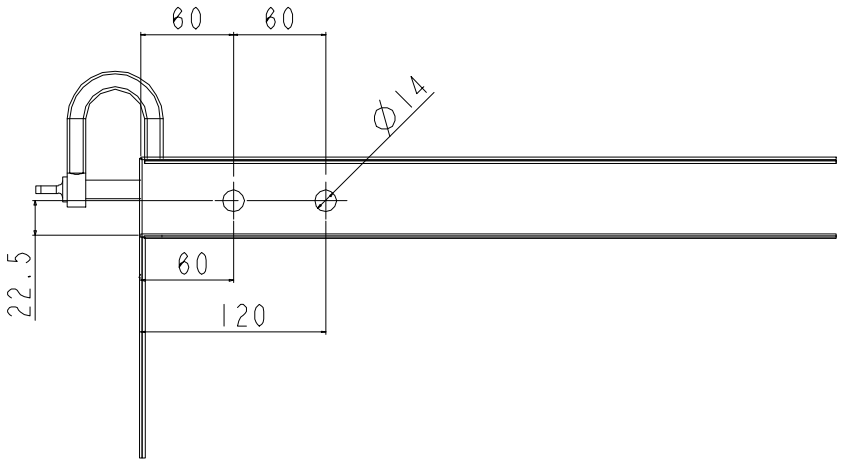
- remove the grub screw and counter−screw holding the clamp drive screw bushing in place, as shown in the figure;



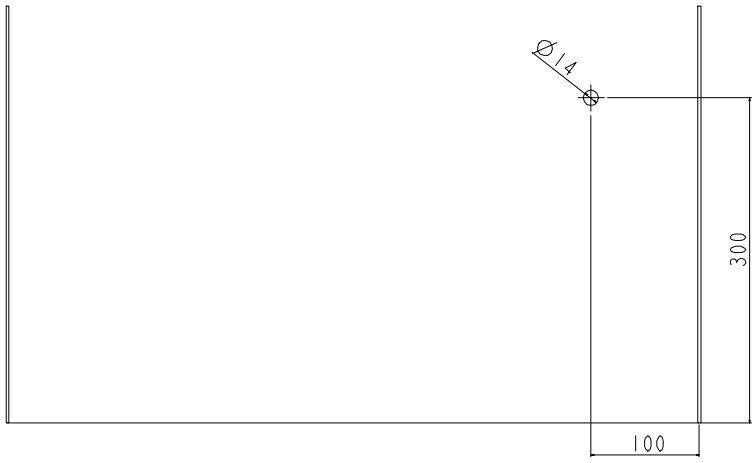


- remove the clamp drive screw group, the bushing and the hand wheel from the slide, and fit the clamp drive screw group, pneumatic cylinder and hand wheel provided in the kit;
- fit the pneumatic cylinder and drill two holes aligned with the fixing holes in the slide. Refit the grub screw and counter−screw;
- Fit the air filter group and secure it to the plate inside the base using the screws provided.

- Drill two 14 mm holes at the points shown in the figure, at a distance of about 10 cm one from the other. Fit the manual clamp opening/closing valve in the left hand hole, and secure it with the lock nut;



- Drill a 14 mm hole in the rear of the base. Screw into this hole the air feed pressure relief valve as shown in the figure;

