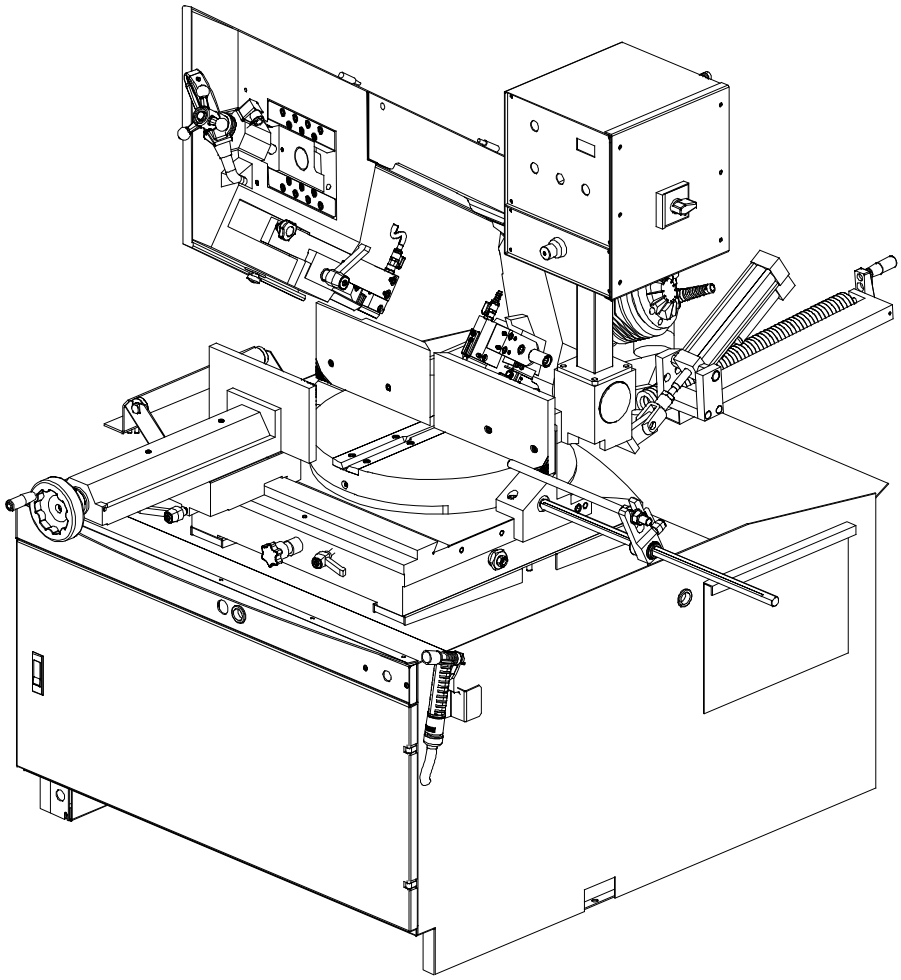


USE AND MAINTENANCE MANUAL

EN DM-12

YEAR OF MANUFACTURE: _____

CE

EN

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

The manufacturer:

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

Hereby declares that the bandsawing machine:

Machine Type:	**SAWING MACHINE**
Machine model:	**DM 12**
Serial number:	
Year of manufacture:	

is in specification with the following directives:

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

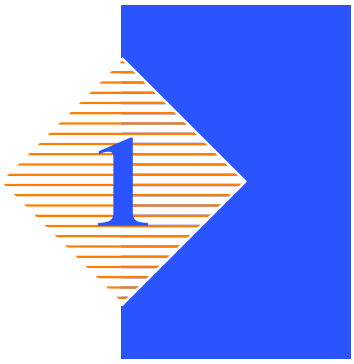
Responsible of a Technical File
(Walter Di Giovanni)

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

Managing Director
(William Giacometti)

Pergola, lì _____

Introduction and technical specifications



Foreword

Hyd- Mech, in response to modern production techniques, has developed the new **DM12**.
This work tool has been designed to satisfy the wide range of cutting needs of a modern workshop with simplicity and reliability, while at the same time complying with all EEC safety standards.
The **DM12** is structurally rigid, silent and safe: it produces a minimum of waste (1.2 mm) while its great versatility makes it suitable for cutting various materials such as stainless steel light alloys, aluminium, copper and bronze at high speed and with high precision.
Its high cutting capacity, combined with the possibility of making inclined cuts from 60° left to 45° right, make this model the ideal solution for satisfying the wide strange of cutting needs of machine shops, turneries, structural steel shops and engineering workshops.
Please keep this instruction manual for future reference in a known location and easily accessible to all users of the device. HYD·MECH offers a great variety of options, components, and features for its various models.
Therefore, some of the equipment described in this manual (various illustrations and drawings) may not be applicable to your particular machine.
The information and specifications provided in this manual were accurate at the time of printing. HYD·MECH reserves the right to discontinue or change specifications or design at any time without notice and without incurring any obligation.
We congratulate our clients on having chosen this product, which will give effective and faithful service for many years, especially if the instructions contained in this use and maintenance manual are carefully followed.

Warning This cutting machine has been designed and made specifically for cutting metallic materials.

Machine presentation

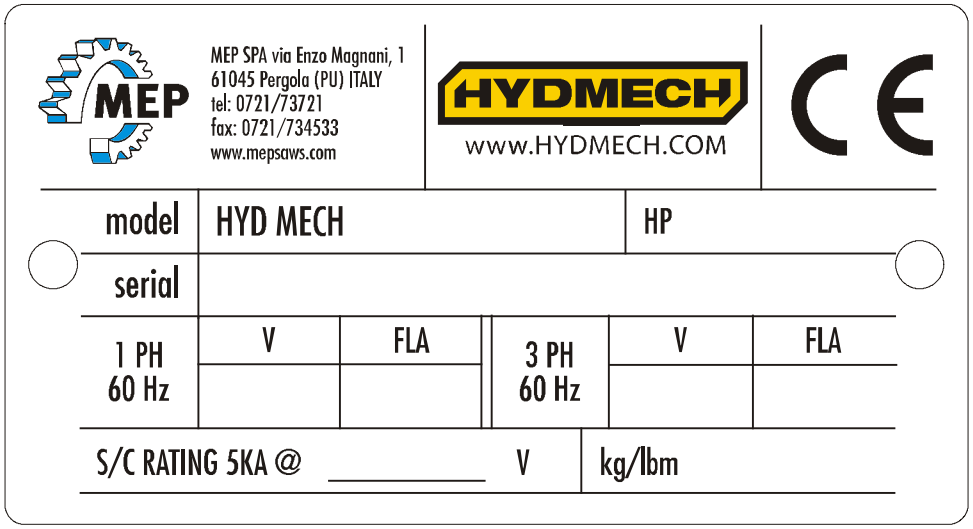
Functioning is semi- automatic/dynamic. After having checked the material in the cutting vice, the operator must hold the cutting head control lever and press the micro- switch to start- up the belt. The belt starts to move and the cuttting head starts its descent. The speed is adjustable using the cutting head speed adjuster on the control board. The cutting head determines the cut of the material. Once the cut has been performed an end run stops the cutting cycle after which the cutting head is manually placed in a high position. After having

re- fed the material the cutting cycle is started up again using the handgrip button.

Machine specification

Name plate

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



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

CUTTING SPEEDS		
1st Slow Speed	mt/min	40
2nd Fast Speed	mt/min	80

Warning All models can be equipped with the Inverter, an optional device, which offers a range of speeds comprised between **20 and 90 mt/min** As the machine is predisposed for the Inverter, it can be installed by the client or factory pre- installed on request made during the ordering procedure.

BAND SAW		
Rated size	mm	3320 x 27 x 0,9
Max/min blade length	mm	3350÷3290
Blade height	mm	27
Blade width	mm	0,9
Band saw tension	bar/Kg	70 / 900

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

RATED ELECTRICAL POWER		
Head spindle motor	KW	1,8/1,5
Electric coolant pump motor	KW	0,10 x 2
Max installed power	KW	2

WORKING PRESSURE MODEL MA (Automatic Vice) OPTIONAL		
Max. working pressure for opening/closing vice	Bar	6
Air consumption for a complete cycle	Nl/min	1,34

N.B. The "air consumption" 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		
Oil for transmission box	capacità Kg	0,32
Oil for optional Cut Control System cylinder	capacità Lt.	0,7
Lubricant/coolant fluid (oil concentration 5- 6%)	capacità Lt	80

VICE		
Vice max. opening	mm	325

SPINDLE MOTOR

No.of poles	Current (Volts)	Absorption (Amps)	Power (Kw)	rpm	Band saw speed
2/4	400	5,6/4	1,8/1,5	2.860/1400	80/40 mt/min
4/8 optional	400	3,1/2,7	1,1/0,55	680/1330	40/20 mt/min
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 norms, publication: IEC 34 of 01/07/1985.					

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

Warning

The machine is supplied with a 2/4 pole three phase motor giving 2 band saw speeds:
- 1ª speed (4 poles) = 40 mt/min
- 2ª speed (2 poles)= 80 mt/min;

The OPTIONAL 4/8 pole motor gives speeds of 36/18 mt./min.

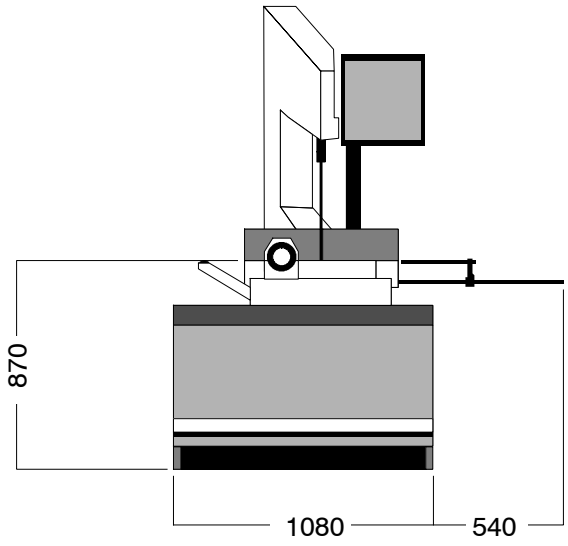
ELECTROPUMP MOTOR
Single phase; Frequency 50 Hz.

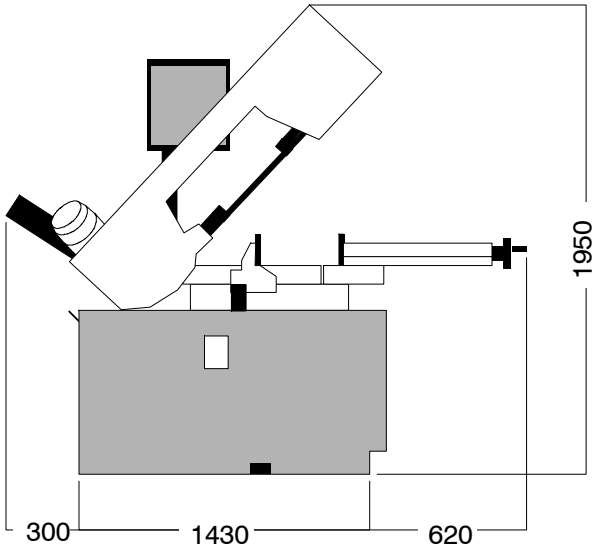
Voltage (Volts)	Absorption (Amps)	Power (Kw)	rpm	Delivery rate lt/min	Head (mt.)
230	0,30	0,06	2800	11	1,5
400	0,18	0,06	2800	11	1,5
Protection rating IP 55.					
Conforming to CEI norms, publication: IEC 34 of 01/07/1985.					

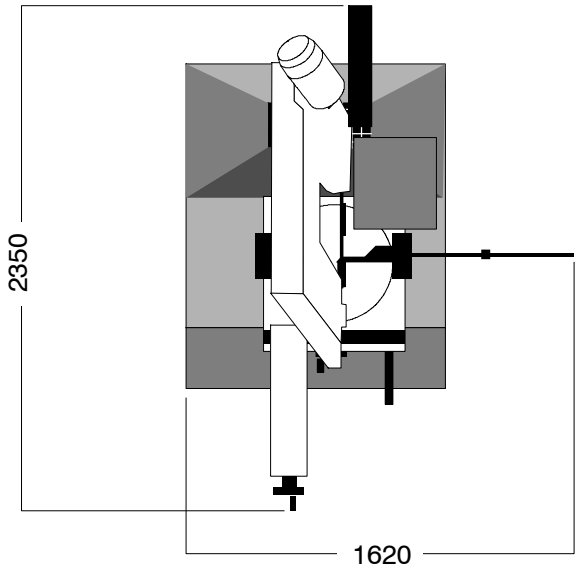
CUTTING CAPACITY			
Section			
0°	300	260	330 x 260
45° ◆	260	250	270 x 200
60° ◆	180	170	170 x 170
45° ◆	200	180	200 x 160

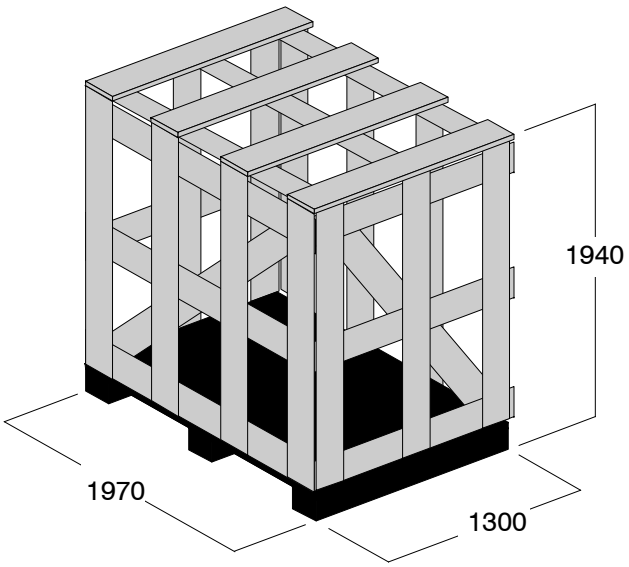
Dimensions

MACHINE INSTALLED		
Work table height	mm	870
Weight	Kg	700









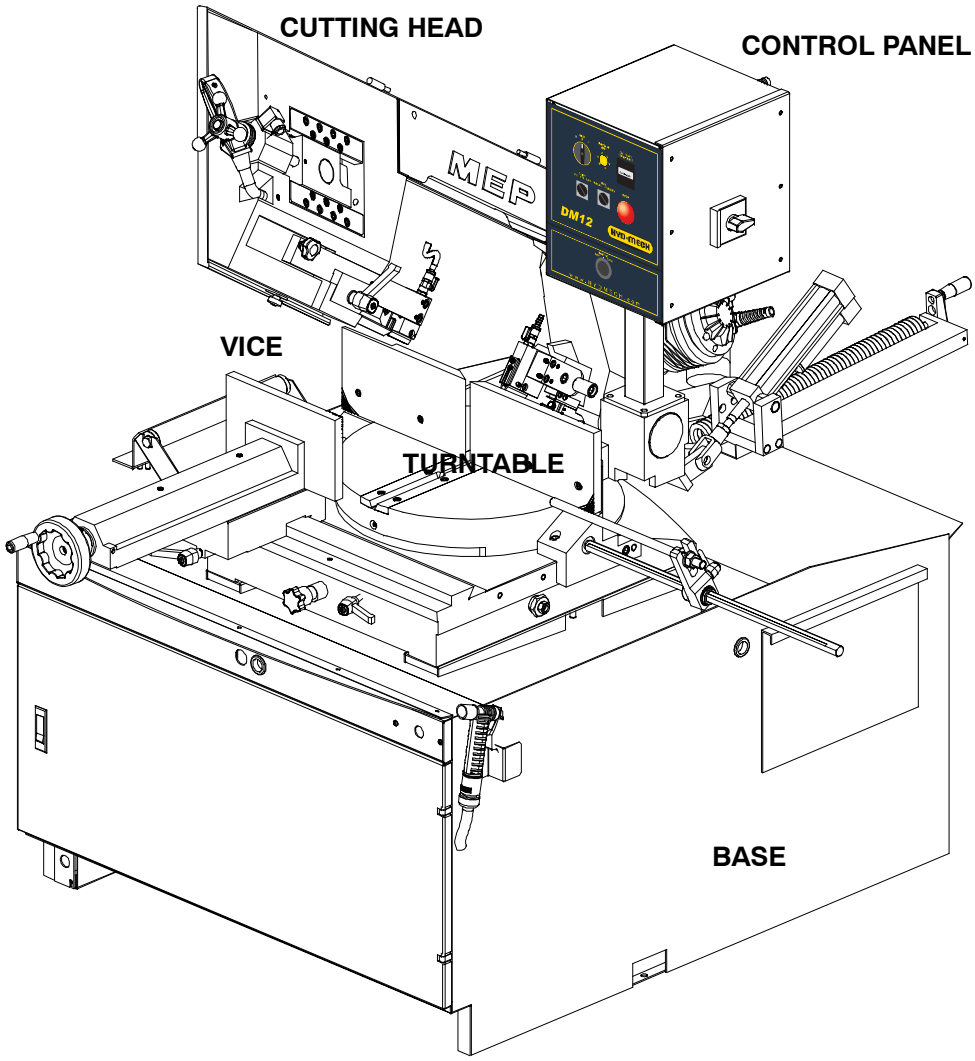
PACKED WEIGHT		
Wooden cage and pallet	Kg	100
Wooden pallet	Kg	30

Functional parts

2

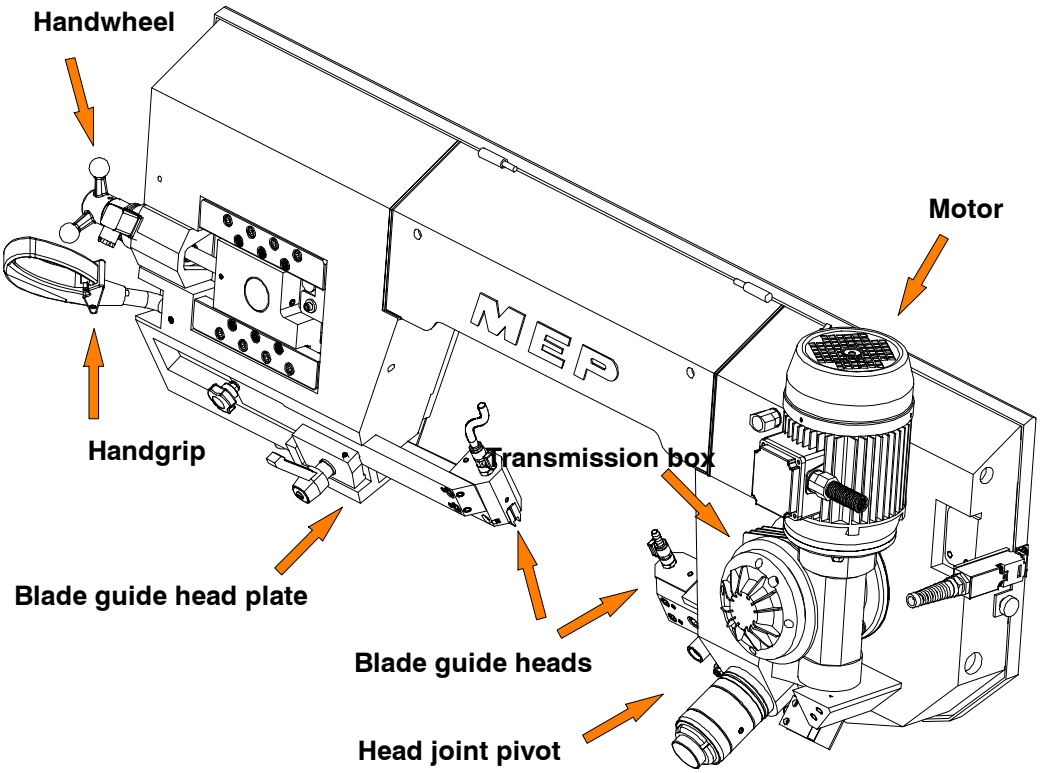
DM12 model

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.



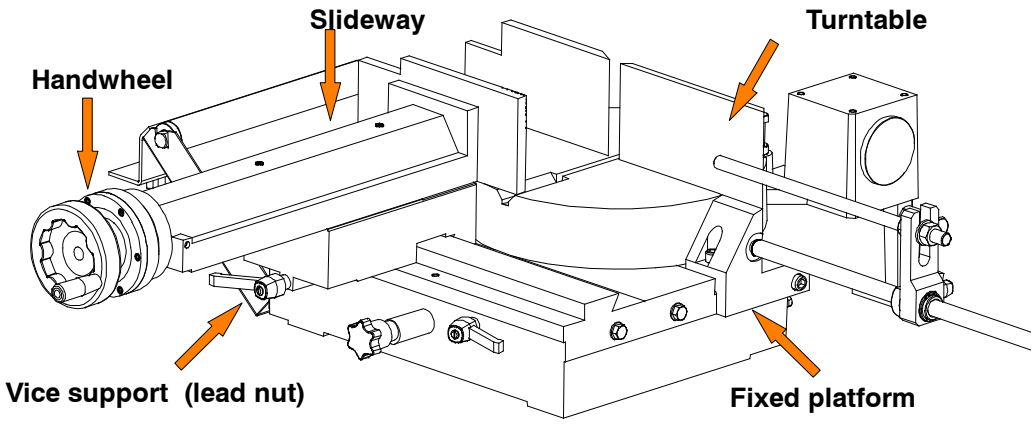
Cutting head

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 cutting head is restrained in its movements by the articulated joint on the surface to be cut, and performs a cutting sequence controlled by the cutting head recall spring and the hydraulic brake.



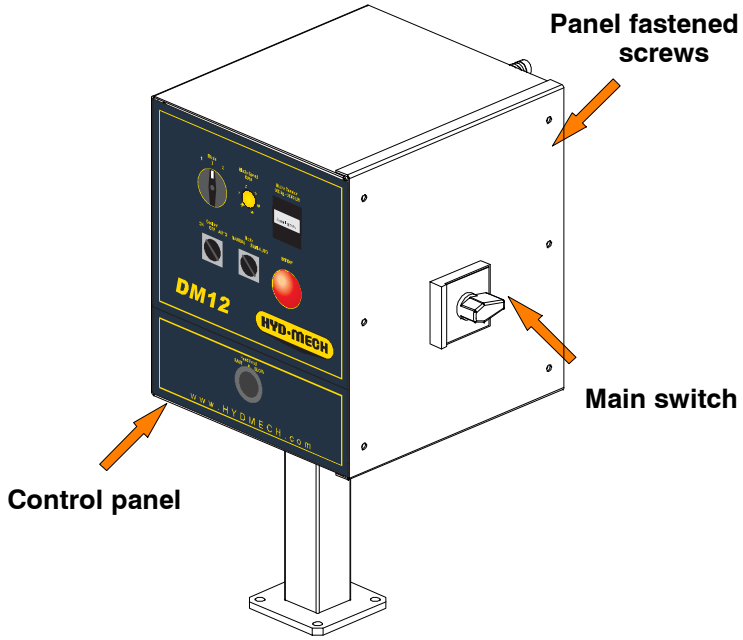
Vice

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).



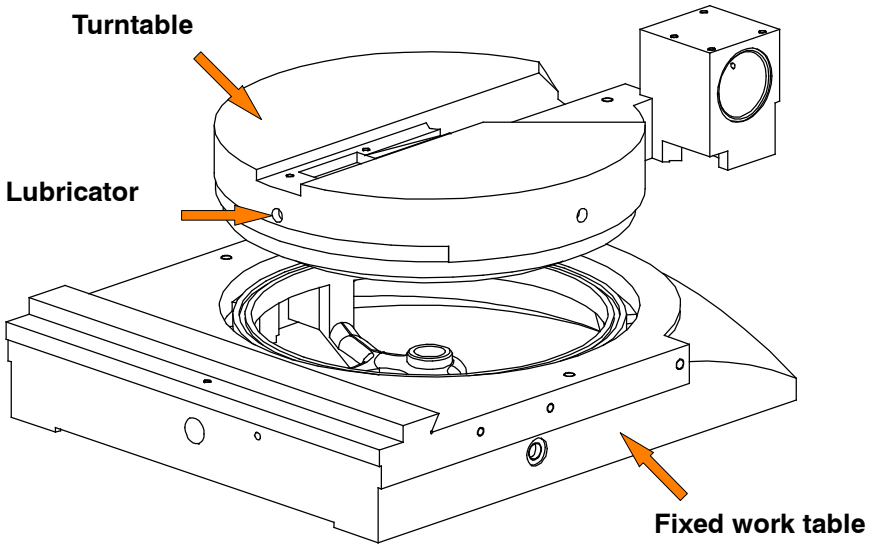
Control Panel

The control panel has a protection rating of IP 54 and contains the electrical equipment. Access is gained by removing the screws fastening a safety panel, while the operator's safety is guaranteed by a key- operated safety switch, designed to prevent any intentional interference with the unit. In order to remove the panel from its mounting, the main switch has to be shifted to 0 (OFF), which automatically cuts off the electrical supply.