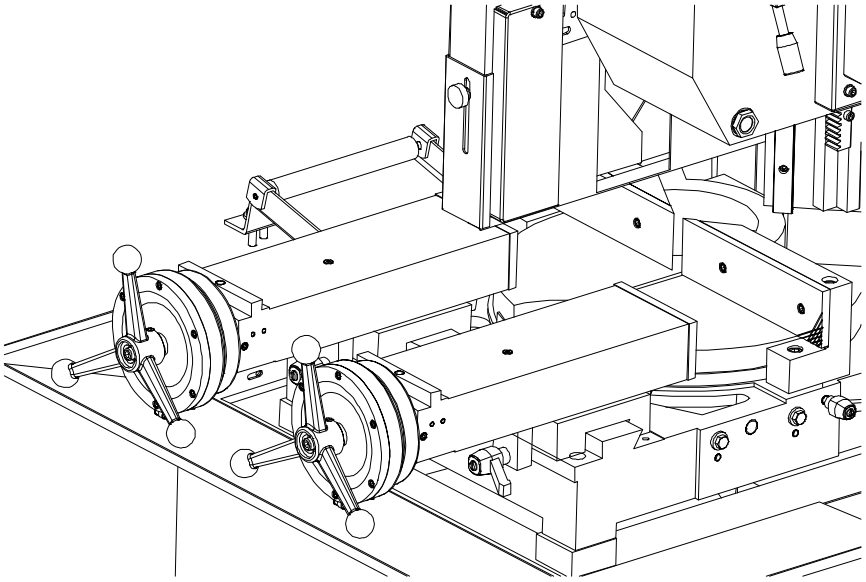


- Connect the air feed hose (ø 8 mm) from inside the base to the air filter group. Connect the air hose (ø 8 mm) from the air filter group to the manual valve. Connect the two small hoses (ø 4 mm) from the opening and closing unions on the manual valve to the quick connectors on the pneumatic cylinder.
- Reconnect the compressed air supply to the machine, and operate the manual valve to test the clamp opening/closing action.

To fit the second pneumatic clamp proceed as follows.

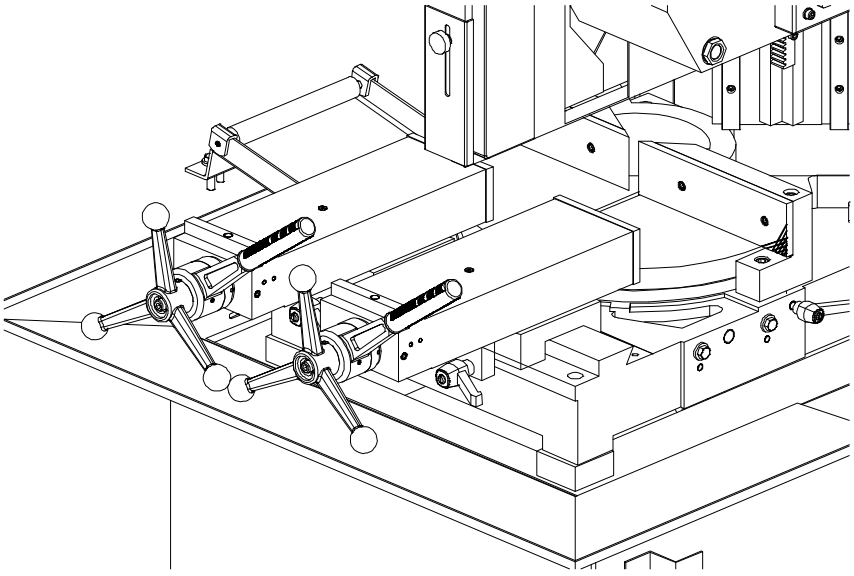
- Position the clamp to the right of the blade guard and tighten the feed screw locking plate.

- Connect the pneumatic hoses to the opening and closing unions on the pneumatic cylinder of the main pneumatic clamp using Y connectors.



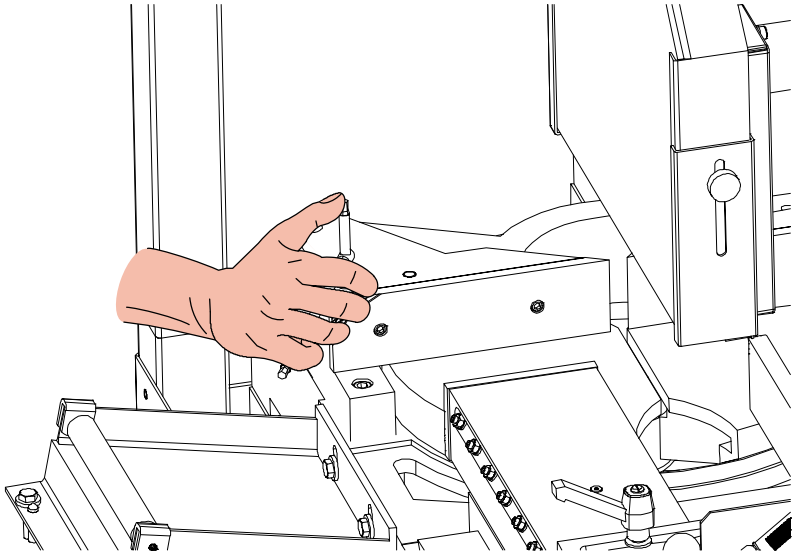
To fit the second manual clamp proceed as follows.