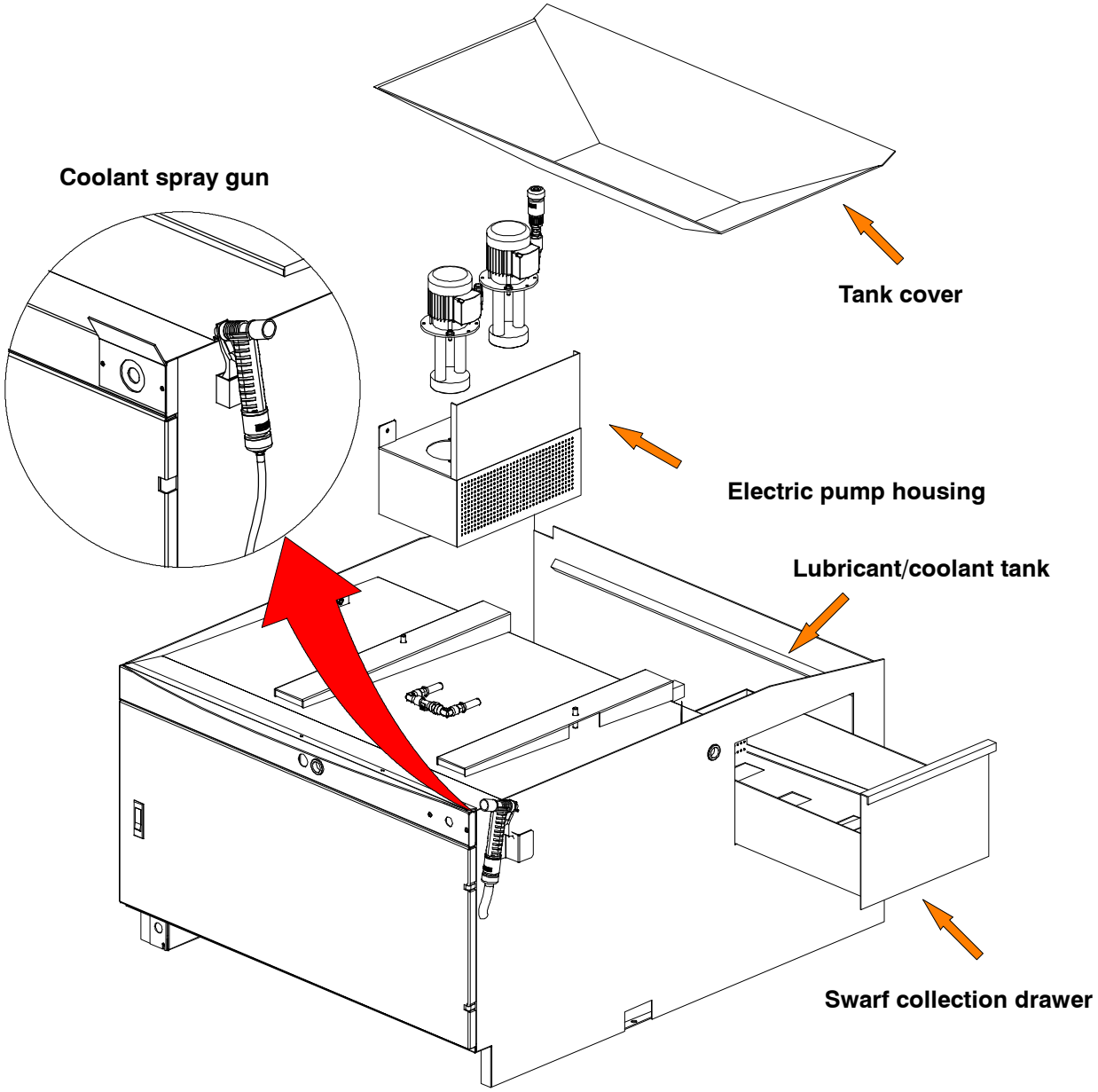
Fixed work table and turntable

Both the fixed work table and turntable are made from cast- iron. The turntable constitutes the fulcrum of the cutting head and the machine's cutting surface, while the fixed table supports the turntable by means of a 420 mm diameter roller bearing, preloaded with a thrust bearing. A lubrication circuit inside the bearing guarantees a long service life and facilitates rotation of the head from right to left for angled cuts.



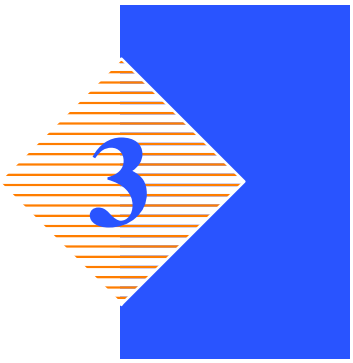
Base

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



On the right side there is the refrigerant fluid gun and the removable shaving collector drawer.

Safety and accident prevention



The **DM12** 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 **DM12** band saw cutting machine is intended exclusively for cutting metallic materials, ferrous or non- ferrous, in section or solid.
Other types of material and machining are not compatible with the specific characteristics of the saw.
The employer is responsible for instructing the personnel who, in turn, are obliged to inform the operator of any accident risks, safety devices, noise emission and accident prevention regulations provided for by international standards and national laws regarding the use of the machine. The operator must be perfectly aware of the position and function of all the machine's controls.The instructions, warnings and accident prevention standards in this manual must be respected without question by all those concerned.The following definitions are those provided for by **EEC MACHINES DIRECTIVE 2006/42/CE** :

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

Attention

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

General recommendations

LIGHTING

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

CONNECTIONS

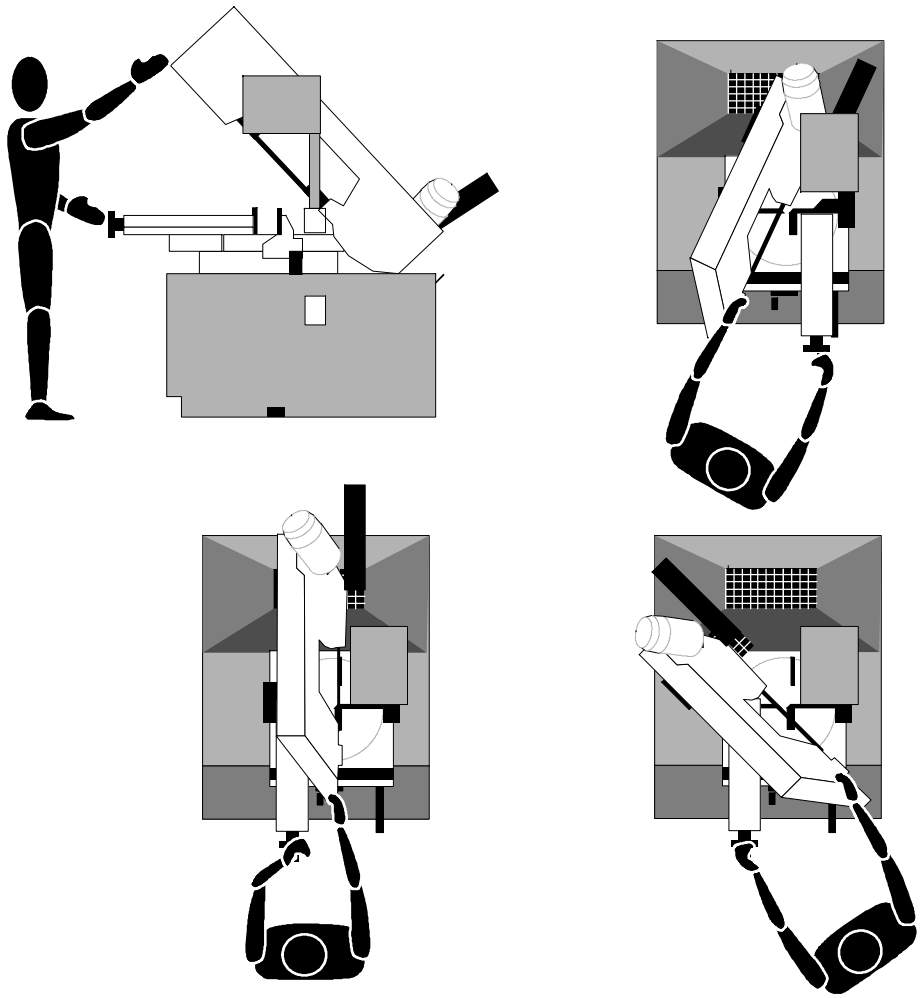
Check that the power supply cables and pneumatic feed systems comply with the maximum machine absorption values listed in the “Machine Specification” tables; replace if necessary.

EARTHING

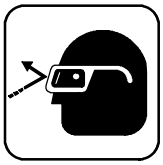
The installation of the earthing system must comply with the requirements set out in IEC STANDARD 204.

OPERATOR POSITION

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



Recommendations to the operator



Always wear proper goggles or protective glasses.

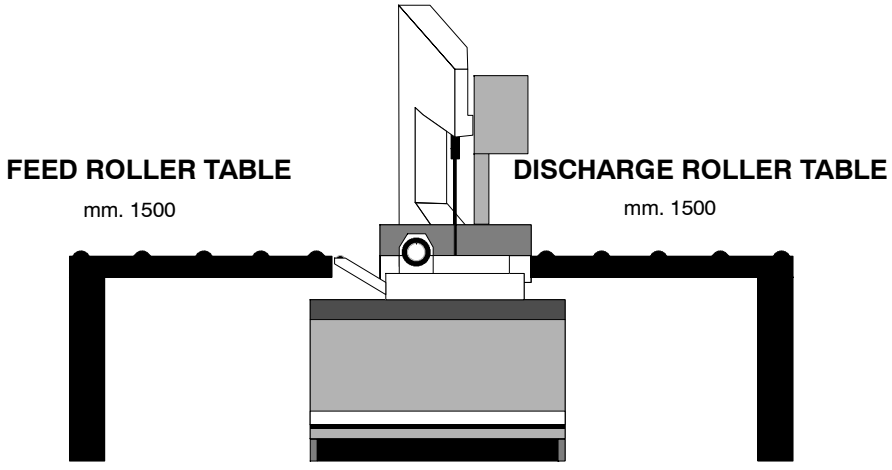
Do not use the machine without the guards in position. Replace the polycarbonate windows , if subject to corrosion

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

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

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

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

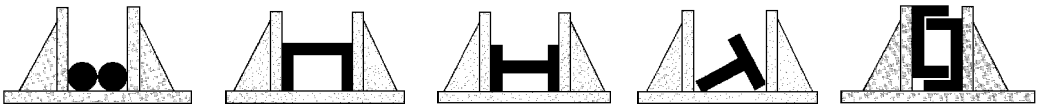


Any maintenance work on the hydraulic or pneumatic systems must be carried out only after the pressure in the system has been released.

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

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

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



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

Never move the machine while it is cutting.

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

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

When using the pneumatic vice (MA version) check that the jaws move right up to and effectively clamp the workpiece, as the maximum travel is only 6 mm, and check that the clamping procedure is correct.

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

Warning: if the blade jams in the cut, press the emergency stop push-button immediately. If this does not free the blade, slowly loosen the vice, remove the piece and check the blade or blade teeth for breakage. Replace the blade if necessary.

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

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

Machine safety devices

This use and maintenance manual is not intended as purely a guide for the use of the machine in a strictly productive environment, it is instead an instrument providing information on how to use the machine correctly and safely. The following standards are those specified by the EEC Committee in the directives regarding safety of machinery, health and safety at work, personal protection and safeguarding of the environment. These standards have been applied to the **DM12** band saw.

Reference standards

MACHINE SAFETY

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

HEALTH AND SAFETY AT WORK

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

PERSONAL PROTECTION

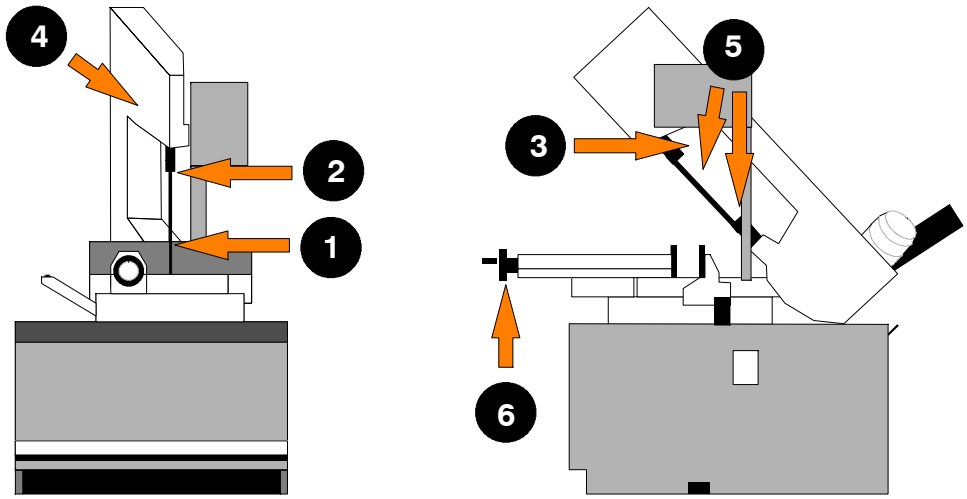
- EEC Directive No. 89/656 and No. 89/686 on the use of personal protection devices.

ENVIRONMENTAL PROTECTION

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

Protection against accidental contact with the blade

1. Metal guard screwed to the rear blade guide head (machine side);
2. metal guard screwed to the front blade guide head (operator side);
3. front head sliding support: when the head is at maximum aperture, the support ensures that the blade is covered, leaving free only the part of the blade engaged in the actual cutting, in accordance with Presidential Decree no. 547/55, art. 108;
4. hinged protective cover over blade, fitted with “removable” closing devices;
5. blade guide plates completely covering the blade teeth;
6. the cutting vice is activated by pneumatic devices, with a maximum stroke of 6 mm. The jaw that locks the workpiece in position, must be brought to within 2÷3 mm of the workpiece.



Electrical equipment

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

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

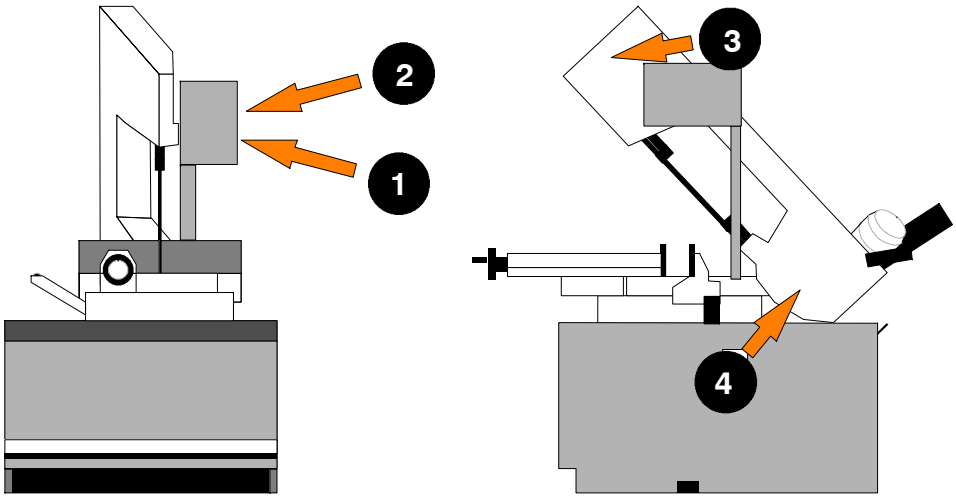
Emergency devices

In accordance with Standard CEI 204- 1:

- **Chapter 5 Section 6 Sub- section 1 “Emergency stop device”**: «the emergency stop device immediately stops all the dangerous and other functions of the machine»;
- **chapter 6 Section 2 Sub- section 4 Point 7 “Protective guards”:** «the removal of protective guards designed to prevent access to dangerous parts or zones causes the machine to stop immediately; replacing the guards does not restart the functions, which must be reset».

...Emergency devices applicable to the DM12:

1. **Emergency stop**: a non- return mushroom- head pushbutton, colour red on yellow background, is located on the control panel of the machine. To release the pushbutton, the actuator must be rotated 45° . After the emergency situation has been resolved, the machine must be reset.
2. **Automatic thermal- magnetic cutout switch with thermal- magnetic relay:** the machine auto switch, 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.
3. **Pressure contact for monitoring blade tension:** the machine stops immediately if the blade breaks or if the tensioner cylinder pressure drops.
4. **Protective guard for blade:** a coded key microswitch is operated if the blade cover is accidentally or intentionally opened during the machine operating cycle, immediately shutting down all functions.



Noise level of the machine

Noise can cause hearing damage and represents one the problems faced by many countries who adopt their own standards. In accordance with the **EEC MACHINES DIRECTIVE 2006/42/CE** , we are listing the standards that specify noise levels for machine tools. This chapter also reports the noise levels produced by the **DM12** during its various operating phases and the methods used for measuring these levels. The Italian standard governing this aspect is D.M.n.277/91 drawn from EEC Directives 80/1107, 82/605, 83/477, 86/188, 88/642, UNI EN ISO 4871 (1998).

Noise level measurement

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

Noise level values

Identification	
Machine type	Band saw for metal applications
Model	**DM12**
Reference standard	ISO 3746

Results		
Test 1st	**Description**	C 40 steel cut - pipe 50x82 mm Bimetal band 3320x27x0.9 S.GLB Z 5/7
	Results	**Mean sound level (Leq) 69,62 dB (A)** Environmental correction (K) 3,9 dB(A) Peak sound power (Lw) 80,34 dB(A)
Test 2nd	**Descriprion**	C 40 steel cut - solid rod 150 mm dia. Ø Bimetal band 3320x27x0.9 M42 Z 3/4
	Results	**Mean sound level (Leq) 67,59 dB(A)** Environmental correction (K) 3,9 dB(A) Peak sound power (Lw) 78,30 dB(A)
Test 3rd	**Description**	34CND6 material cut - pipe 140x130 mm Bimetal band 3320x27x0,9 S.GLB Z 10/14
	Results	**Mean sound level (Leq) 69,14 dB(A)** Environmental correction (K) 3,9 dB(A) Peak sound power (Lw) 79,87 dB(A)

Vibration emission

This sawing machine complies with the norms EN1299 and EN1033, 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 **EEC MACHINES DIRECTIVE 2006/42/CE** . The prescriptions regard two specific aspects in particular:

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

The following text contains a list of the applied standards and the results of the electromagnetic compatibility testing of machine model **DM12**; Test report no. 170201.

Emissions

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

CONDUCTED EMISSIONS				
Gate A	**Freq. (MHz)**	**Q- peak limit (dBuV)**	**Mean value limit (dBuV)**	**Result**
A.C. power supply input	0.15 - 0.5 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

- EN 61000-6-2 (2000) 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.

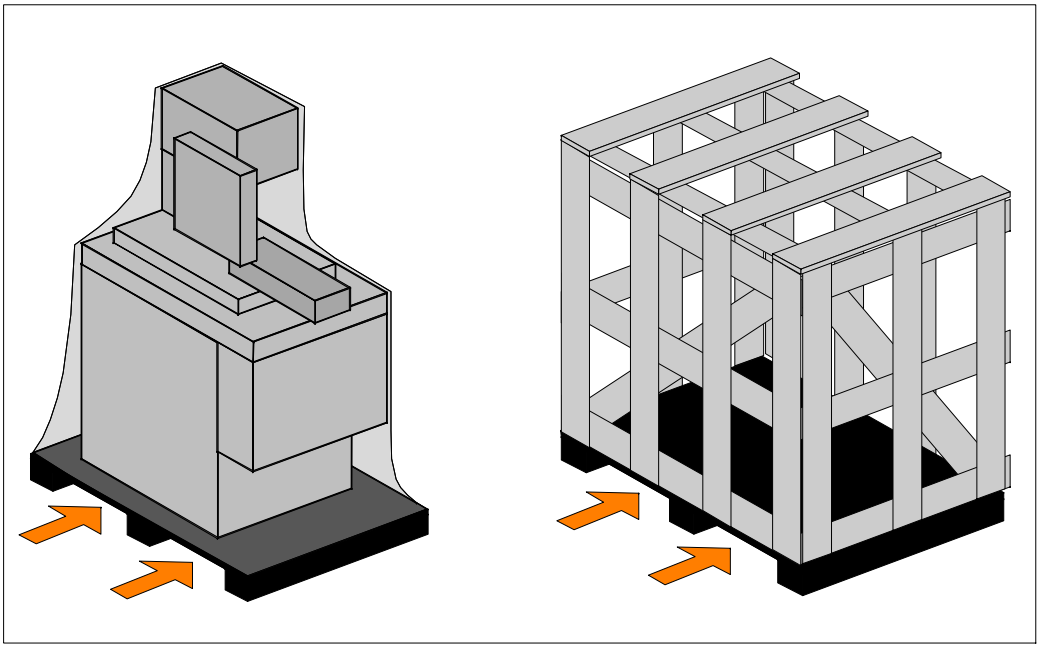
Machine installation

4

Packaging and storage

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

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



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

Warning

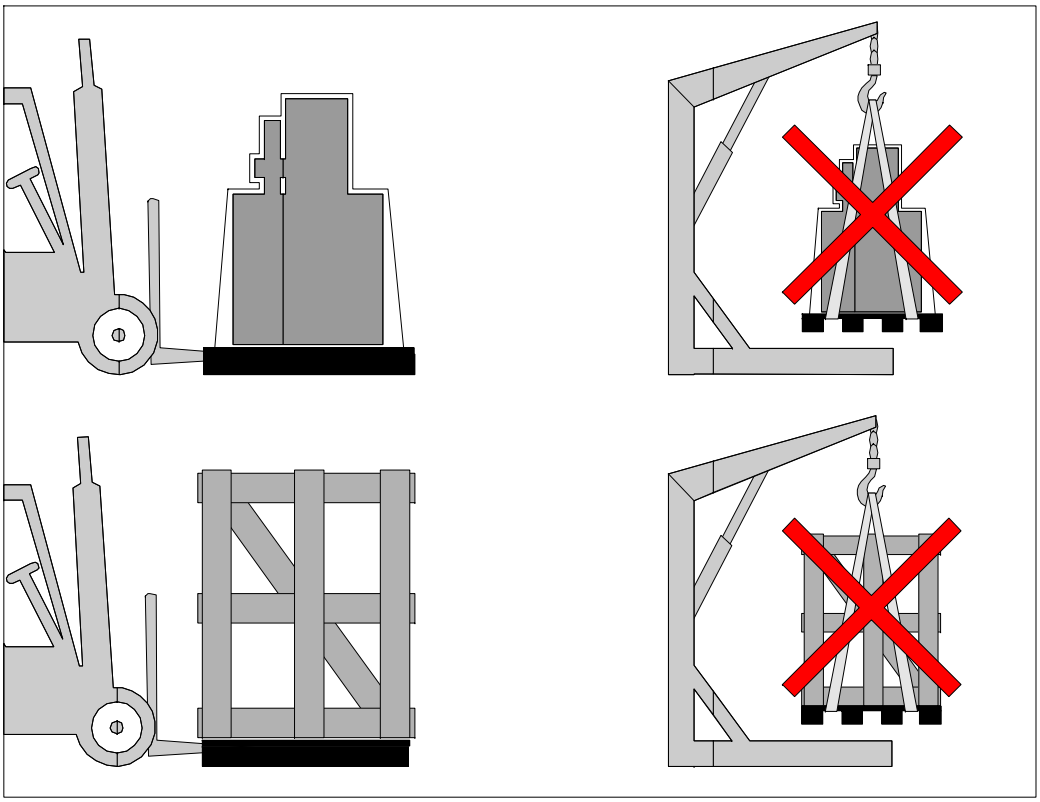
In both cases, for correct balancing the machine must be handled using a fork- lift truck, inserting the tines at the points indicated by the arrows, using the reference marks on the crate itself.

Attention

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

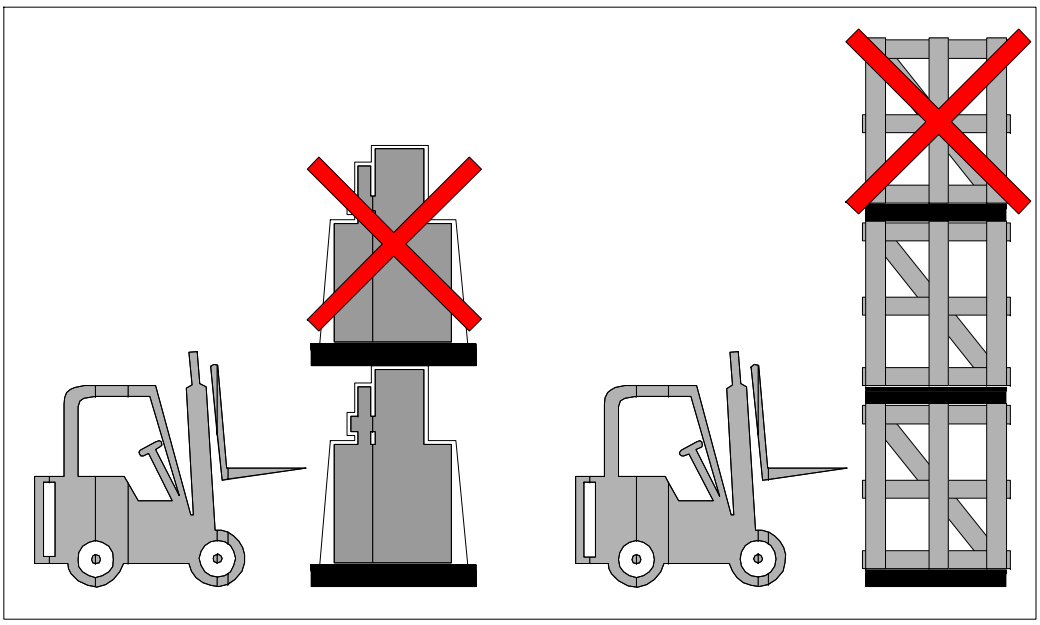
Attention

Do not handle the packed machine using slings.