- Position the clamp to the right of the blade guard, in the groove in the fixed platform. Tighten the fixing screws.

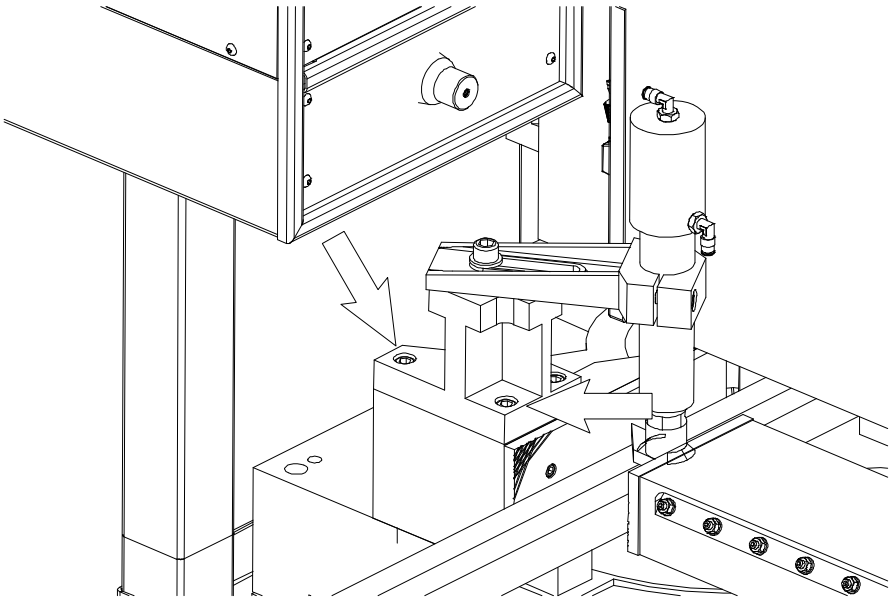


To fit the pneumatic vertical clamp proceed as follows.

- Remove the fixing screws from the left hand work stop.



- Position the clamp support, aligning the holes in it with the fixing screw holes. Secure the clamp support with the screws provided in the kit.

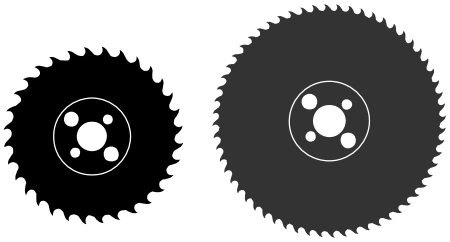


- Push the hoses (ø 4 mm) from the vertical clamp through the hole in the base behind the fixed platform. Pull them as far as the Y connector to be fitted to the manual valve.

Circular blade

The machine fits:

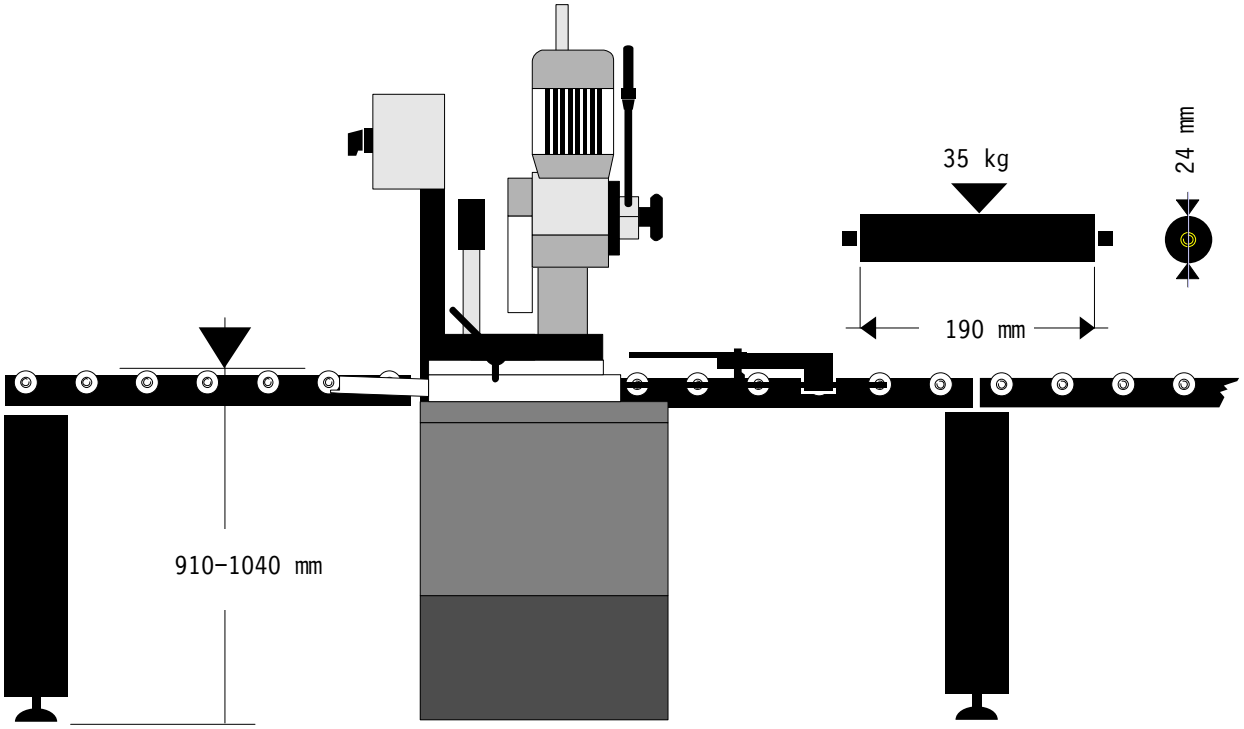
- circular blade HSS DMo5/M2 D.350x32x2.5 for profiles;



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

Roller table

- KK200 roller table module for feed side, 1500 mm;
- KK200 roller table for discharge side, 1500 mm;