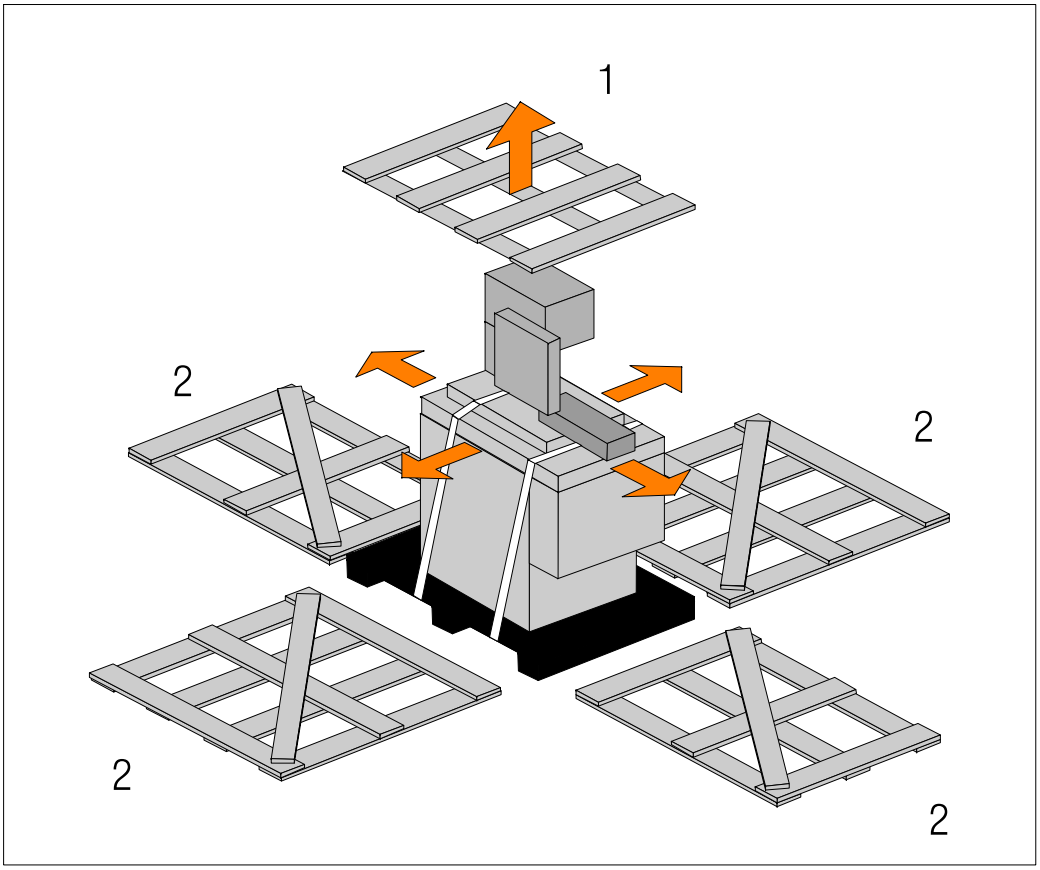
Attention

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

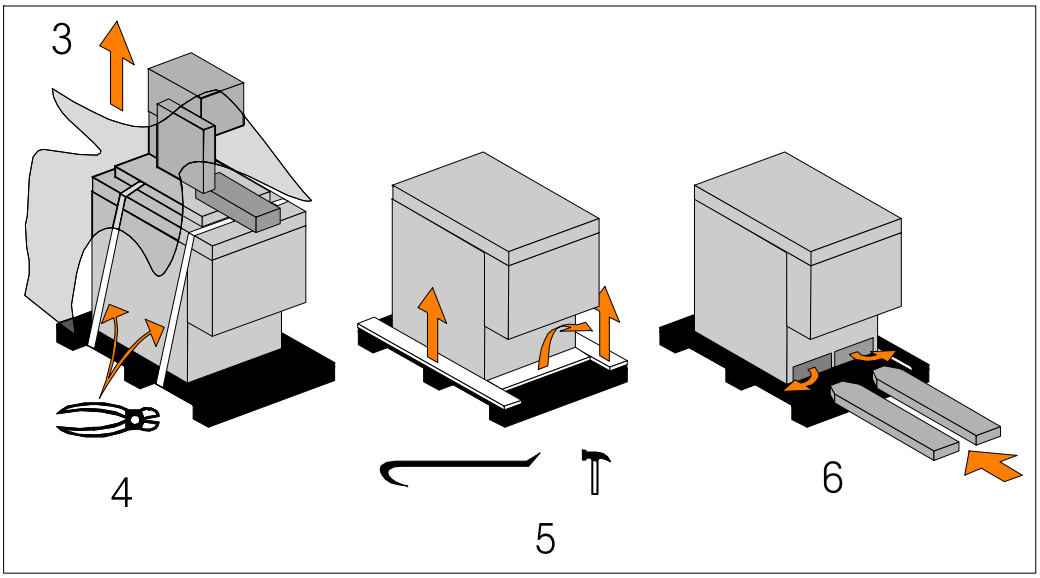


To install the machine, first remove the packing, paying particular attention not to cut any electric wires or hydraulic hoses; if necessary use pliers, a hammer and a cutter.
Open crate in the illustrated order:

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



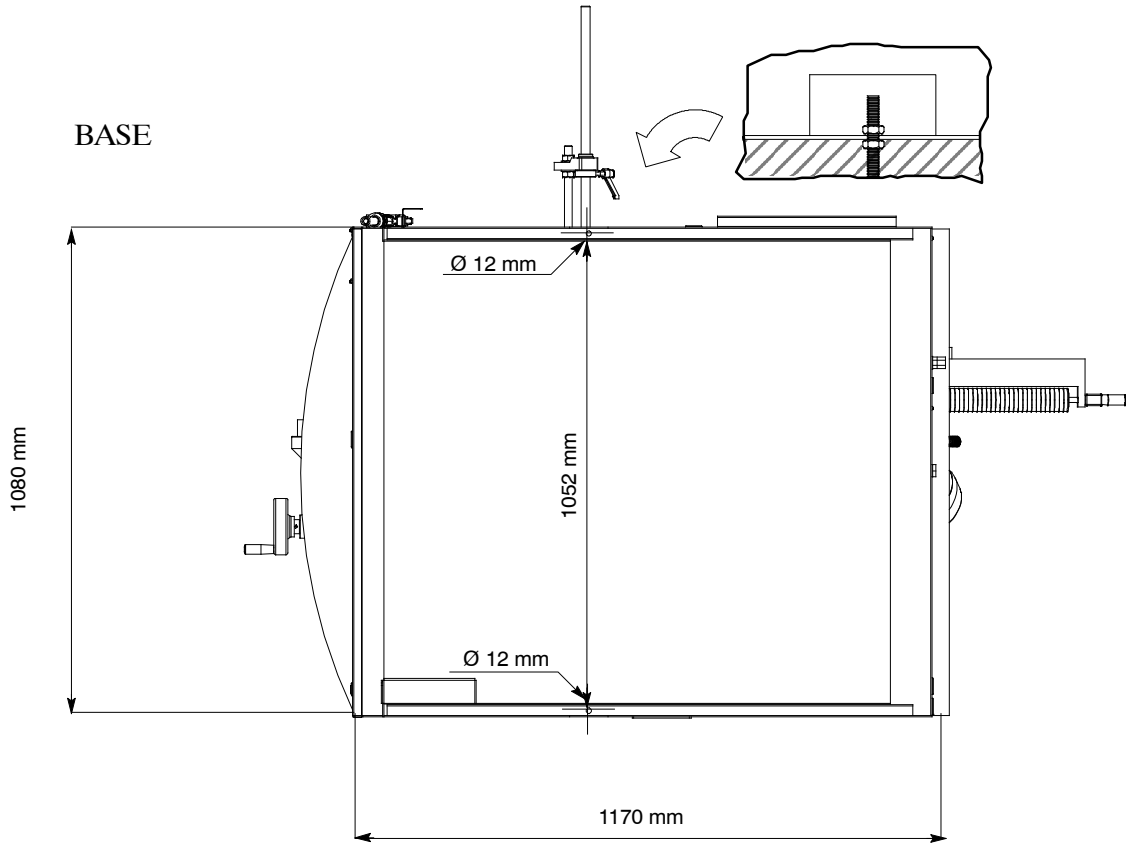
3. remove heat- shrink covering;
4. remove the straps;
5. remove nails from pallet securing planks and remove planks;
6. remove the front panel and insert fork tines.



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

Anchoring the machine

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



Minimum requirements

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

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

Warning

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

Check list

Before starting installation, check that all the accessories, whether standard or optional, supplied with the machine are present. The basic version of the **DM12** 2- SPEED machine is supplied complete with:

CHARACTERISTICS	STANDARD	OPTIONAL
Ergonomic and functional pedestal that allows total recovery of the refrigerant liquid even during maximum slant cutting	✓	
Double return spring for head upstroke	✓	
3320 x 27 x 0,9 bimetal blade for solid and section materials	✓	
M42 bimetallic belt		✓
Right/left slide locking unit, with quick locking/release	✓	
Vice with rapid jaw positioning	✓	
Blade cleaning brush	✓	
Designed for transpallet handling systems	✓	
Electric control panel (totally identifiable cabling, stand- by, main switch with lockable panel- closing device, speed switch, emergency device, thermal- magnetic overload cutout, minimum voltage relay, voltage drop protection, 24 V low- voltage plant)	✓	
Blade protection behind and below blade guide heads	✓	
IP 55 handgrip	✓	
Precision stops for cuts at 0°, 45°, 60° left and 45° right	✓	
Accessory kit	✓	
Vice control pedal (only with MA version)*		✓
4/8 pole motor for 40/20 mt./min. speed*		✓
Automatic Vice kit (MA)		✓
Semi- automatic/dynamic cutting cycle	✓	
Electronic speed control (inverter) 20 to 90 mt/min		✓
Tank for the refrigerant liquid made in the pedestal, with a pair of electrical pumps for the refrigeration and lubrication of the belt and shavings drawer. This can be replaced by a motorised shavings evacuator. (optional)	✓	
Rotating top mounted on a roller bearing with a diameter of 420mm pre-loaded with a thrust bearing complete with replaceable steel plates on the work top	✓	
Gun for washing the work tops	✓	
Blade cleaning device with motorised brush*		✓
K60/K100 roller table on supply side - kit 1500 mm		✓
Feed side roller table support		✓
Discharge side roller table adapter with support		✓
K60/K100 roller table for discharge side, 1500÷6000 mm.		✓
5 l can of emulsible oil		✓

***ACCESSORIES AVAILABLE ON REQUEST**

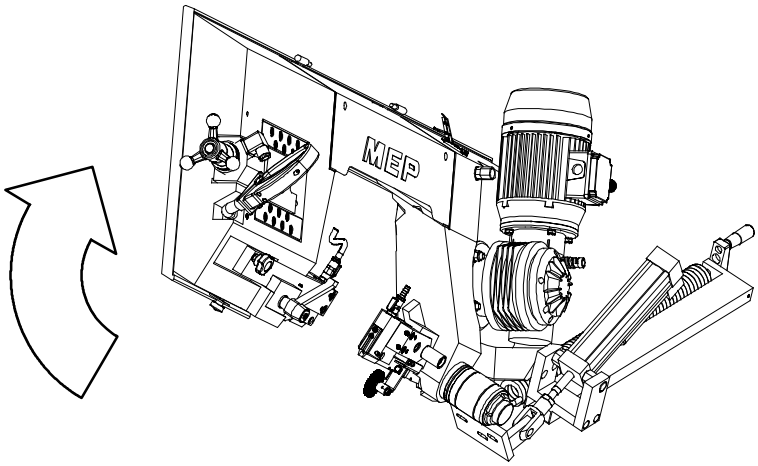
The bag of accessories is enclosed in the machine before being packed and contains:

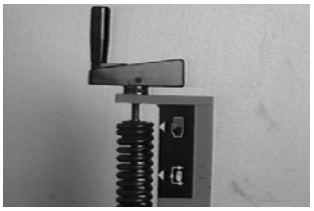
- 3,4,5,6 and 10 mm Allen keys;
- 36 mm wrench;
- pipe wrench 10 mm;
- measuring rod for cuts- to- measure;
- arm with roller on which the bars to be cut rest and for fitting the feed side roller tables;

- manual pump for topping up the oil in the pneumatic cylinder;
- Use and Maintenance manual, including order form for parts in relevant user language.

Balancing the cutting head

Before making the electrical and pneumatic connections (MA version), the head return springs must be tensioned to balance the cutting head weight.
Set the function selector on manual. Tension the cutting head recall spring using the hand wheel until the first turn is aligned with the arrow that indicates the position in manual.

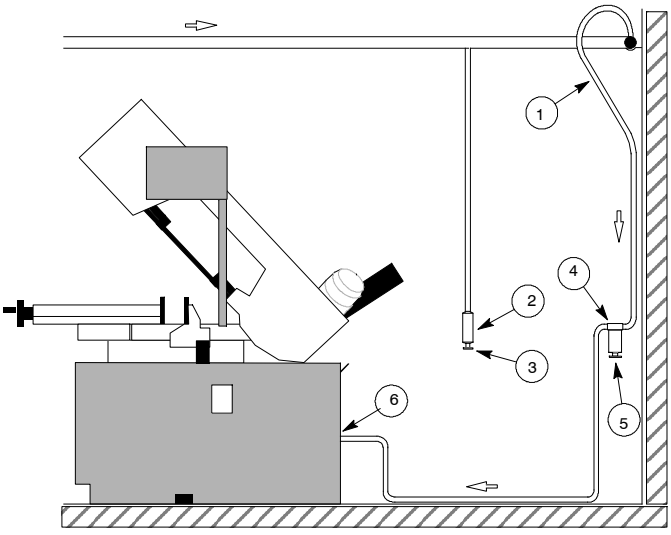




Connection to the compressed- air supply (MA version)

The MA version (automatic vice) is supplied with an air treatment unit for the vice closing system, controlled by a pneumatic cylinder. To ensure perfect performance and long service life we advise that the machine be connected to a compressed air system having the characteristics illustrated in the following diagram.

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



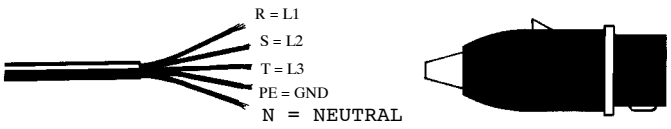
Connection to the power supply

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.

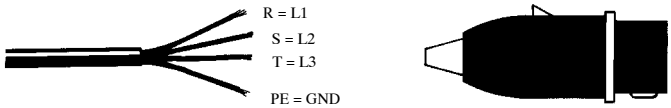
To connect the machine to the power supply, proceed as follows:

- 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



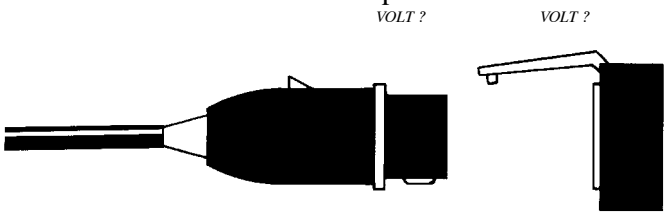
CONNECTION FOR **"4-CORE"** WIRE SYSTEMS WITH NEUTRAL



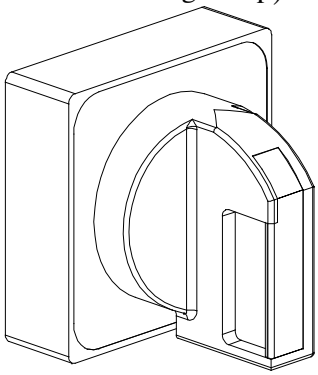
Attention

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.



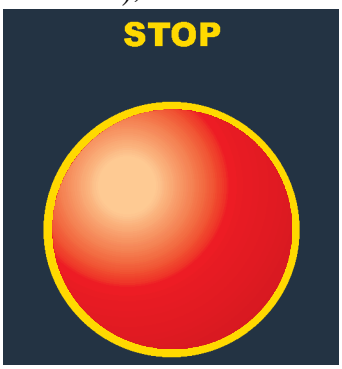
- Power up machine by rotating the main switch located on the right side of the control panel (The STAND BY LED lights up).



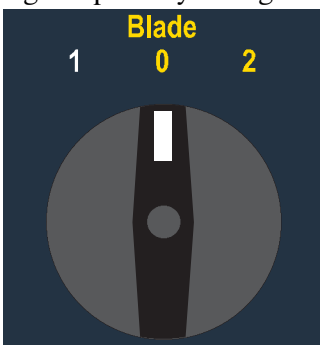
Check that the motor is rotating in the correct direction. For this check the following operations must be carried out:

- set the blade tension to 70 BAR (900 kg);
- make sure the cover is properly closed: at the back of the cutting head there is a bayonet limiter for correct cover closure;

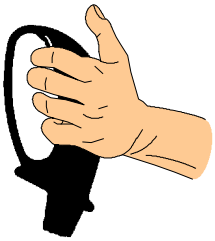
▶ make sure that the machine is not in an emergency condition (red mushroom- head pushbutton released);



▶ select a cutting speed using the polarity change switch;

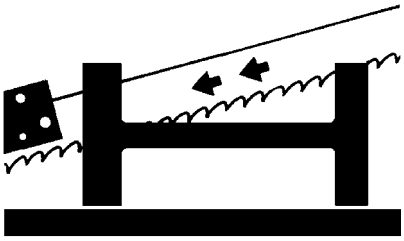


▶ operate the jog button on the manual head control lever;



N.B. Check that the cutting head descent speed adjuster is at zero.

▶ if all the above operations have been carried out correctly, the blade motor will start up and the blade will start rotating.



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

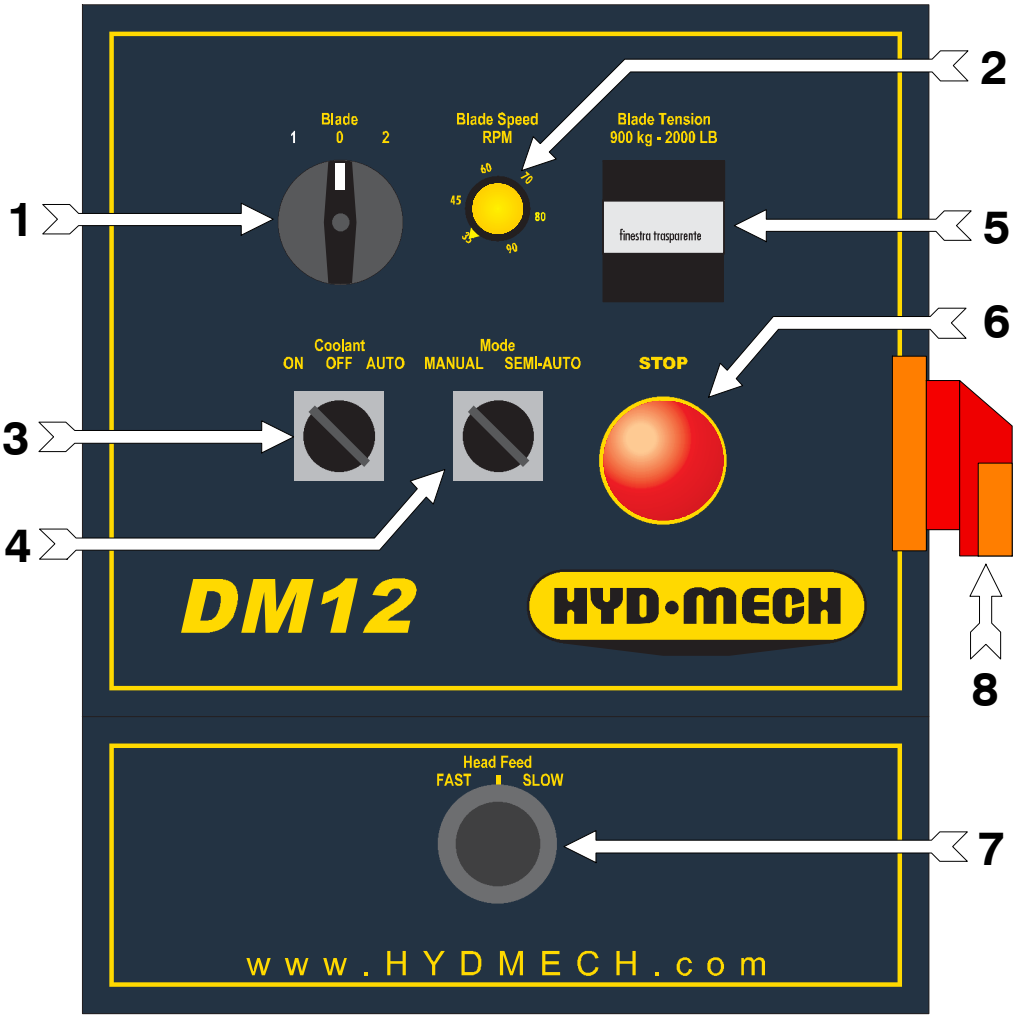
The sawing machine is now ready to start the work for which it was designed. Chapter 5 provides a detailed description of the various functions of the machine and its operating cycles.

Description of machine operation

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 **DM12** control panel are shown in the diagram below. Each arrow has a number which corresponds to the descriptions that follow.



1 - POLARITY CHANGE SWITCH

This selects the blade cutting speed, 40/80 mt/min. on the standard 2- speed machine.

2 - PREDISPOSITION FOR INVERTER (OPTIONAL)

Selects the blade cutting speed range: from 20 to 45 mt/min. for the 1st speed and from 35 to 90 mt/min. for the second speed. This model has been designed for the installation of a frequency converter (inverter) and is set up for both the electrical wiring and converter control potentiometer, which must be housed in the machine control panel.

3 - FLUID REFRIGERANT SELECTOR

Allows the selection of manual functioning with the gun, flow deactivation in zero position and automatic function, i.e. on starting- up of the belt motor the pump also starts- up.

4 - MANUAL OR SEMI-AUTOMATIC/DYNAMIC SELECTOR

Allows the selection of the functioning mode in manual or with CCS cycle (semi- automatic/dynamic).

5 - DISPLAY BELT TENSIONING

Visualises the tension of the belt in kg on the LCD display.

6 - EMERGENCY STOP MUSHROOM BUTTON

Pressing this button immediately stops machine operation. The emergency button, designed to conform to all safety standards, is positioned so that it is easily accessible at any time and is clearly visible - being a red button on a yellow background. To reset the emergency button, rotate actuator by 45°.

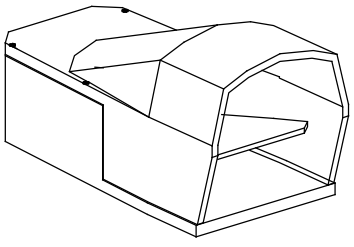
7 - CUTTING HEAD DESCENT SPEED ADJUSTER

Allows to adjust oil flow in the hydraulic cylinder to determine the cutting head descent speed.

8 - AUTOMATIC THERMAL-MAGNET CUTOUT WITH MINIMUM VOLTAGE RELAY AND HATCH LOCKING DEVICE

The machine is provided on the right of the control panel with a main switch with a locking device which, when set in the ON position (1), powers up the machine by resetting the minimum- voltage relay and the blade motor thermal magnet cutout. This device has three protection systems against power failure. When there is a power failure the electrical devices are all shut down, instantly shutting down the machine and preventing automatic restoring of power on power return. A further function is to reset the thermal relay, which protects against overcurrents.

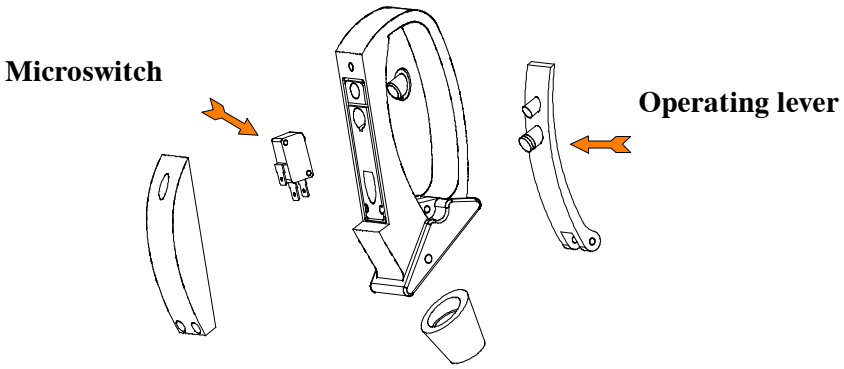
OPTIONAL PEDAL FOR VERSION WITH AUTOMATIC VICE (MA)



The foot pedal opens and closes the vice during normal machine operation.

HEAD CONTROL LEVER MICROSWITCH

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

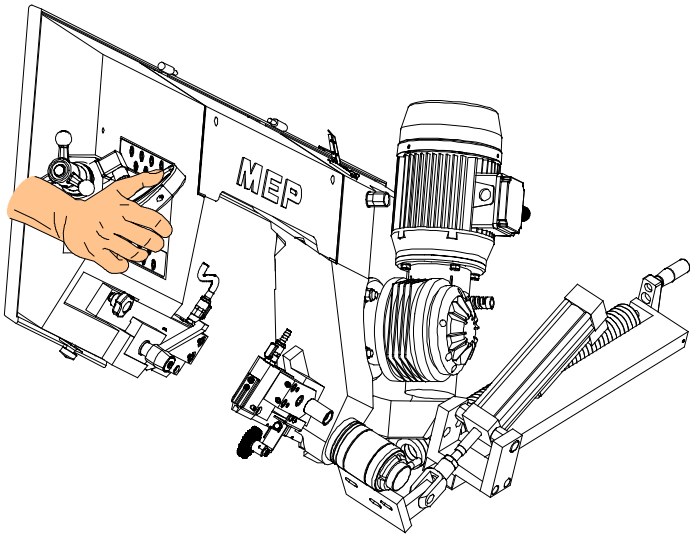


The microswitch is enabled when the machine is not in emergency state. In compliance with the relevant existing standards, voltage is 24V and the microswitch is installed in a housing (blue knob) sealed against external agents such as dust or moisture, with a protection rating of IP 55.

Basic instructions for carrying out a cutting operation cycle

Manoeuvring the cutting head

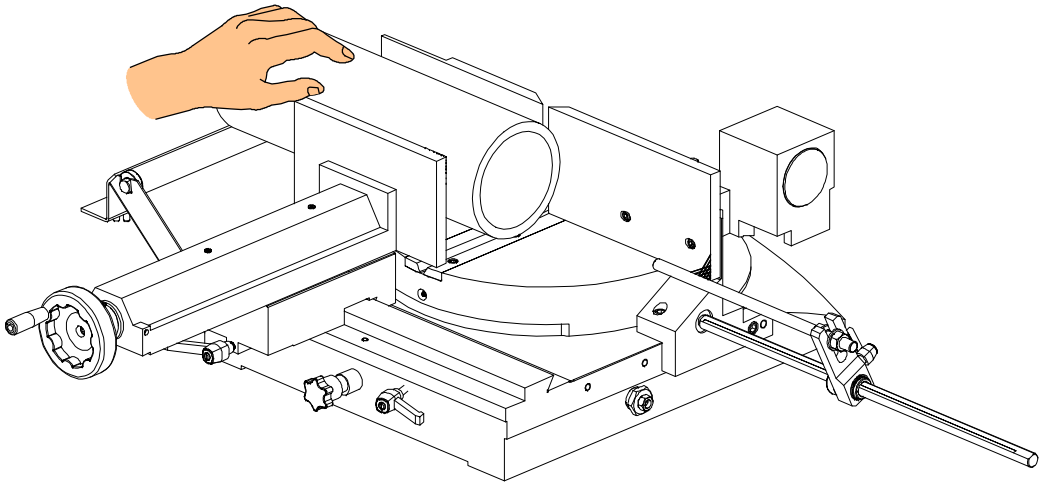
Manoeuvre of the cutting head is eased by the balancing of the optimal weight thanks to the tensile force of a spring positioned on the back of the machine. Also, the grip on the head control lever enables the operator to achieve a firm grip in order to start up band saw rotation by pressing the microswitch start lever, located in the handle itself.



Clamping the work piece in the vice

In the basic version, the work piece is clamped in the vice by rotating the opening/closing handwheel (in a clockwise/anticlockwise direction), as shown:

▶ each time the vice is closed make certain that the work piece is solidly clamped. This can be done manually.

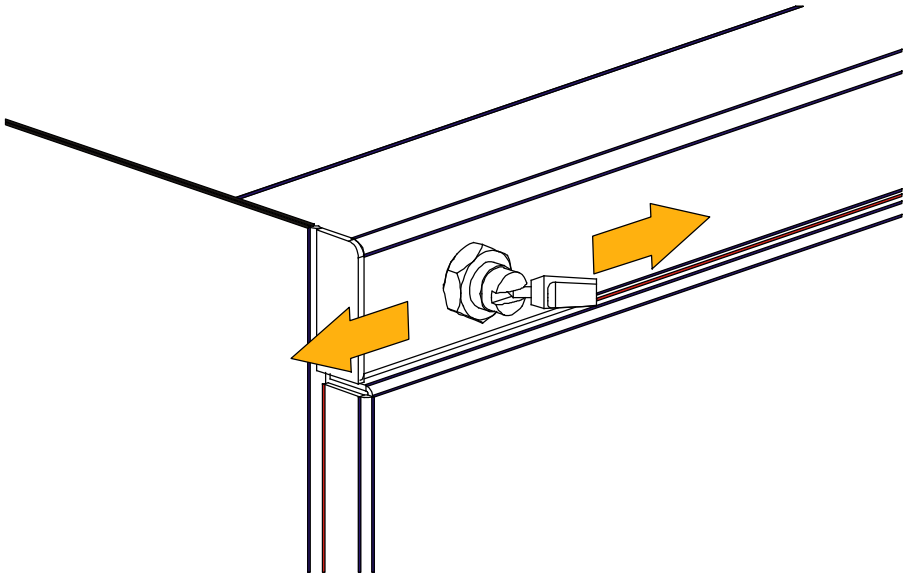


Clamping the work piece in the Automatic Vice (MA version)

If the machine is equipped with the Automatic Vice optional device (MA), the opening and closing of the vice is performed by means of the manual valve switch located on the base, which activates the vice pneumatic cylinder device. An optional pedal unit is available as an alternative to the manual valve.

▶ Near the vice to within 2- 3 mm from the work piece;

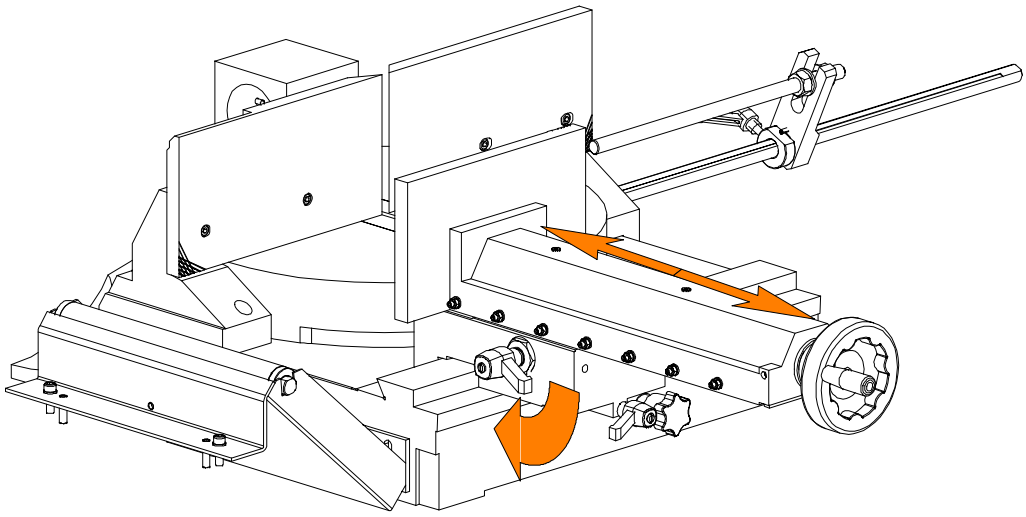
▶ close the vice using the manual valve situated on the base and make certain that the piece is tightly blocked. This can be done manually.



Rapid vice positioning

By means of a simple device the vice can be slid back and forth to accelerate vice opening and closing operations.

▶ Grip the lever illustrated in the figure below and rotate in a clockwise direction: the vice is now free to slide back and forth to the required position. Once positioned, release the lever to lock the vice in place.

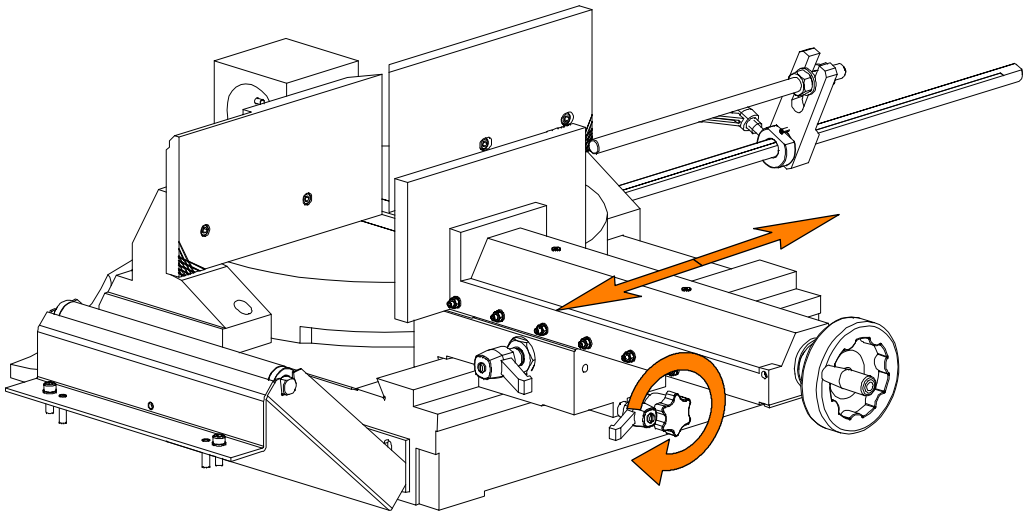


Rapid translation of the vice

For inclined cuts move the vice to the left or right, sliding it on the sliding guide.

▶ Loosen the locking lever as indicated in the figure;

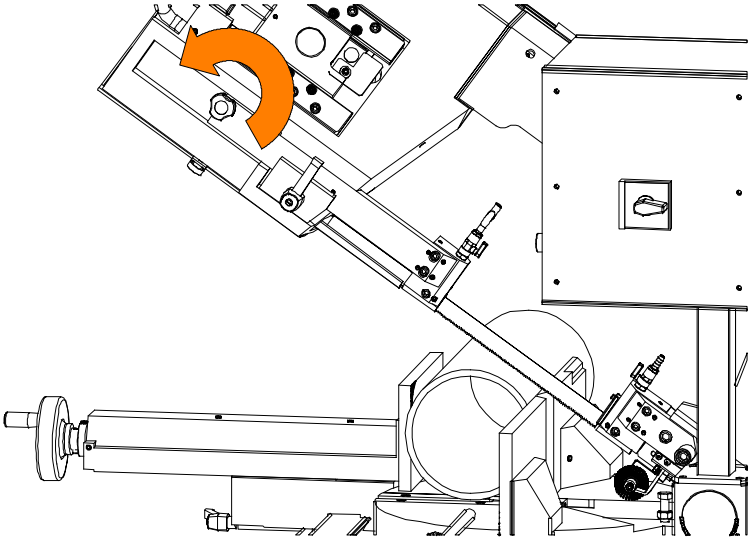
▶ position the vice to the right or left and tighten the locking lever;



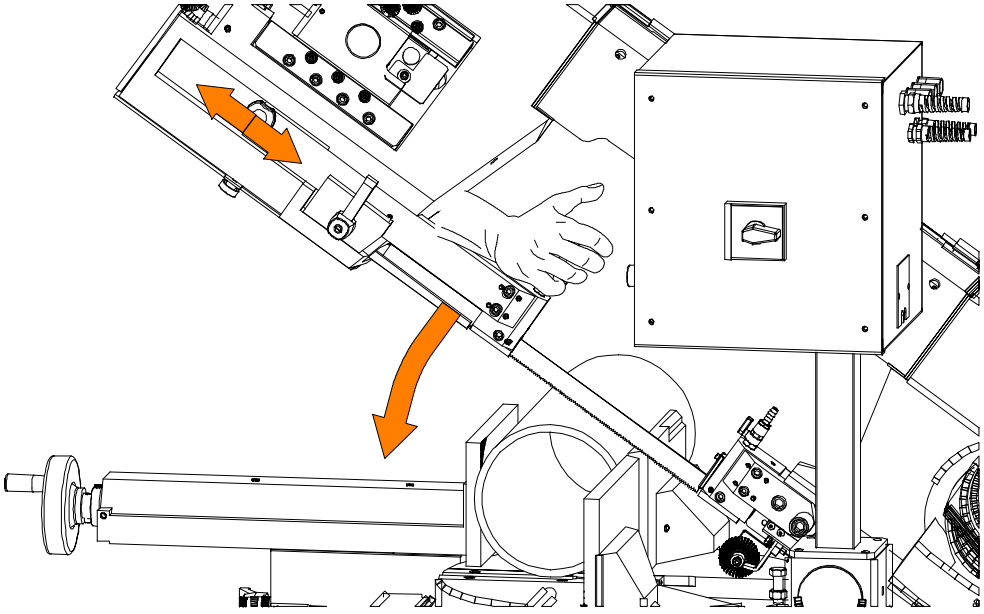
Width of cut

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

- ▶ Position the workpiece on the work table in proximity to the blade down-stroke trajectory and clamp it in the vice.
- ▶ loosen the ratchet lever on the sliding shaft of the front blade guide head;



- ▶ the mobile front guide head must be positioned near to the material, leaving the downstroke trajectory free to reach beyond the sliding vice jaw;



- ▶ Tighten the ratchet lever to lock the head slide.

Preliminary check list for cutting operation

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

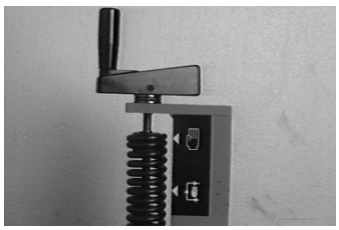
- blade tension;
- that the blade guide head bracket is locked in the correct position;
- that the cutting angle is correct and that the surface to be cut is blocked;
- that the work piece is properly clamped in place;
- that the blade teeth are correct for the job to be begun;
- that the speed selected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

Manual operating cycle

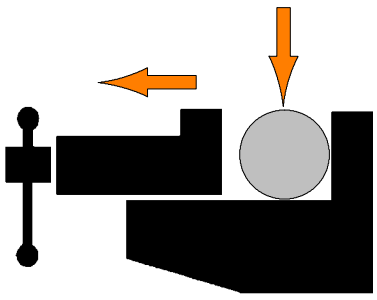
Sequence of operations for performing a cut:

- power up the machine by pressing the reset button;
- set the function selector on the manual cycle;

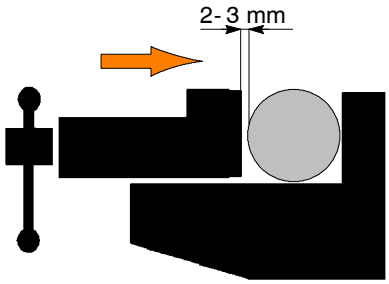
- set the cutting head recall spring in the manual position, aligning the first turn with the reference notch;



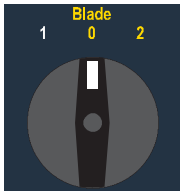
- position the workpiece in the vice and calculate the length of cut (using the measuring rod for cuts to measure).



▶ Clamp the workpiece in the vice; **if the machine is the MA version,** bring the vice manually to within 2- 3 mm. of the workpiece; tighten the vice using the special open/close button on the base or using the foot- pedal if equipped.

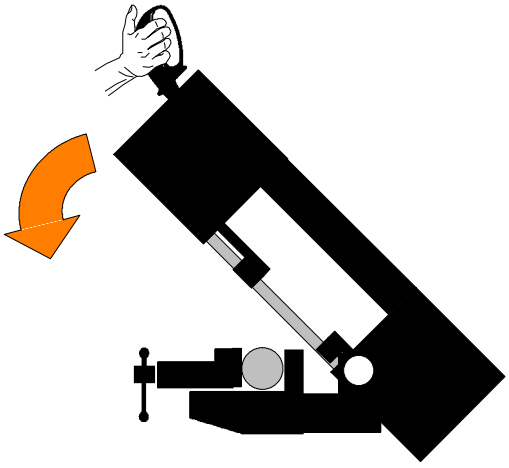


▶ Select the cut using the **polarity change switch** according to the type of the material to be cut (shape, thickness, hardness, etc.).

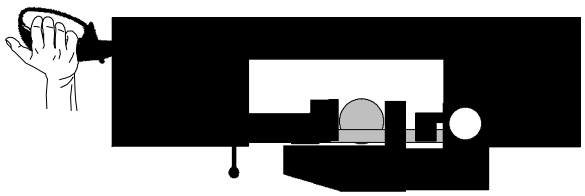


▶ Select the automatic functioning of the fluid refrigerant using the relevent selector.

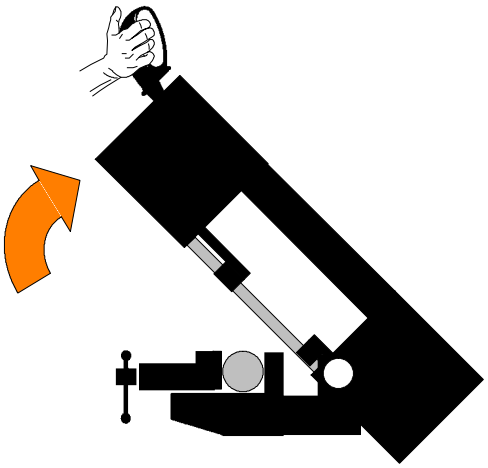
▶ Grip the head control lever and start the blade rotating by pressing the microswitch on the handgrip; the downstroke speed of the head is manually controlled by the operator.



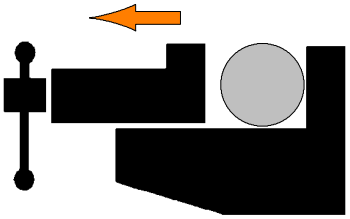
▶ The motor starts up and sets the blade in rotary motion; the lubricant/coolant pump starts up at the same time.



▶ At the end of the cutting operation, the head can be raised.



▶ Release the piece from the vice. For the MA version open the vice using the open/close selector, with the pedal board if the machine is equipped or manually using the vice hand wheel.

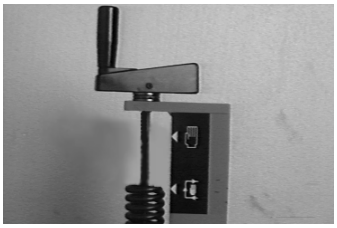


CCS (Cut Control System) functioning cycle

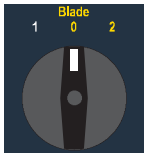
The Cut Control System allows to perform a Semi- automatic/Dynamic work cycle. Operation sequence to perform a cut in Semi- automatic/Dynamic:

- power up the machine by turning the main switch;
- set the function selector in semi- automatic/dynamic

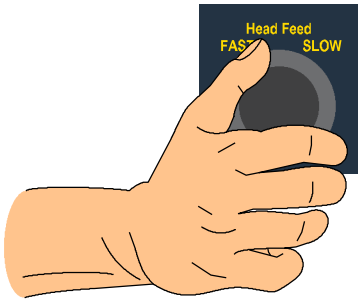
- set the cutting head recall spring in the semi- automatic/dynamic positionaligning the first turn with the reference notch:



- Position the material in the vice and calculate the cut lengths (using the measuring rod).
- Clamp the piece in the vice; **if the machine is the MA version**, bring the vice manually to within 2- 3 mm. of the workpiece; close the vice using the special open/close button on the base of the machine or using the footpedal if equipped on the machine.
- Select the cut speed using the Polarity change switch.



- Set the head downstroke speed on the hydraulic panel. located below the machine control panel, according to the characteristics of the material to be cut.



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

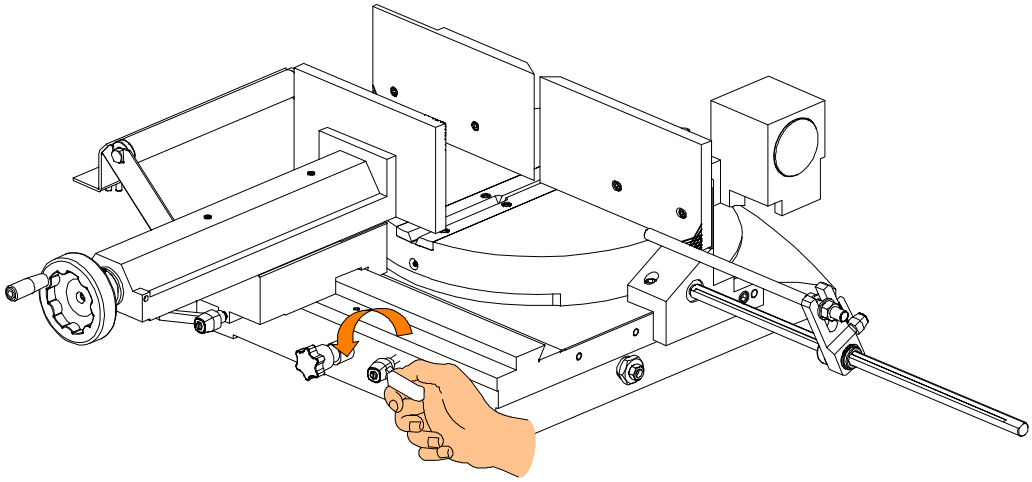
- The operating head will now perform cutting until it reaches FCTA (Head Downstroke Limit) at which point the motor will stop.

Angled cuts

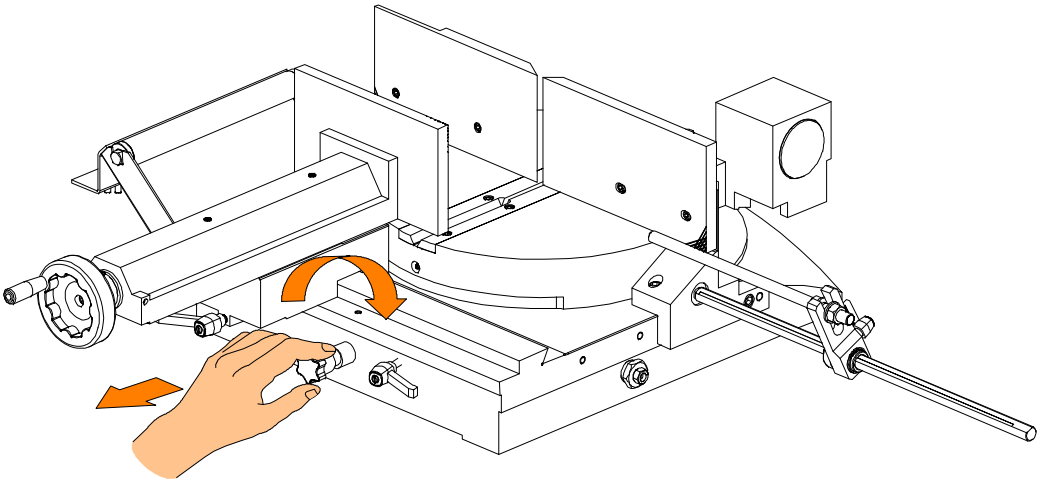
The machine can make angled cuts from 60° left to 45° right. Reference stops are mounted on the sides of the turntable to facilitate rapid 0°, 45° and 60° cuts to the left and 45° cuts to the right.

Angled cuts 45° to the left

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



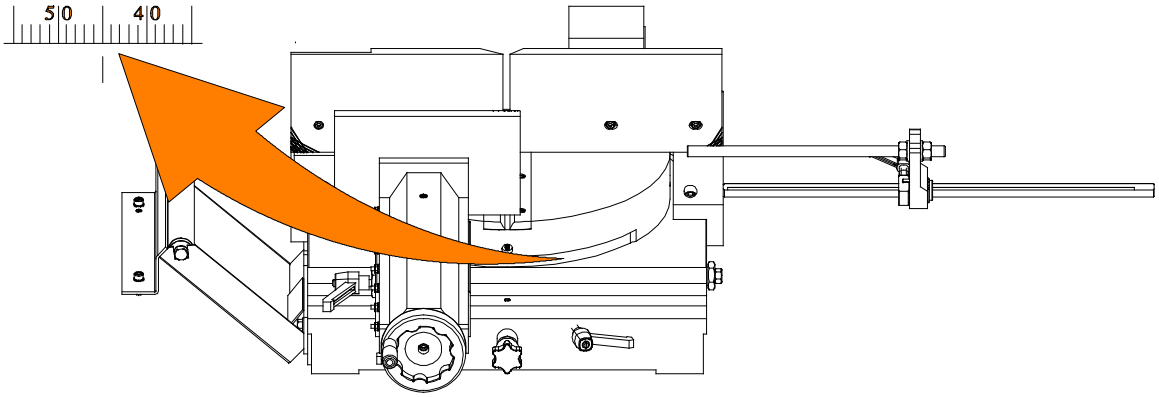
- ▶ Pull the eccentric pin knob towards you (0° reference stop) and rotate slightly to raise it.