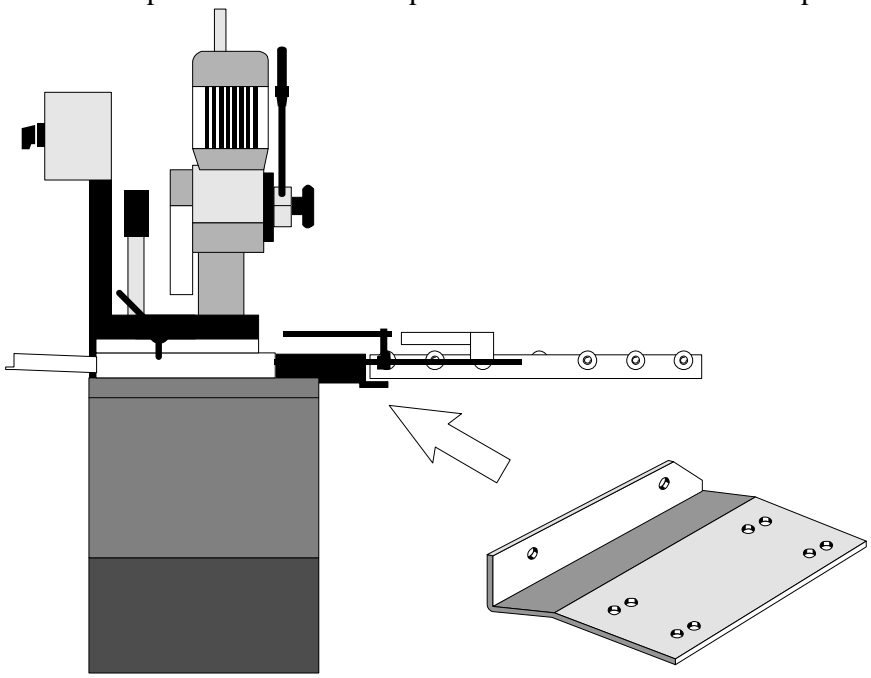


- KK200 roller table for discharge side, 3000 mm;
- KK200 roller table for discharge side, 4500 mm;
- KK200 roller table for discharge side, 6000 mm.
- To fit the roller loading platform on the loading side, the machine has a bar−support arm that one end of the roller−way can be positioned on and then screwed in place.
- To install the roller loading platform on the discharge side an adapter must be used, with or without a support, as explained in the paragraphs that follow.

Adattatore pianale a rulli lato scarico

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

- ▶ remove the two TE screws from the right side of the slideway;
- ▶ attach the adapter and secure it in place with the screws removed previously.

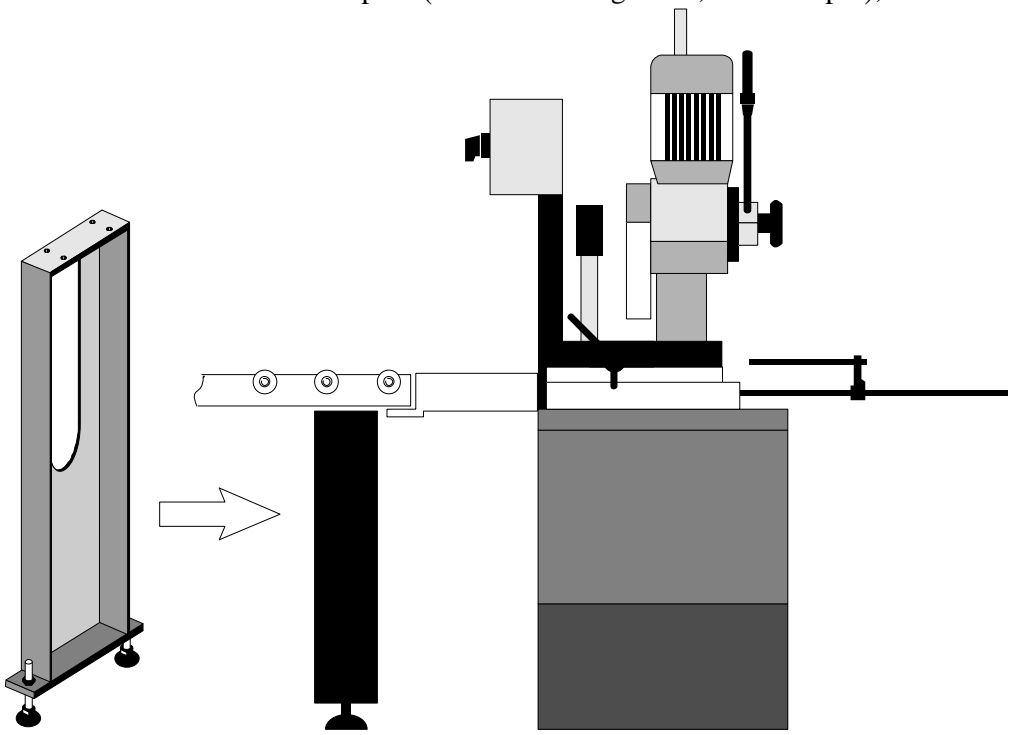


- ▶ Attach the outfeed rolling deck by fixing it with the screws supplied.

Feed side roller table support

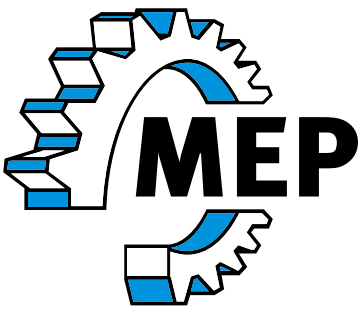
This device is used to increase the load−bearing strength of the roller table, both during feeding and discharge. The steps which should be followed to assemble it are illustrated below:

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



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

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The guarantee shall not apply if the buyer was aware of defects in the product when buying it or if defects were clearly recognizable.
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