Warning

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

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



Attention

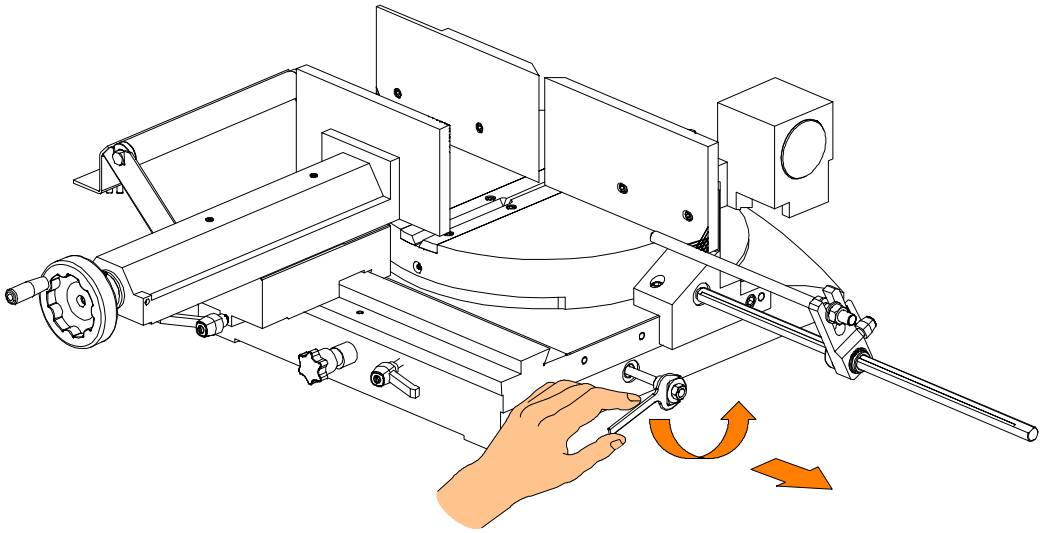
Always rotate the head when it is in the upper position to avoid blade collision with the moving jaw on the clamp.

▶ Relock the turntable lock/release lever.

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

Angled cuts 60° to the left

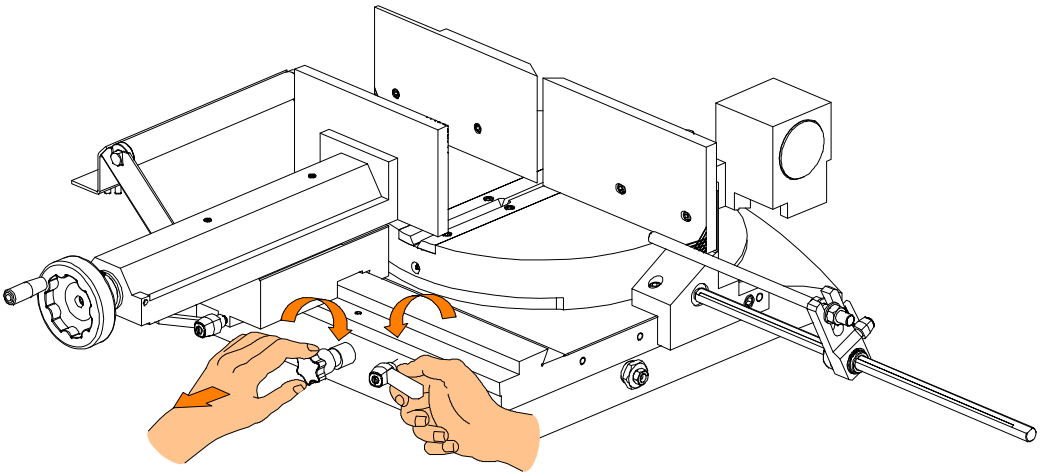
▶ Undo the bush on the 45° left reference stop, as illustrated in the figure below, using a 36 mm wrench;



▶ Remove the 45° reference stop;

▶ slacken the turntable lock/release lever;

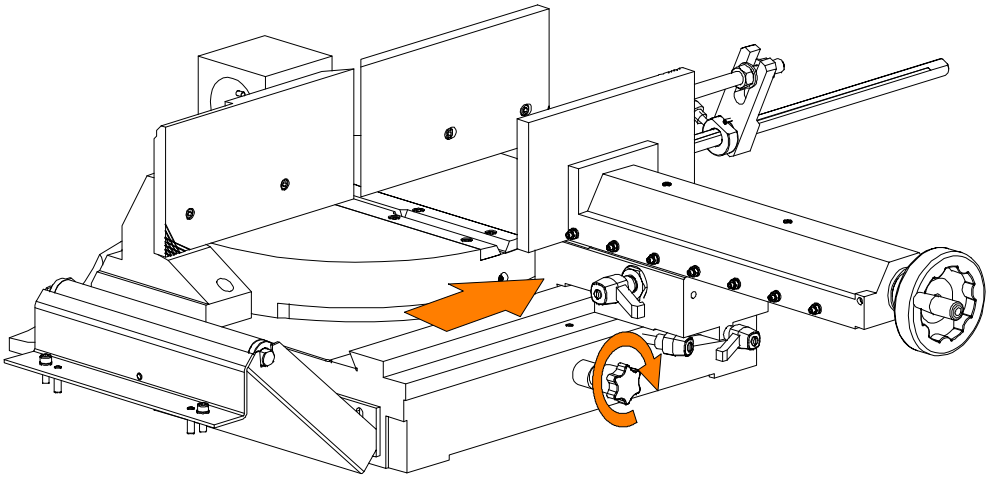
- pull the eccentric pin knob towards you (0° reference stop) and rotate slightly to raise it;



- swing the head from left to right until it is positioned at the required angle, as indicated by the graduated scale on the turntable;
- relock the turntable lock/release lever.
- Before cutting, remove the lever from the front head support and replace it with the grub screw in the accessory pack.
- Make the cut in the required operating mode, following the preliminary safety instructions set out in this chapter.

Angled cuts 45° to the right

- ▶ Make sure the vice is positioned to the right of the 0° cutting slot.
- ▶ slacken the locking lever as shown in the figure below;
- ▶ position the vice to the right and lock the lever.

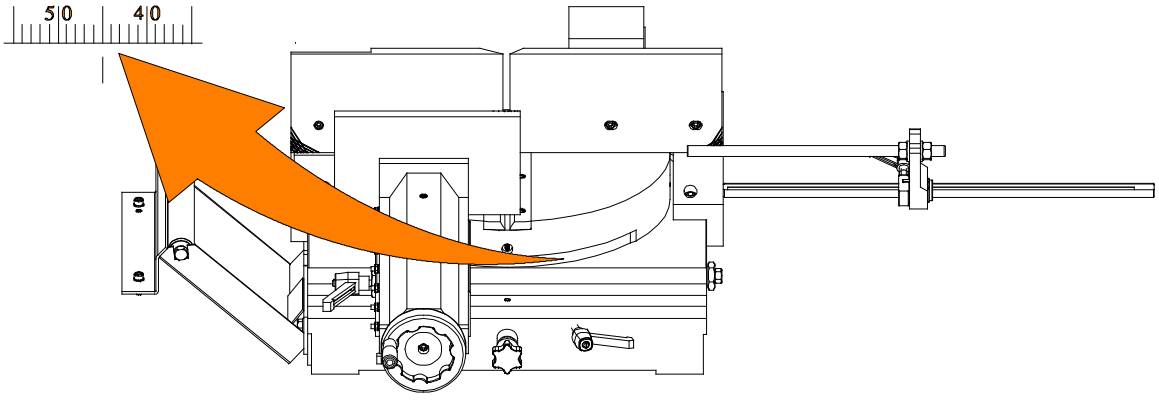


Attention

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

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

- ▶ slacken the turntable lock/release lever;
- ▶ pull the eccentric pin knob towards you (0° reference stop) and rotate slightly to raise it;



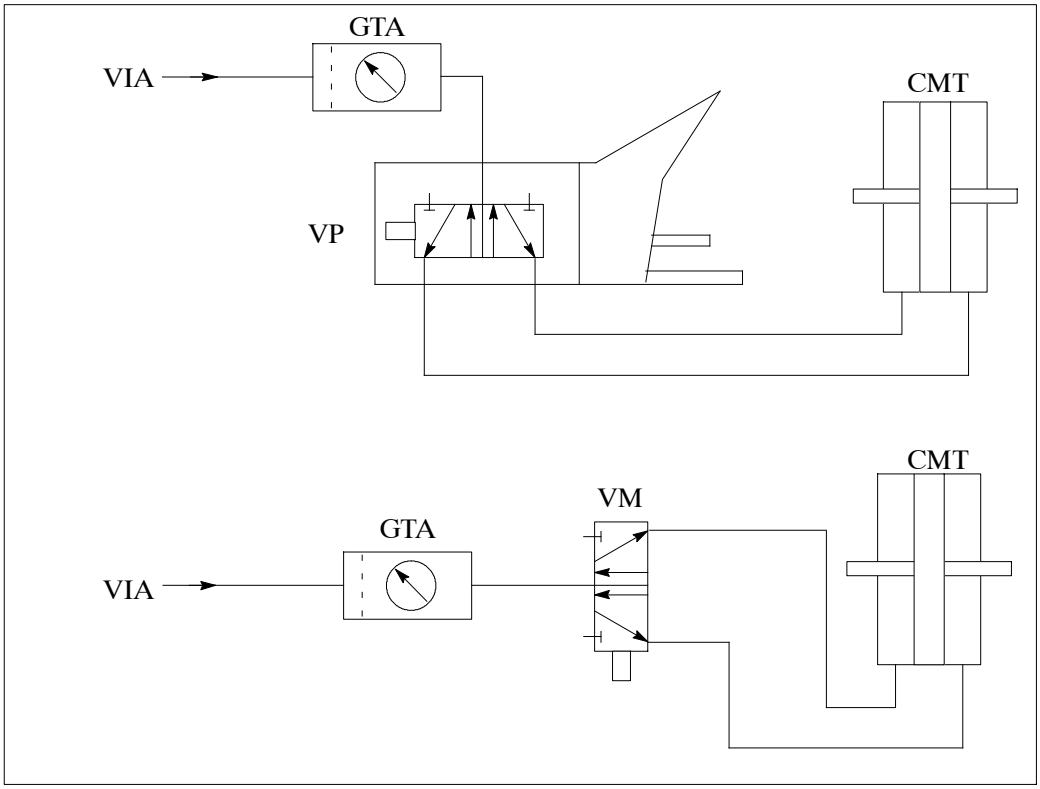
- ▶ swing the head from left to right until it is positioned at the required angle, as indicated by the graduated scale on the turntable;
- ▶ relock the turntable lock/release lever;
- ▶ make the cut in the required operating mode, following the preliminary safety instructions set out in this chapter.

Diagrams, exploded views and replacement parts

6

This chapter contains functional diagrams and exploded views of the **DM12**, including the MA version. 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)



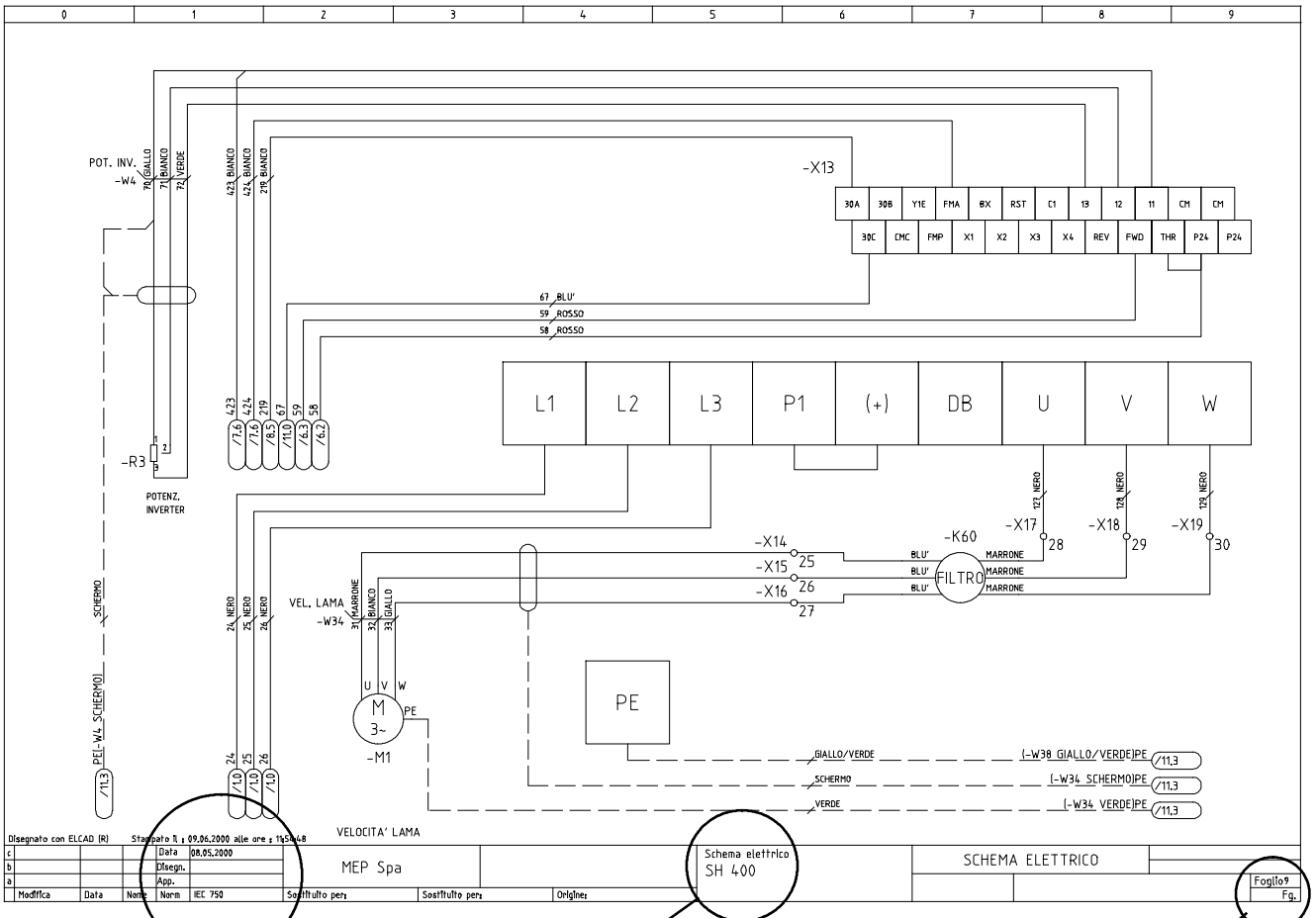
Pneumatic components key					
VIA	Air inlet valve	VP	Pedal valve	CMT	Cutter vice cylinder
GTA	Air treatment unit	VM	Manual valve	CPT	Head holder cylinder

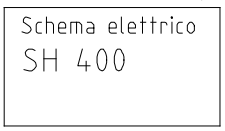
How to read the wiring diagrams

With the introduction of the new standardised wiring diagrams, the following gives an illustration of the way in which they have been drawn up.

Each sheet of the project contains a box which gives the following information:

The numbers indicate the columns into which the entire drawing is divided





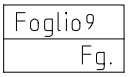
Indications of the model of machine

Data	08.05.2000
Disegn.	MARIO ROSSI
App.	
Norm	IEC 750

Indications of the date production started

Identification of the designer

Identification of the Reference Standard

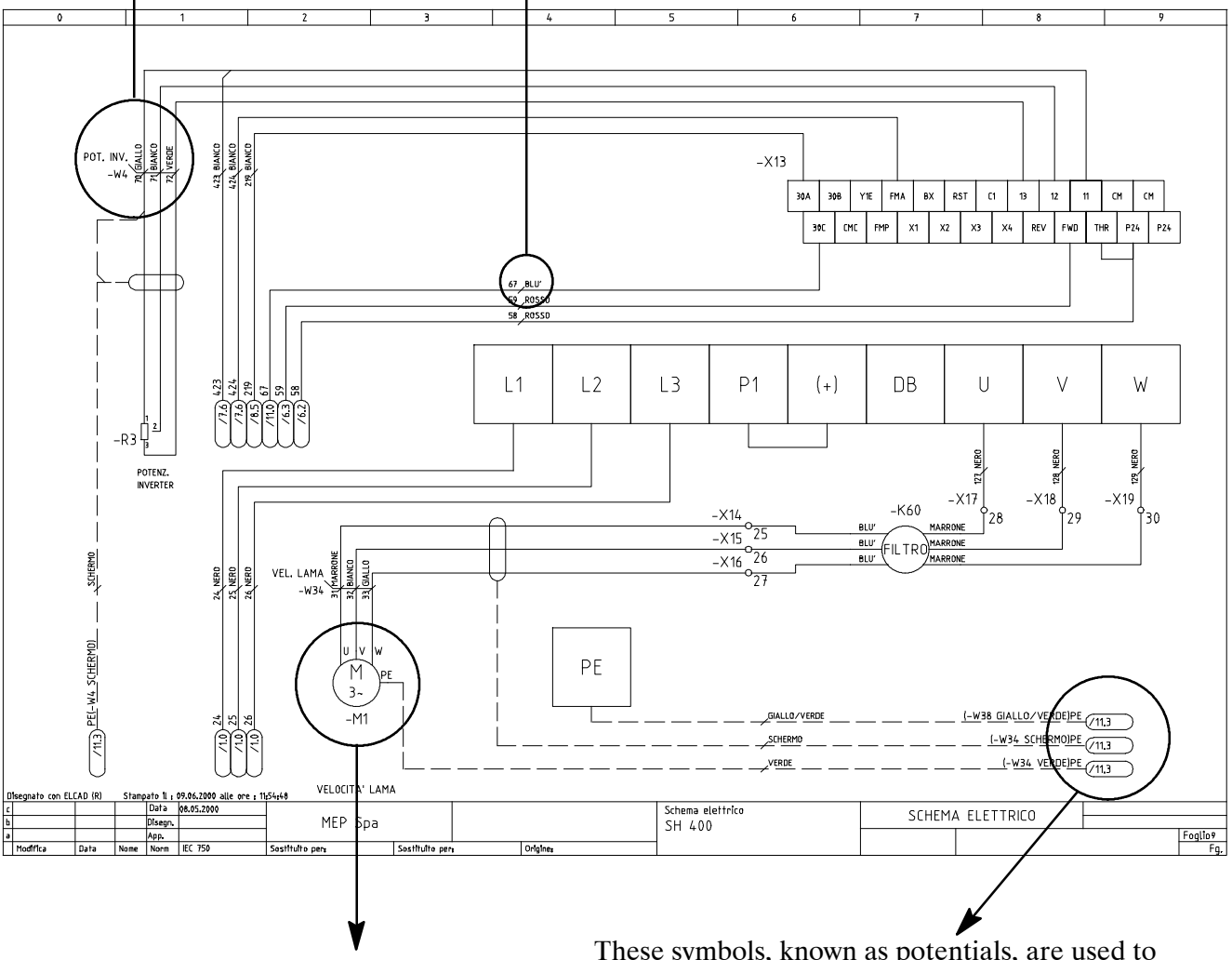


Indication of the page number

Each component in the wiring diagram is identified by a unique alphanumeric identification code, in compliance with regulations:

The wire is identified by the code - W4

This symbol identifies the wire with its relative number and colour



The motor is identified by the code - M1

These symbols, known as potentials, are used to provide page references: the first number indicates the page to be referred to, the second number, after the dot, identifies the column on that page; example /11.8 indicates that the wire continues on page no. 11 in column 8

The pages following the wiring diagrams contain the following lists:

1. components list (list of all components) and terminals list (list of all the terminals) with the following information:
   - in- house article code;
   - identification code;
   - reference, no. of the page and column on which it can be found;
   - description;
   - manufacturer.

ART. COD.	ID	PRES. REF	DESCRIPTION	MANUFACTURER
022.2151	- B1	/5.2	STRAIN GAUGE	DELTATEC

2. wires list (list of all wires) with the following information:
   - in- house article code;
   - identification code;
   - description;
   - section of wire (mm2);
   - colour of wire;
   - start: indicates the component (identification code and contact number) at which the wire starts;
   - end: indicates the component (identification code and contact number) at which the wire ends; e.g.

CODE	CABLE	DESCRIPTION	SECTION	NO.	COLOUR	START		END	
022.0141	- W7	RESET+EMER-GENZA	0.50	317	BIANCO	- S3	4	- K10	14

In this example, wire no. 317 white, identified as - W7, starts from contact no. 4 on component - S3, and ends at contact no. 14 on component - K10.
Enclosed below is Appendix D2 to European Standard EN 60204- 1

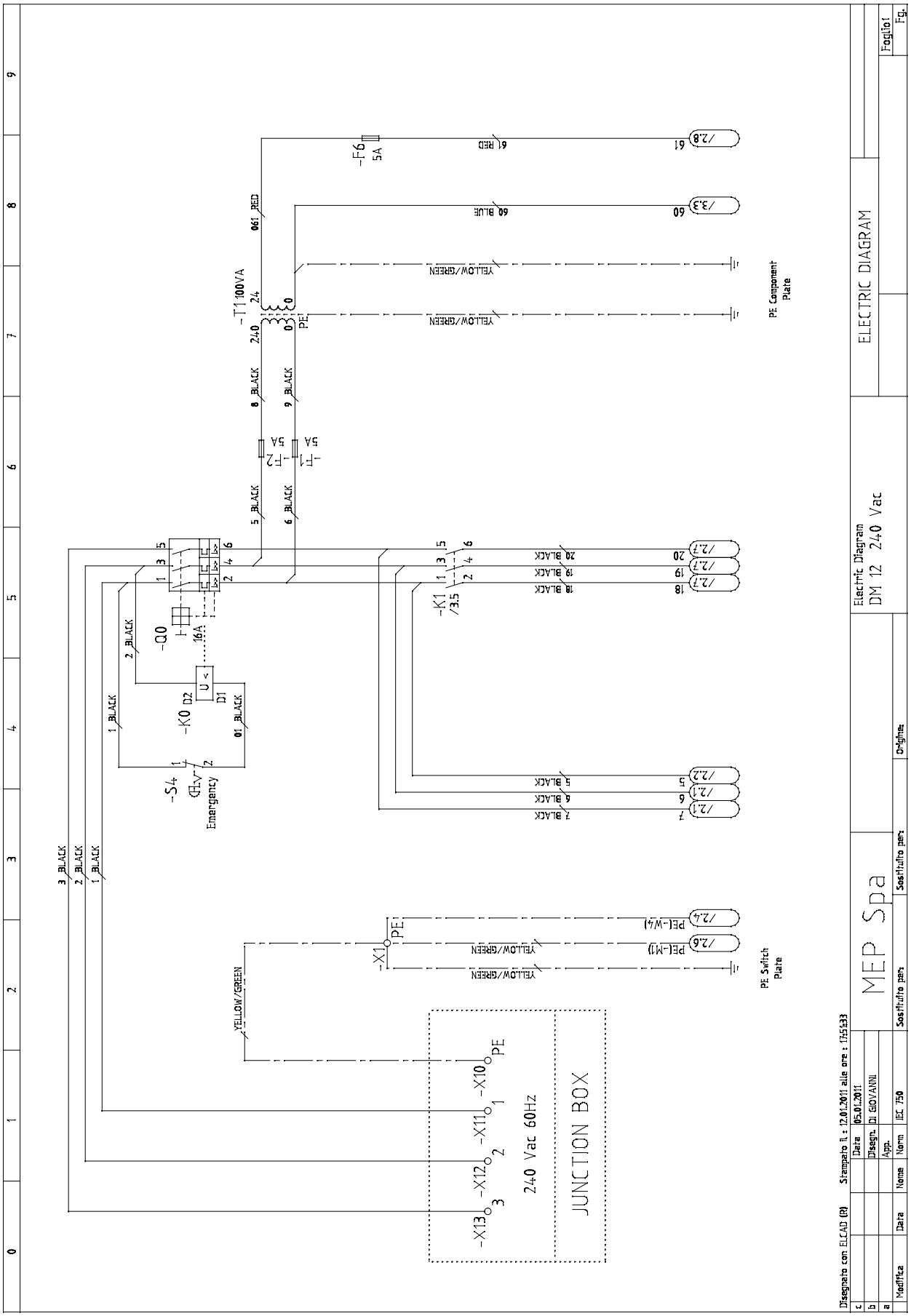
D2- Letter codes used to designate the type of component

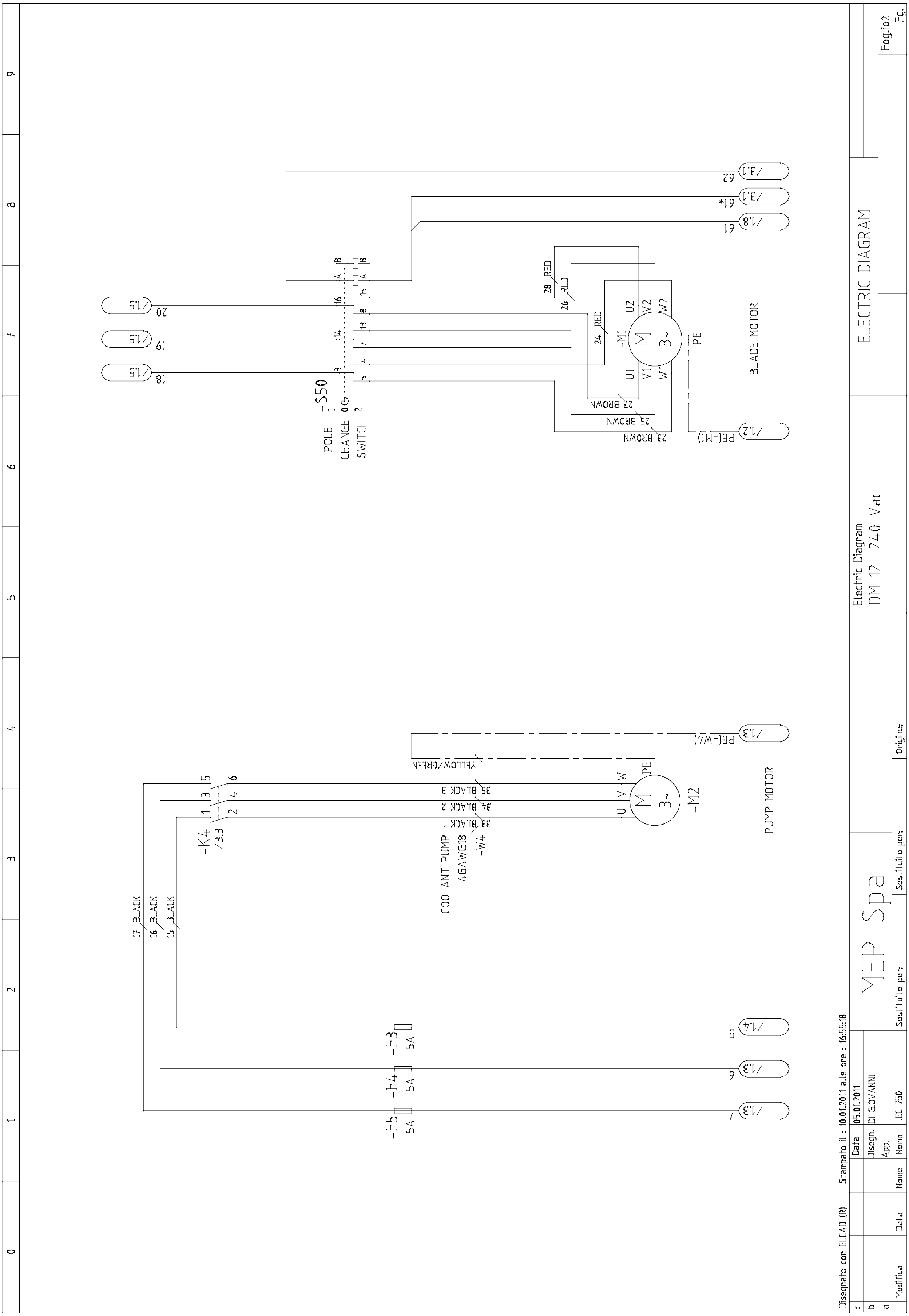
LETTER	TYPE OF COMPONENT	EXAMPLES	IDENTIFICATION OF THE APPLIANCE
A	Complex units	Laser Maser Regulator	A
B	Transducers converting a non electrical signal to an electrical signal and vice versa	Transistor amplifier IC amplifier Magnetic amplifier Valve amplifier Printed circuit board Drawer Rack	AD AJ AM AV AP AT AR
C	Capacitors		C
D	Binary operators, timing devices, storage devices	Digital integrated circuits and devices: Delay line Bistable element Monostable element Recorder Magnetic memory Tape or disk recorder	D
E	Various materials	Devices not specified in this table	E
F	Protective Devices	Lightning protectors Arrestors	F
		Instant action current threshold protector Delayed action current threshold protector Instant and delayed action current threshold protector Fuse Voltage threshold protector	FA FR FS FU FV

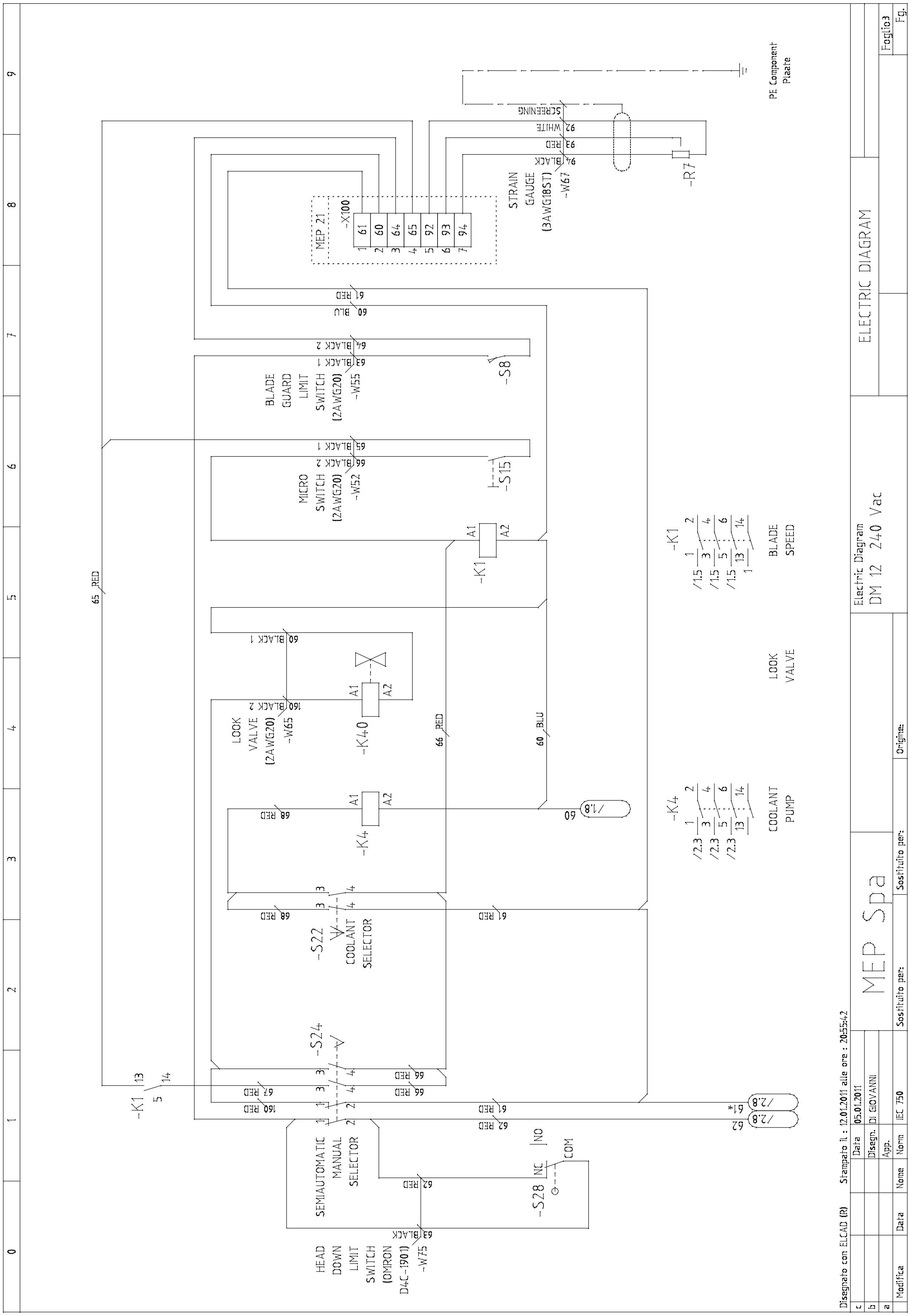
LETTER	TYPE OF COMPONENT	EXAMPLES	IDENTIFICATION OF THE APPLIANCE
G	Generators, feeders	Rotating generators Crystal oscillators	G
		Accumulator battery Rotating or static frequency converter Power feeder	GB GF GS
H	Signaling Devices	Buzzer Optical signal, indicator light device	HA HL
J			
K	Relays, Contactors	Instant all or nothing relays or instant contactors Bistable relays or interdependent contactors (All or nothing contactors with mechanical contact or permanent magnet etc.) Contactors Polarised relays Reed relays All or nothing timed relays (timers)	KA KL KM KP KR KT
L	Inductors, reactors	Inductor Stop coil Reactor	L
M	Motors		M
N	Analogue intgrated circuits	Operational amplifiers Hybrid analog/digital appliances	N
P	Measurement equipment, test devices	Indicator, recorder and integrator measurement devices Signal generators	P
Q	Power circuit switching appliances	Automatic switch Engine saver switch Knife switch	QF QM QS
R	Resistors	Fixed or variable resistor (rheostat)	R
S	Command or control devices	Selector or switch Button (including electronic proximity switch) Numerical all or nothing sensors (single step) of mechanical and electronic type: - Liquid level sensor - Pressure sensor Position sensor (including proximity) - Rotation sensor - Temperature probe	SA SB SL SP SQ SR ST

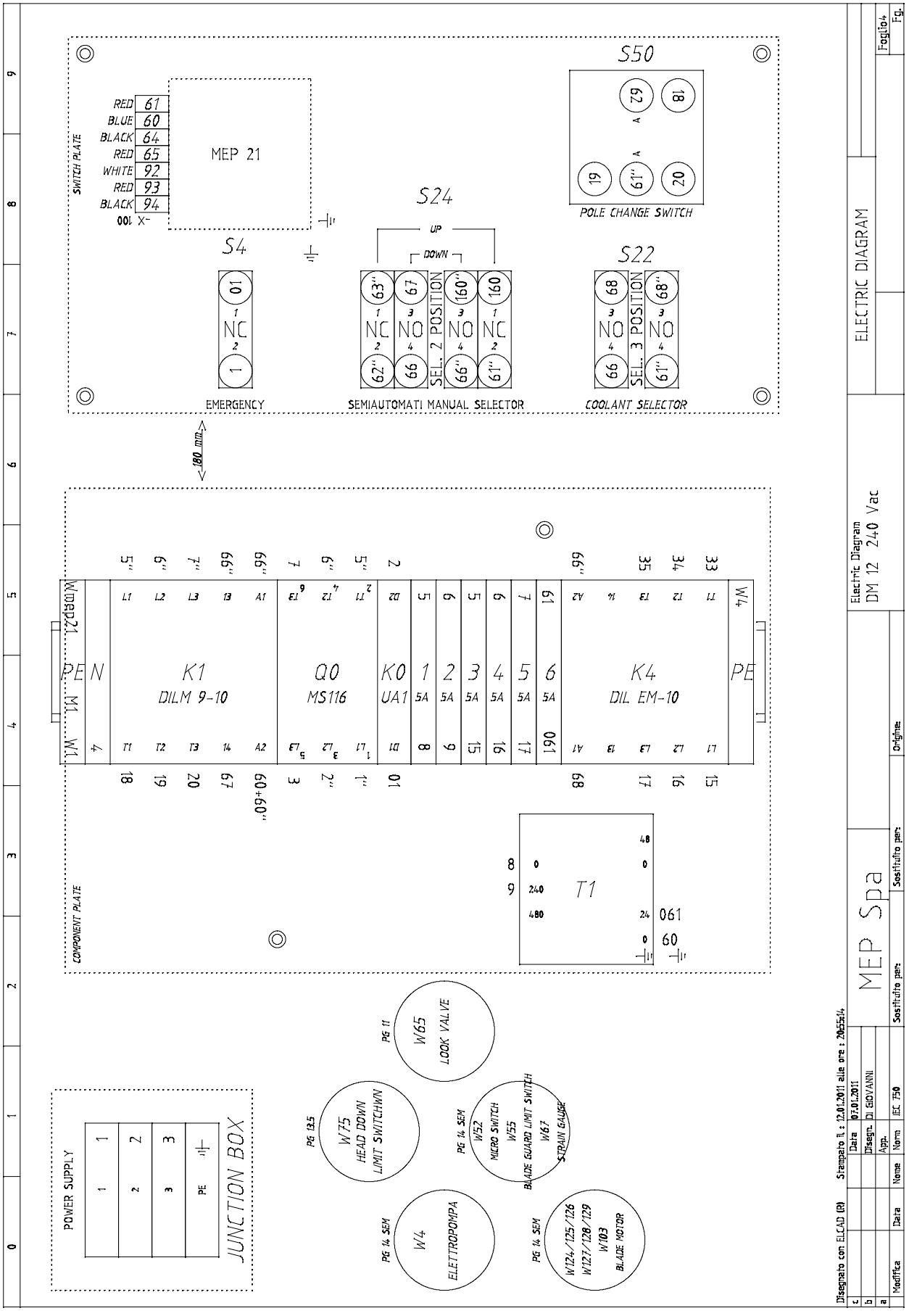
LETTER	TYPE OF COMPONENT	EXAMPLES	IDENTIFICATION OF THE APPLIANCE
T	Transformers	Current transformer Control circuit supply transformer Power transformer Magnetic stabiliser Voltage transformer	TA TC TM TS TV
U	Modulators, converters	Discriminator Demodulator Frequency converter Coder Converter Inverter Telegraphic repeater	U
V	Electronic pipes, semiconductors	Electronic pipe Gas discharge pipe Diode Transistor Thyristor	V
W	Transmission lines, wave guides, antennas	Conductor Cable Bar Wave guide Wave guide directional coupler Dipole Parabolic antenna	W
X	Terminals, sockets, plugs	Connector bar Test plug Plug Socket Terminal connector band	XB XJ XP XS XT
Y	Electrically operated mechanical appliances	Electromagnet Electromagnetic brake Electromagnetic clutch Magnetic table spindle Electromagnetic valve	YA YB YC YH YV
Z	Transformers, impedence adapters, equalizers, band limiters	Line equalizer Compresser Crystal filter	Z

Standardised Wiring Diagrams 240 Vac




ELECTRIC DIAGRAM
Electric Diagram
DM 12 240 Vac
MEP Spa
BLADE MOTOR
PUMP MOTOR
POLE CHANGE SWITCH
-S50
-M1
-M2
-K4
/3.3
COOLANT PUMP
4GAWG18
-W4
-F3
-F4
-F5
5A
YELLOW/GREEN
PE(-M1)
PE(-W4)
Disegnato con ELCAD (R)
Stampato il : 10.01.2011 alle ore : 16:55:18
Data 05.01.2011
Disegn. DI GIOVANNI
App.
Norm IEC 750
Modifica
Data
Nome
Sostituito per:
Sostituito da:
Origine:
Foglio2
Fg.


ELECTRIC DIAGRAM
Electric Diagram DM 12 240 Vac
MEP Spa
Disegnato con ELCAD (R)
Stampato il : 12.01.2011 alle ore : 20:55:42
Data 05.01.2011
Disegn. DI GIOVANNI
App.
Norm IEC 750
Modifica Data Nome
Sostituito per:
Sostituito per:
Origine:
Foglio3
Fg.
PE Component Plaate
SCREENING
92 WHITE
93 RED
94 BLACK
-R7
STRAIN GAUGE (3AWG18ST) -W67
MEP 21
-X100
61 60 64 65 92 93 94
61 RED
60 BLU
64 BLACK 2
63 BLACK 1
BLADE GUARD LIMIT SWITCH (2AWG20) -W55
-S8
65 BLACK 1
66 BLACK 2
MICRO SWITCH (2AWG20) -W52
-S15
-K1
A1 A2
-K1
/1.5 /1.5 /1.5
BLADE SPEED
65 RED
60 BLACK 1
160 BLACK 2
LOOK VALVE (2AWG20) -W65
-K40
A1 A2
LOOK VALVE
66 RED
60 BLU
-K4
A1 A2
68 RED
60 /1.8
-K4
/2.3 /2.3 /2.3
COOLANT PUMP
68 RED
61 RED
-S22
COOLANT SELECTOR
-S24
66 RED
-K1
13 14 5
67 RED
160 RED
61 RED
62 RED
61* /2.8
62 /2.8
SEMIAUTOMATIC MANUAL SELECTOR
NO NC COM
-S28
62 RED
63 BLACK
HEAD DOWN LIMIT SWITCH (OMRON D4C-1901) -W75


SWITCH PLATE
RED 61
BLUE 60
BLACK 64
RED 65
WHITE 92
RED 93
BLACK 94
001 X-
MEP 21
S50
POLE CHANGE SWITCH
S24
UP
DOWN
S4
S22
EMERGENCY
SEMIAUTOMATI MANUAL SELECTOR
COOLANT SELECTOR
SEL. 2 POSITION
SEL. 3 POSITION
180 mm
COMPONENT PLATE
K1
DILM 9-10
Q0
MS116
K0
UA1
K4
DIL EM-10
T1
PE
PEN
POWER SUPPLY
JUNCTION BOX
W65
LOOK VALVE
W75
HEAD DOWN
LIMIT SWITCHWN
W52
MICRO SWITCH
W55
BLADE GUARD LIMIT SWITCH
W67
STRAIN GAUGE
W4
ELETTROPOMPA
W124-/125-/126
W127-/128-/129
W103
BLADE MOTOR
MEP Spa
ELECTRIC DIAGRAM
Electric Diagram
DM 12 240 Vac
Foglio4
Fg.
Disegnato con ELCAD (R)
Stampato il : 12.01.2011 alle ore : 20:25:14
Data 07.01.2011
Disegn. Di GIOVANNI
Appr.
Norm IEC 750
Sostituito pers.
Origine
Modifica
Data
Nome

List of cables

Code	ID	Description	Nr.	Colour	Start	End
022.0225	-W4	COOLANT PUMP	33	BLACK 1	-K4:T1	-M2:U
022.0225	-W4	COOLANT PUMP	34	BLACK 2	-K4:T2	-M2:V
022.0225	-W4	COOLANT PUMP	35	BLACK 3	-K4:T3	-M2:W
022.0225	-W4	COOLANT PUMP		YELLOW/GREEN	-X1:PE	-M2:PE
022.0139	-W52	MICRO SWITCH	65	BLACK 1	-K1:13	-S15
022.0139	-W52	MICRO SWITCH	66	BLACK 2	-K1:A1	-S15
022.0139	-W55	BLADE GUARD L/S	63	BLACK 1	-S24:1	-S8
022.0139	-W55	BLADE GUARD L/S	64	BLACK 2	-XMEP 21:3	-S8
022.0139	-W65	LOOCK VALVE	60	BLACK 1	-K1:A2	-K40:A2
022.0139	-W65	LOOCK VALVE	160	BLACK 2	-S24:3	-K40:A1
022.0224	-W67	STRAIN GAUGE	92	WHITE	-XMEP 21:5	-R7
022.0224	-W67	STRAIN GAUGE	93	RED	-XMEP 21:6	-R7
022.0224	-W67	STRAIN GAUGE	94	BLACK	-XMEP 21:7	-R7
022.0224	-W67	STRAIN GAUGE		SCREENING	-PE:SW PLA-TE	
022.0506	-W75	HEAD DOWN L/S	35	BLACK	-S24:1	-S28
022.0506	-W75	HEAD DOWN L/S	36	RED	-S24:2	-S28
022.0134Y/G	-W100	T1:0 VAC(0-24)/PE		YELLOW/GREEN	T1:0(0-24V)	PE
022.0134Y/G	-W101	X1:PE/PE:SW.PLATE		YELLOW/GREEN	-X1:PE	PE
022.0134Y/G	-W102	X1:PE/M1:PE		YELLOW/GREEN	-X1:PE	-M1:PE
022.0134Y/G	-W103	X10:PE/X1:PE		YELLOW/GREEN	-X10:PE	-X1:PE
022.0134B	-W104	X11:1/Q0:1	1	BLACK	-X11:1	-Q0:1
022.0134B	-W105	X12:2/Q0:3	2	BLACK	-X12:2	-Q0:3
022.0134B	-W106	X13:3/Q0:5	3	BLACK	-X13:3	-Q0:5
022.0134B	-W107	S4:1/Q0:1	1	BLACK	-S4:1	-Q0:1
022.0134B	-W108	K0:D2/Q0:3	2	BLACK	-K0:D2	-Q0:3
022.0134B	-W109	S4:2/K0:D1	01	BLACK	-S4:2	-K0:D2
022.0134B	-W110	Q0:2/F1	5	BLACK	-Q0:2	-F1
022.0134B	-W111	Q0:2/K1:1	5	BLACK	-Q0:2	-K1:1
022.0134B	-W112	K1:1/F3	5	BLACK	-K1:1	-F3
022.0134B	-W113	Q0:4/F2	6	BLACK	-Q0:4	-F2
022.0134B	-W114	Q0:4/K1:3	6	BLACK	-Q0:4	-K1:3
022.0134B	-W115	K1:3/F4	6	BLACK	-K1:3	-F4
022.0134B	-W116	Q0:6/K1:5	7	BLACK	-Q0:6	-K1:5
022.0134B	-W117	K1:5/F5	7	BLACK	-K1:5	-F5
022.0134B	-W118	F1/T1:0(0-240)	8	BLACK	-F1	-T1:0(0-240)
022.0134B	-W119	F2/T1:240(0-240)	9	BLACK	-F2	-T1:240(0-240)
022.0134B	-W120	K1:2/S50:3	18	BLACK	-K1:2	-S50:3
022.0134B	-W121	K1:4/S50:14	19	BLACK	-K1:4	-S50:14
022.0134B	-W122	K1:6/S50:14	20	BLACK	-K1:6	-S50:16
022.0134B	-W123	F3/K4:1	15	BLACK	-F3	-K4:1
022.0134B	-W124	F4/K4:3	16	BLACK	-F4	-K4:3
022.0134B	-W125	F5/K4:5	17	BLACK	-F5	-K4:5
022.0134BR	-W126	S50:5/M1:W1	23	BROWN	-S50:5	-M1:W1
022.0134BR	-W127	S50:7/M1:V1	25	BROWN	-S50:7	-M1:V1
022.0134BR	-W128	S50:8/M1:U1	27	BROWN	-S50:8	-M1:U1
022.0134R	-W129	S50:4/M1:W2	24	RED	-S50:4	-M1:W2
022.0134R	-W130	S50:13/M1:U2	26	RED	-S50:13	-M1:V2
022.0134R	-W131	S50:15/M1:U2	28	RED	-S50:15	-M1:U2

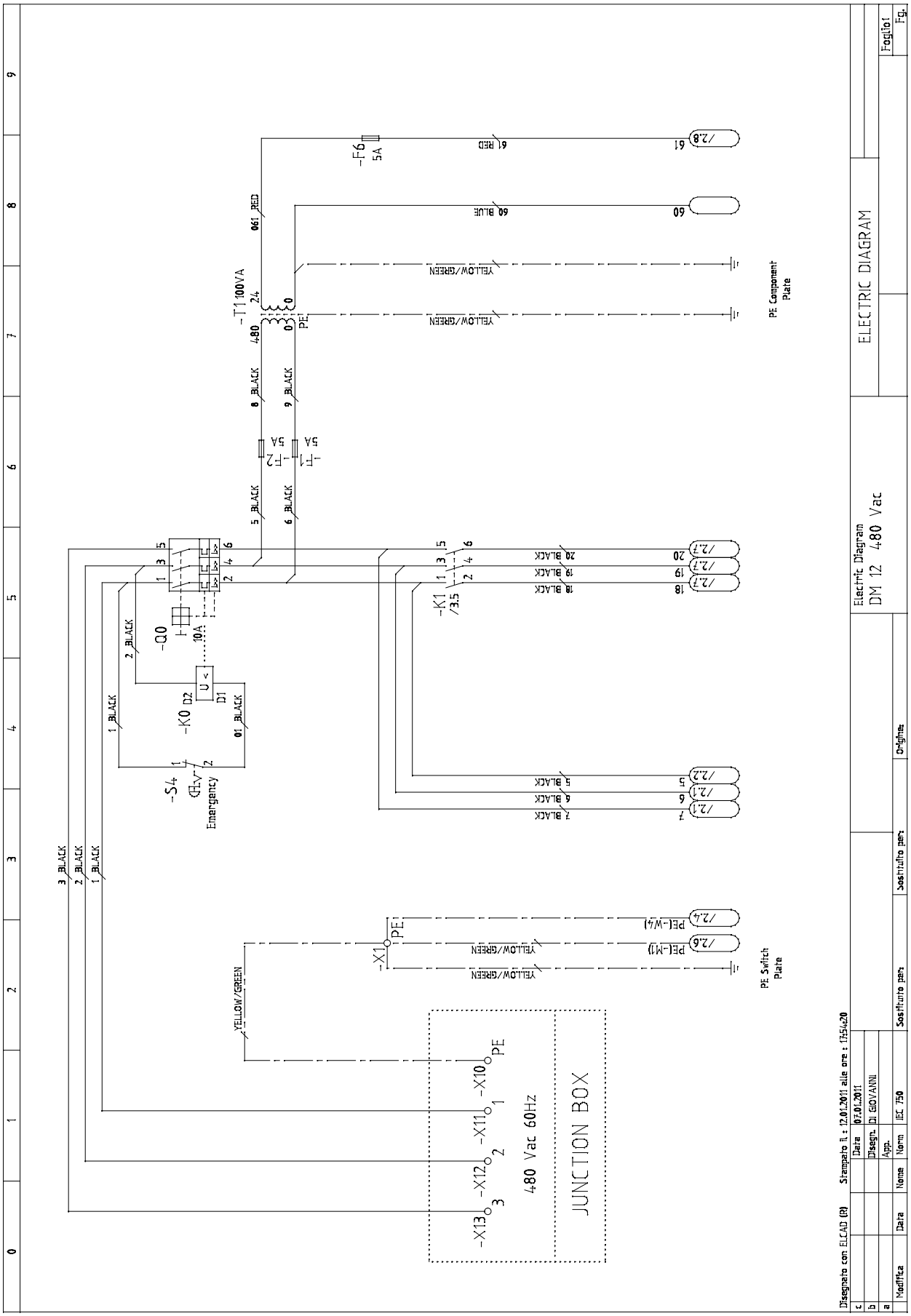
022.0133BL	-W150	T1:0(0-24)/K4:A2	60	BLUE	-T1:0(0-24)	-K4:A2
022.0133BL	-W151	K4:A2/K1:A2	60	BLUE	-K4:A2	-K1:A1
022.0133BL	-W152	K1:A2/X MEP21:2	60	BLUE	-K1:A1	-X MEP21:2
022.0133R	-W160	T1:24(0-24)/F6	061	RED	-T1:24(0-24)	-F6
022.0133R	-W161	F6/S50:A	61	RED	-F6	-S50:A
022.0133R	-W162	S50:A/S24:2	61	RED	-S50:A	-S24:2
022.0133R	-W163	S24:2/S22:4	61	RED	-S24:2	-S22:4
022.0133R	-W164	S22:4/X MEP21:1	61	RED	-S22:4	-X MEP21:1
022.0133R	-W165	S50:A/S24:2	62	RED	-S50:A	-S24:2
022.0133R	-W166	K1:13/X MEP21:4	62	RED	-K1:13	-X MEP21:4
022.0133R	-W167	S24:4/S24:4	66	RED	-S24:4	-S24:4
022.0133R	-W168	S24:4/S22:4	66	RED	-S24:4	-S22:4
022.0133R	-W169	S22:4/K1:A1	66	RED	-S22:4	-K1:A1
022.0133R	-W170	K1:14/S24:3	67	RED	-K1:14	-S24:3
022.0133R	-W171	S22:3/S22:3	68	RED	-S22:3	-S22:3
022.0133R	-W172	S22:3/K4:A1	68	RED	-S22:3	-K4:A1
022.0133R	-W173	S24:3/S24:3	160	RED	-S24:3	-S24:3

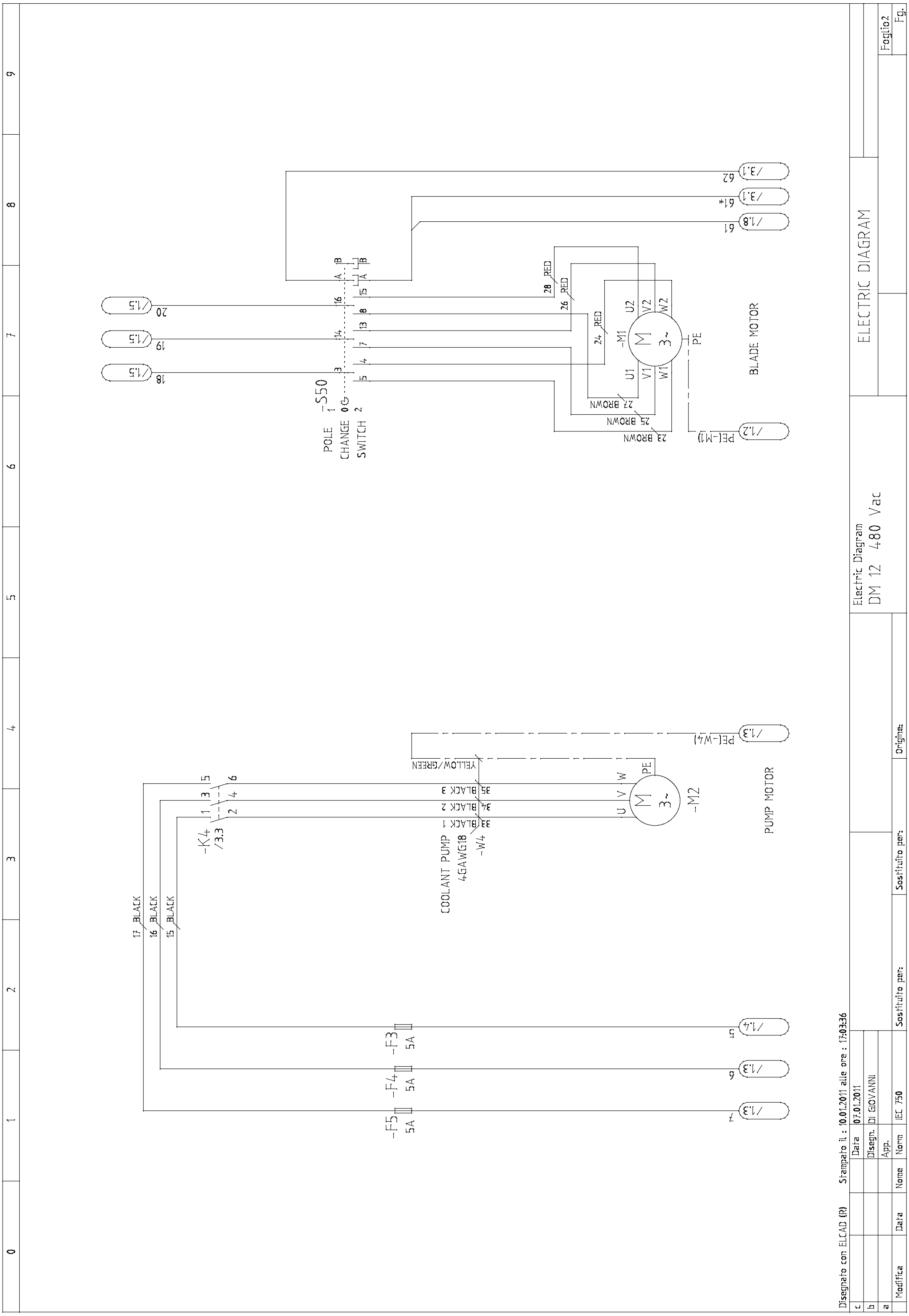
List of components

Code	ID	Rif	Description	Manufacturer
022.1153	-F1	/1,6	FUSE 6,3X32	ITALWEBER
022.2260	-F1	/1,6	FUS-OLDER	WIELAND ELECTRIC
	-F1	/1,6		WIELAND ELECTRIC
	-F1	/1,6		WIELAND ELECTRIC
022.1153	-F2	/1,6	FUSE 6,3X32	ITALWEBER
022.2260	-F2	/1,6	FUS-OLDER	WIELAND ELECTRIC
	-F2	/1,6		WIELAND ELECTRIC
	-F2	/1,6		WIELAND ELECTRIC
022.1153	-F3	/2,1	FUSE 6,3X32	ITALWEBER
022.2260	-F3	/2,1	FUS-OLDER	WIELAND ELECTRIC
	-F3	/2,1		WIELAND ELECTRIC
	-F3	/2,1		WIELAND ELECTRIC
022.1153	-F4	/2,1	FUSE 6,3X32	ITALWEBER
022.2260	-F4	/2,1	FUS-OLDER	WIELAND ELECTRIC
	-F4	/2,1		WIELAND ELECTRIC
	-F4	/2,1		WIELAND ELECTRIC
022.1153	-F5	/2,0	FUSE 6,3X32	ITALWEBER
022.2260	-F5	/2,0	FUS-OLDER	WIELAND ELECTRIC
	-F5	/2,0		WIELAND ELECTRIC
	-F5	/2,0		WIELAND ELECTRIC
022.1153	-F6	/1.9	FUSE 6,3X32	ITALWEBER
022.2260	-F6	/1.9	FUS-OLDER	WIELAND ELECTRIC
	-F6	/1.9		WIELAND ELECTRIC
	-F6	/1.9		WIELAND ELECTRIC
022.0573	-K0	/1.4	LOW TENSION RELAY	ABB
022.3002	-K1	/3.5	CONTACTOR	MOELLER
022.0304	-K4	/3.3	CONTACTOR	MOELLER
022.1265	-Q0	/1.5	MAIN-SWITCH OVER LOAD THERMAL PROTECTION	ABB
022.0582	-Q0	/1.5	DOOR COUPLING HANDLE	ABB
	-Q0	/1.5	EXTENSION SHAFT	ABB
	-Q0	/1.5	ADAPTER	ABB
022.1245	-S4	/1.4	EMERGENCY PUSHBUTTON	MOELLER
022.0911	-S4	/1.4	FIXING ADAPTER	MOELLER
022.0936	-S4	/1.4	BLOK NC (RED)	MOELLER
022.1225	-S22	/3.3	SELECTOR 3P	MOELLER
022.0911	-S22	/3.3	FIXING ADAPTER	MOELLER
022.0937	-S22	/3.3	BLOK NO (GREEN)	MOELLER
022.0937	-S22	/3.3	BLOK NO (GREEN)	MOELLER
022.1226	-S24	/3.1	SELECTOR 2P	MOELLER
022.0911	-S24	/3.1	FIXING ADAPTER	MOELLER
022.0936	-S24	/3.1	BLOK NC (RED)	MOELLER
022.0936	-S24	/3.1	BLOK NC (RED)	MOELLER
022.0937	-S24	/3.1	BLOK NO (GREEN)	MOELLER

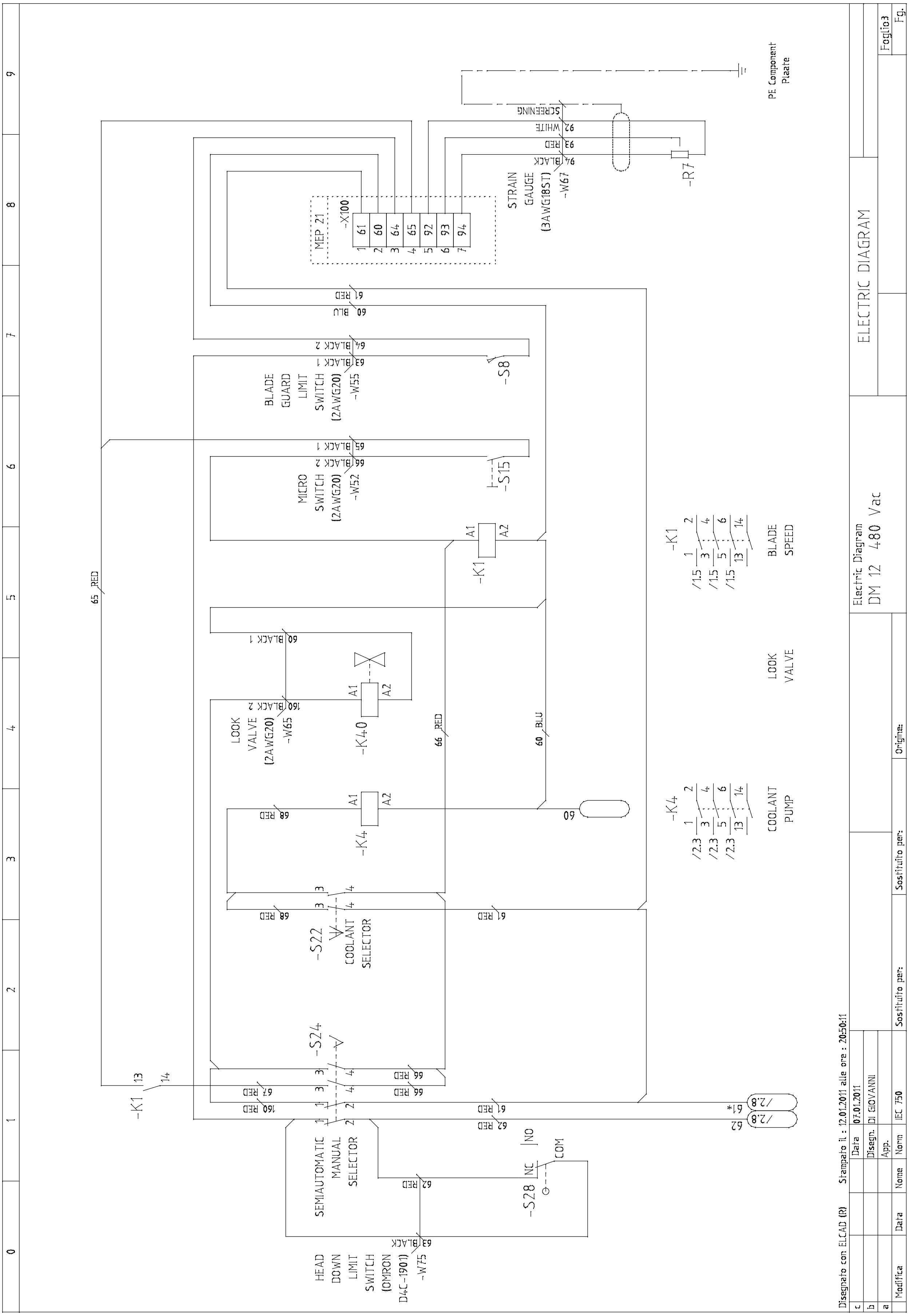
Code	ID	Rif	Description	Manufacturer
022.0937	-S24	/3.1	BLOK NO (GREEN)	MOELLER
022.0506	-S28	/3,0	HEAD DOWN LIMIT SWITCH	OMRON
022.3054	-S50	/2.7	POLE CHANGE SWITCH 20A	MOELLER
022.1616	-T1	/1.7	TRANSFORMER INPUT 0-240-480/OUT. 0-24-/-0-48	ERC

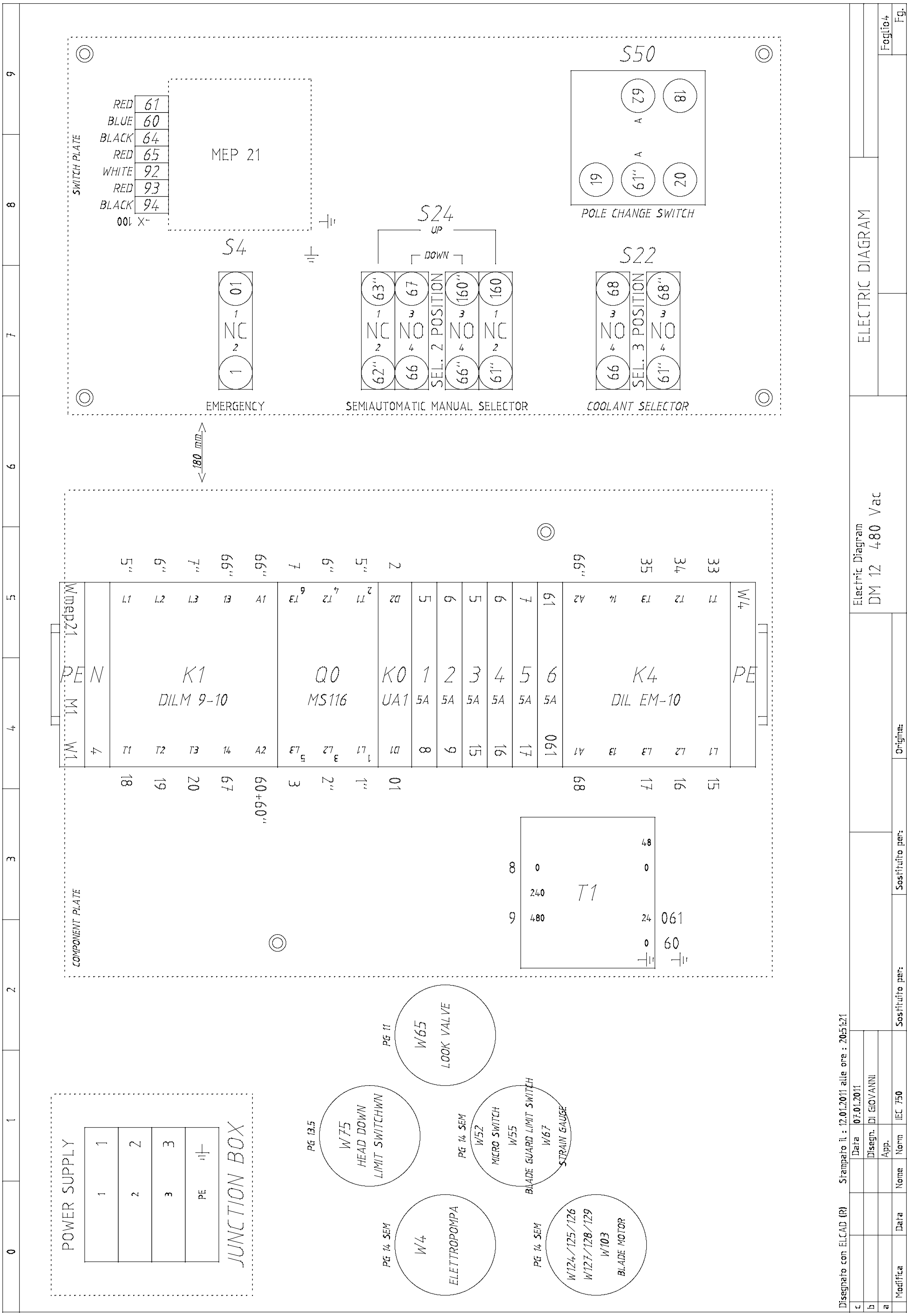
Standardised Wiring Diagrams 480 Vac





ELECTRIC DIAGRAM
Electric Diagram
DM 12 480 Vac
BLADE MOTOR
PUMP MOTOR
POLE CHANGE SWITCH
-S50
COOLANT PUMP
4GAWG18
-W4
-K4
/3.3
-M1
-M2
-F3
-F4
-F5
5A
YELLOW/GREEN
PE(-W4)
PE(-M1)
Disegnato con ELCAD (R)
Stampato il : 10.01.2011 alle ore : 17:03:36
Data 07.01.2011
Disegn. DI GIOVANNI
App.
Norm IEC 750
Modifica
Data
Nome
Sostituito per:
Sostituito da:
Origine:
Foglio2
Fg.


ELECTRIC DIAGRAM
Electric Diagram
DM 12 480 Vac
STRAIN GAUGE (3AWG18ST) -W67
-R7
PE Component Plaate
MEP 21
-X100
BLADE GUARD LIMIT SWITCH (2AWG20) -W55
-S8
MICRO SWITCH (2AWG20) -W52
-S15
-K1
BLADE SPEED
LOOK VALVE (2AWG20) -W65
-K40
LOOK VALVE
-K4
COOLANT PUMP
-S22
COOLANT SELECTOR
-S24
SEMIAUTOMATIC MANUAL SELECTOR
-S28
HEAD DOWN LIMIT SWITCH (OMRON D4C-1901) -W75
Disegnato con ELCAD (R)
Stampato il : 12.01.2011 alle ore : 20:50:11
07.01.2011
DI GIOVANNI
IEC 750
Foglio3



S50
POLE CHANGE SWITCH
MEP 21
SWITCH PLATE
S4
EMERGENCY
S24
UP
DOWN
SEMIAUTOMATIC MANUAL SELECTOR
S22
COOLANT SELECTOR
180 mm
COMPONENT PLATE
K1
DILM 9-10
Q0
MS116
K0
UA1
K4
DIL EM-10
T1
POWER SUPPLY
JUNCTION BOX
W65
LOOK VALVE
W75
HEAD DOWN
LIMIT SWITCHWN
W52
MICRO SWITCH
W55
BLADE GUARD LIMIT SWITCH
W67
STRAIN GAUGE
W4
ELETTROPOMPA
W124/125/126
W127/128/129
W103
BLADE MOTOR
ELECTRIC DIAGRAM
Electric Diagram
DM 12 480 Vac

List of cables

Code	ID	Description	Nr.	Colour	Start	End
022.0225	-W4	COOLANT PUMP	33	BLACK 1	-K4:T1	-M2:U
022.0225	-W4	COOLANT PUMP	34	BLACK 2	-K4:T2	-M2:V
022.0225	-W4	COOLANT PUMP	35	BLACK 3	-K4:T3	-M2:W
022.0225	-W4	COOLANT PUMP		YELLOW/GREEN	-X1:PE	-M2:PE
022.0139	-W52	MICRO SWITCH	65	BLACK 1	-K1:13	-S15
022.0139	-W52	MICRO SWITCH	66	BLACK 2	-K1:A1	-S15
022.0139	-W55	BLADE GUARD L/S	63	BLACK 1	-S24:1	-S8
022.0139	-W55	BLADE GUARD L/S	64	BLACK 2	-XMEP 21:3	-S8
022.0139	-W65	LOOCK VALVE	60	BLACK 1	-K1:A2	-K40:A2
022.0139	-W65	LOOCK VALVE	160	BLACK 2	-S24:3	-K40:A1
022.0224	-W67	STRAIN GAUGE	92	WHITE	-XMEP 21:5	-R7
022.0224	-W67	STRAIN GAUGE	93	RED	-XMEP 21:6	-R7
022.0224	-W67	STRAIN GAUGE	94	BLACK	-XMEP 21:7	-R7
022.0224	-W67	STRAIN GAUGE		SCREENING	-PE:SW PLA-TE	
022.0506	-W75	HEAD DOWN L/S	35	BLACK	-S24:1	-S28
022.0506	-W75	HEAD DOWN L/S	36	RED	-S24:2	-S28
022.0134Y/G	-W100	T1:0 VAC(0-24)/PE		YELLOW/GREEN	T1:0(0-24V)	PE
022.0134Y/G	-W101	X1:PE/PE:SW.PLATE		YELLOW/GREEN	-X1:PE	PE
022.0134Y/G	-W102	X1:PE/M1:PE		YELLOW/GREEN	-X1:PE	-M1:PE
022.0134Y/G	-W103	X10:PE/X1:PE		YELLOW/GREEN	-X10:PE	-X1:PE
022.0134B	-W104	X11:1/Q0:1	1	BLACK	-X11:1	-Q0:1
022.0134B	-W105	X12:2/Q0:3	2	BLACK	-X12:2	-Q0:3
022.0134B	-W106	X13:3/Q0:5	3	BLACK	-X13:3	-Q0:5
022.0134B	-W107	S4:1/Q0:1	1	BLACK	-S4:1	-Q0:1
022.0134B	-W108	K0:D2/Q0:3	2	BLACK	-K0:D2	-Q0:3
022.0134B	-W109	S4:2/K0:D1	01	BLACK	-S4:2	-K0:D2
022.0134B	-W110	Q0:2/F1	5	BLACK	-Q0:2	-F1
022.0134B	-W111	Q0:2/K1:1	5	BLACK	-Q0:2	-K1:1
022.0134B	-W112	K1:1/F3	5	BLACK	-K1:1	-F3
022.0134B	-W113	Q0:4/F2	6	BLACK	-Q0:4	-F2
022.0134B	-W114	Q0:4/K1:3	6	BLACK	-Q0:4	-K1:3
022.0134B	-W115	K1:3/F4	6	BLACK	-K1:3	-F4
022.0134B	-W116	Q0:6/K1:5	7	BLACK	-Q0:6	-K1:5
022.0134B	-W117	K1:5/F5	7	BLACK	-K1:5	-F5
022.0134B	-W118	F1/T1:0(0-480)	8	BLACK	-F1	-T1:0(0-480)
022.0134B	-W119	F2/T1:480(0-480)	9	BLACK	-F2	-T1:480(0-480)
022.0134B	-W120	K1:2/S50:3	18	BLACK	-K1:2	-S50:3
022.0134B	-W121	K1:4/S50:14	19	BLACK	-K1:4	-S50:14
022.0134B	-W122	K1:6/S50:14	20	BLACK	-K1:6	-S50:16
022.0134B	-W123	F3/K4:1	15	BLACK	-F3	-K4:1
022.0134B	-W124	F4/K4:3	16	BLACK	-F4	-K4:3
022.0134B	-W125	F5/K4:5	17	BLACK	-F5	-K4:5
022.0134BR	-W126	S50:5/M1:W1	23	BROWN	-S50:5	-M1:W1
022.0134BR	-W127	S50:7/M1:V1	25	BROWN	-S50:7	-M1:V1
022.0134BR	-W128	S50:8/M1:U1	27	BROWN	-S50:8	-M1:U1
022.0134R	-W129	S50:4/M1:W2	24	RED	-S50:4	-M1:W2
022.0134R	-W130	S50:13/M1:U2	26	RED	-S50:13	-M1:V2
022.0134R	-W131	S50:15/M1:U2	28	RED	-S50:15	-M1:U2

022.0133BL	-W150	T1:0(0-24)/K4:A2	60	BLUE	-T1:0(0-24)	-K4:A2
022.0133BL	-W151	K4:A2/K1:A2	60	BLUE	-K4:A2	-K1:A1
022.0133BL	-W152	K1:A2/X MEP21:2	60	BLUE	-K1:A1	-X MEP21:2
022.0133R	-W160	T1:24(0-24)/F6	061	RED	-T1:24(0-24)	-F6
022.0133R	-W161	F6/S50:A	61	RED	-F6	-S50:A
022.0133R	-W162	S50:A/S24:2	61	RED	-S50:A	-S24:2
022.0133R	-W163	S24:2/S22:4	61	RED	-S24:2	-S22:4
022.0133R	-W164	S22:4/X MEP21:1	61	RED	-S22:4	-X MEP21:1
022.0133R	-W165	S50:A/S24:2	62	RED	-S50:A	-S24:2
022.0133R	-W166	K1:13/X MEP21:4	62	RED	-K1:13	-X MEP21:4
022.0133R	-W167	S24:4/S24:4	66	RED	-S24:4	-S24:4
022.0133R	-W168	S24:4/S22:4	66	RED	-S24:4	-S22:4
022.0133R	-W169	S22:4/K1:A1	66	RED	-S22:4	-K1:A1
022.0133R	-W170	K1:14/S24:3	67	RED	-K1:14	-S24:3
022.0133R	-W171	S22:3/S22:3	68	RED	-S22:3	-S22:3
022.0133R	-W172	S22:3/K4:A1	68	RED	-S22:3	-K4:A1
022.0133R	-W173	S24:3/S24:3	160	RED	-S24:3	-S24:3

List of components

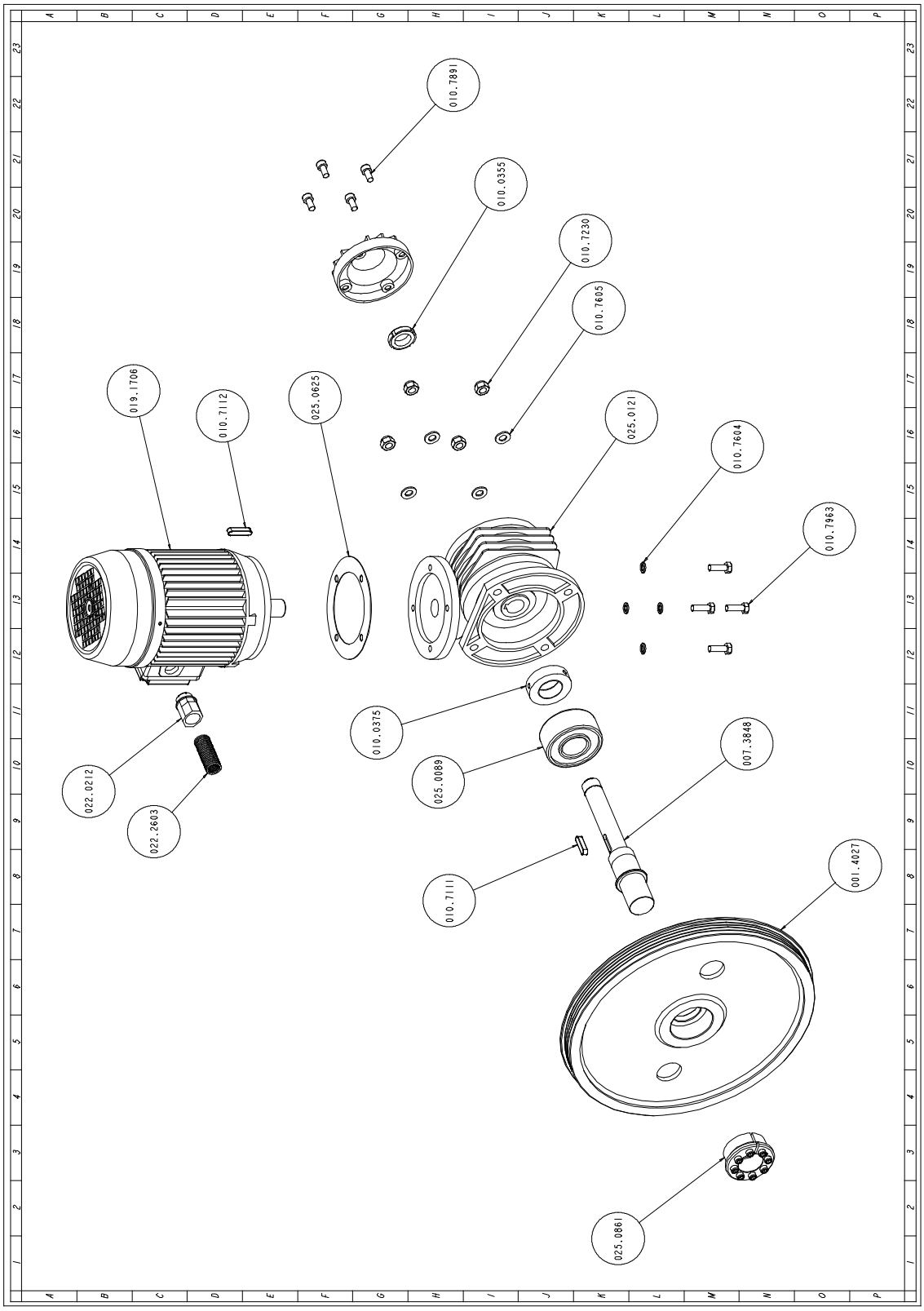
Code	ID	Rif	Description	Manufacturer
022.1153	-F1	/1,6	FUSE 6,3X32	ITALWEBER
022.2260	-F1	/1,6	FUS-OLDER	WIELAND ELECTRIC
	-F1	/1,6		WIELAND ELECTRIC
	-F1	/1,6		WIELAND ELECTRIC
022.1153	-F2	/1,6	FUSE 6,3X32	ITALWEBER
022.2260	-F2	/1,6	FUS-OLDER	WIELAND ELECTRIC
	-F2	/1,6		WIELAND ELECTRIC
	-F2	/1,6		WIELAND ELECTRIC
022.1153	-F3	/2,1	FUSE 6,3X32	ITALWEBER
022.2260	-F3	/2,1	FUS-OLDER	WIELAND ELECTRIC
	-F3	/2,1		WIELAND ELECTRIC
	-F3	/2,1		WIELAND ELECTRIC
022.1153	-F4	/2,1	FUSE 6,3X32	ITALWEBER
022.2260	-F4	/2,1	FUS-OLDER	WIELAND ELECTRIC
	-F4	/2,1		WIELAND ELECTRIC
	-F4	/2,1		WIELAND ELECTRIC
022.1153	-F5	/2,0	FUSE 6,3X32	ITALWEBER
022.2260	-F5	/2,0	FUS-OLDER	WIELAND ELECTRIC
	-F5	/2,0		WIELAND ELECTRIC
	-F5	/2,0		WIELAND ELECTRIC
022.1153	-F6	/1.9	FUSE 6,3X32	ITALWEBER
022.2260	-F6	/1.9	FUS-OLDER	WIELAND ELECTRIC
	-F6	/1.9		WIELAND ELECTRIC
	-F6	/1.9		WIELAND ELECTRIC
022.0583	-K0	/1.4	LOW TENSION RELAY	ABB
022.3002	-K1	/3.5	CONTACTOR	MOELLER
022.0304	-K4	/3.3	CONTACTOR	MOELLER
022.1264	-Q0	/1.5	MAIN-SWITCH OVER LOAD THERMAL PROTECTION	ABB
022.0582	-Q0	/1.5	DOOR COUPLING HANDLE	ABB
	-Q0	/1.5	EXTENSION SHAFT	ABB
	-Q0	/1.5	ADAPTER	ABB
022.1245	-S4	/1.4	EMERGENCY PUSHBUTTON	MOELLER

Code	ID	Rif	Description	Manufacturer
022.0911	-S4	/1.4	FIXING ADAPTER	MOELLER
022.0936	-S4	/1.4	BLOK NC (RED)	MOELLER
022.1225	-S22	/3.3	SELECTOR 3P	MOELLER
022.0911	-S22	/3.3	FIXING ADAPTER	MOELLER
022.0937	-S22	/3.3	BLOK NO (GREEN)	MOELLER
022.0937	-S22	/3.3	BLOK NO (GREEN)	MOELLER
022.1226	-S24	/3.1	SELECTOR 2P	MOELLER
022.0911	-S24	/3.1	FIXING ADAPTER	MOELLER
022.0936	-S24	/3.1	BLOK NC (RED)	MOELLER
022.0936	-S24	/3.1	BLOK NC (RED)	MOELLER
022.0937	-S24	/3.1	BLOK NO (GREEN)	MOELLER
022.0937	-S24	/3.1	BLOK NO (GREEN)	MOELLER
022.0506	-S28	/3,0	HEAD DOWN LIMIT SWITCH	OMRON
022.3054	-S50	/2.7	POLE CHANGE SWITCH 20A	MOELLER
022.1616	-T1	/1.7	TRANSFORMER INPUT 0-240-480/OUT. 0-24-/-0-48	ERC

Exploded views

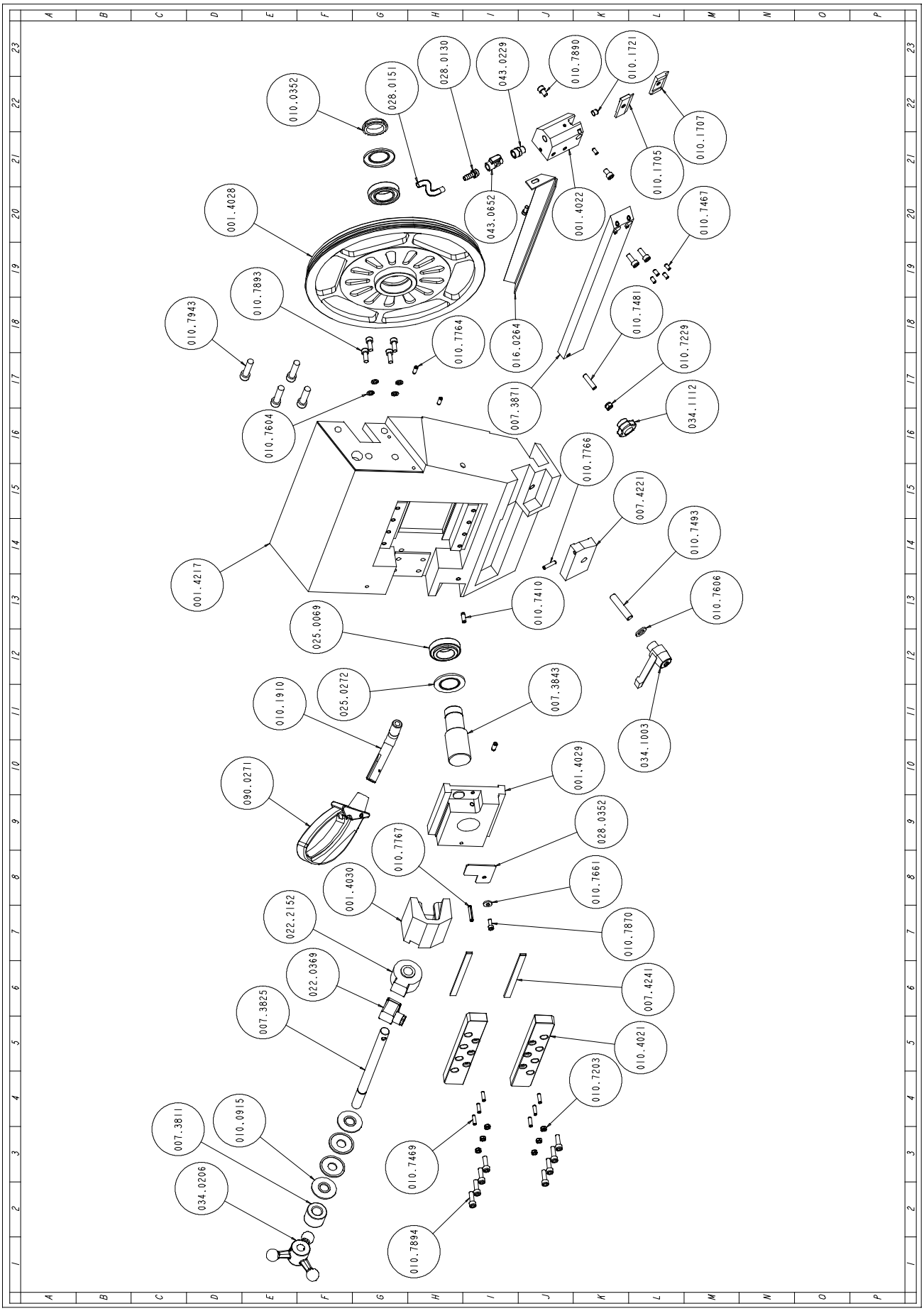
This part of the manual contains detailed exploded views of the machine which can help to gain a deeper knowledge of how it is made.

Motor assembly



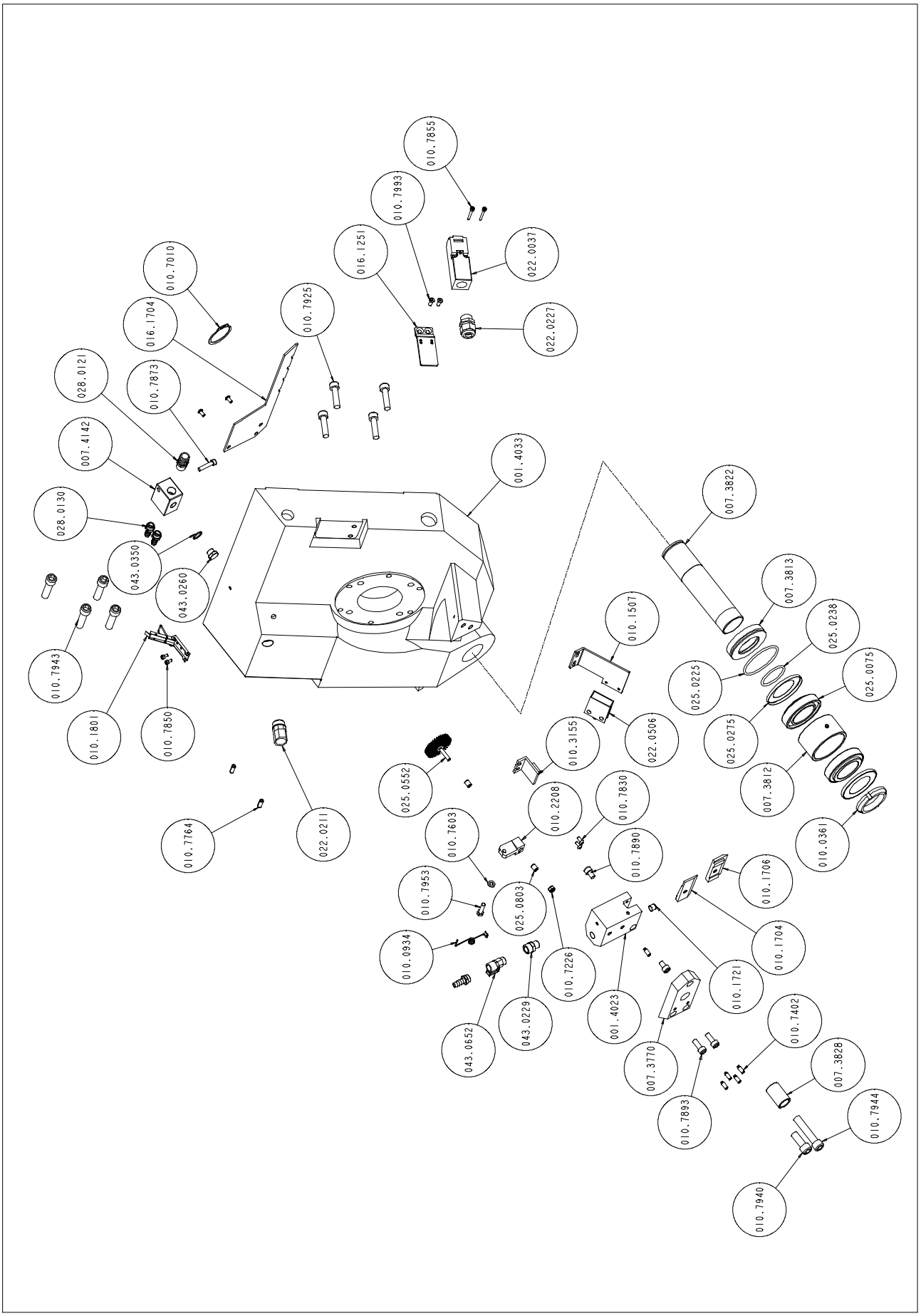
Code	Description	Description	Q.ty
001.4027	PULEGGIA MOTRICE MOD.1225	MOTOR WHEEL MOD.1225	1,000
007.3849	ALBERO RIDUTTORE DIAM. 25	REDUCER SHAFT WITH RING- NUT	1,000
010.0355	GHIERA AUTOBLOCCANTE 25X1,5	SELF- LOCKING RING NUT 25X1,5	1,000
010.0375	GHIERA ALBERO RIDUTTORE	LOCKNUT FOR DRIVE SHAFT	1,000
010.7111	CHIAVETTA 8 X 7 X 32 (010.7111)	8 X 7 X 32 KEY	1,000
010.7112	CHIAVETTA 8 X 7 X 35 (010.7112)	8 X 7 X 35 KEY (010.7112)	1,000
010.7230	DADO AUTOBLOCCANTE M10 (010.7230)	M10 SELF- LOCKING SCREW NUT	4,000
010.7604	RONDELLA 0 8 (010.7604)	0 8 WASHER (010.7604)	4,000
010.7605	RONDELLA 0 10 (010.7605)	0 10 WASHER (010.7605)	4,000
010.7871	VITE TCEI 6 X 20 (010.7871)	TCEI 6 X 20 SCREW (010.7871)	8,000
010.7891	VITE TCEI 8 X 16 (010.7891)	TCEI 8 X 16 SCREW (010.7891)	4,000
010.7963	VITE TE 8 X 25 (010.7963)	TE 8 X 25 SCREW (010.7963)	4,000
019.1706	HP 2/2,5 2/4P V.380 B14	MOTOR HP 2/2,5 2/4PV.380 B14	1,000
022.0212	RACCORDO RAPIDO SEM PG 16	RAPID JOINT SEM PG 16	1,000
022.2603	GUAINA POLIFLEX NW 17- 1200178	POLIFLEX COVERING NW 17- 1200178	1,000
025.0089	CUSCINETTO 3307 A2RS	BEARING 3307 A2RS	1,000
025.0121	RIDUTTORE MVF 63 FCO 1A38 90 B14	GEARBOX MVF 63 FCO 1A38 90 B14	1,000
025.0625	GUARNIZIONE MOTORE SH 310- 320- 330	MOTOR GASKET SH 310- 320- 330	1,000
025.0861	CALETTATORE 0 35X60	CONNECTOR 0 35X60	1,000
034.0418	COPERCHIO RIDUTTORE	REDUCTOR COVER	1,000

Front flywheel assembly



Code	Description	Description	Q.ty
001.4022	TESTINA GUIDALAMA ANTERIORE	FRONT BAND GUIDE HEAD	1,000
001.4028	PULEGGIA FOLLE ARCHETTO MOD. 1224	BOW IDLER WHEEL MOD.1224	1,000
001.4029	SLITTA TENDILAMA ARCHETTO MOD. 1226	SLIDE MOD. 1226	1,000
001.4030	SUPPORTO TENSIONAMENTO LAMA ELETT. MOD.1403	SUPPORT FE MOD.1403	1,000
001.4217	ARCHETTO SEZIONE PULEGGIAFOLLEMOD.1220	IDLER WHEEL BOW MOD.1220	1,000
007.3811	DISTANZIALE VOLANTINO SH	WHEEL SPACER SH	1,000
007.3825	PERNO REGISTRO TENSIONAMENTO LAMASH	BAND TENSION REGISTER PIN SHARK	1,000
007.3843	ALBERO VOLANO LIBERO SH N.T.	IDLER WHEEL SHAFT SH N.S.	1,000
007.3871	SUPPORTO TESTINA ANT.SH280- 292- 332	FRONT HEAD SUPPORT SH 280	1,000
007.4221	STAFFA BLOCCAGGIO GUIDA TESTINA	LOCKING BRACKET	1,000
007.4241	LARDONE SLITTA TENDILAMA SH 320- 330	BAND GUIDE SLIDE GIB SH 320- 330	2,000
010.0352	GHIERA AUTOBLOCCANTE 35X1,5	SELF- LOCKING RING NUT 35X1,5	1,000
010.0915	MOLLA A TAZZA 50X18,4X3	BELLEVILLE SPRING WASHERS 50X18,4X3	4,000
010.1705	GUIDALAMA 1 INSERTO ANTERIORE SH N.T.	1 INSERT FRONT BAND GUIDE SH N.S.	1,000
010.1707	GUIDALAMA 2 INSERTI ANTERIORE SH N.T.	2 INSERTS FRONT BAND GUIDE	1,000
010.1721	PREMILAMA SHARK	TOP CARBIDE SHARK	1,000
010.1910	LEVA COMANDO TESTA BT	BT LEVER	1,000
010.4021	PIASTRA REGOLAZIONE SLITTA LARDONE	GIB SLIDE ADJUSTMENT PLATE	2,000
010.7203	DADO M6 (010.7203)	M6 SCREW NUT (010.7203)	6,000
010.7229	DADO AUTOBLOCCANTE M8	M8 SELF- LOCKING SCREW NUT	1,000
010.7410	GRANO VCE PUNTA CILINDRICA 8X16(010.7410	8 X 16 CYLIND.POINT VCE GRUB SC-REW	2,000
010.7467	GRANO VCE PUNTA PIANA 6 X 12 (010.7467)	6 X 12 FLAT POINT VCE GRUB SCREW	5,000
010.7469	GRANO VCE PUNTA PIANA 6 X 20 (010.7469)	6 X 20 FLAT POINT VCE GRUB SCREW	6,000
010.7481	GRANO VCE PUNTA PIANA 8 X 35 (010.7481)	8X35 FLAT POINT VCE GRUB SCREW	1,000
010.7493	GRANO VCE PUNTA PIANA 12 X 60	12 X 60 FLAT POINT VCE GRUB SC-REW	1,000
010.7604	RONDELLA 0 8 (010.7604)	0 8 WASHER (010.7604)	4,000
010.7606	RONDELLA 0 12 (010.7606)	0 12 WASHER (010.7606)	1,000
010.7661	RONDELLA SPESSORE DIAM. 6X3	THICKNESS WASHER DIAM. 6X3	1,000
010.7764	SPINA ELASTICA DIAM. 6 X 20 (010.7764)	ELASTIC PIN DIAM. 6 X 20 (010.7764)	2,000
010.7766	SPINA ELASTICA DIAM. 6 X 30 (010.7766)	ELASTIC PIN DIAM. 6 X 30 (010.7766)	1,000
010.7767	SPINA ELASTICA DIAM. 6 X 35 A SPIRALE	ELASTIC PIN DIAM. 6 X 35	1,000
010.7870	VITE TCEI 6 X 16 (010.7870)	TCEI 6 X 16 SCREW (010.7870)	2,000
010.7890	VITE TCEI 8 X 12 (010.7890)	TCEI 8 X 12 SCREW (010.7890)	2,000
010.7893	VITE TCEI 8 X 20 (010.7893)	TCEI 8 X 20 SCREW (010.7893)	6,000
010.7894	VITE TCEI 8 X 25 (010.7894)	TCEI 8 X 25 SCREW (010.7894)	8,000
010.7943	VITE TCEI 12 X 45 (010.7943)	TCEI 12 X 45 SCREW (010.7943)	4,000
016.0264	PROTEZIONE LAMA ANTERIORE	FRONT BAND GUARD	1,000
022.0369	CONNETTORE PER BOBINA U2 E TENSIONATO-RETRSA/3T.00	CONNECTOR F.U2 COIL AND TEN-SIONER	1,000
022.2152	TENSIONATORE ELETTRONICO TRSA/3T.00	ELECTRONIC TENSIONER TRSA/3T.00	1,000
025.0069	CUSCINETTO 32007X	BEARING 32007X	2,000
025.0272	ANELLO DI PROTEZIONE NILOS 32007	NILOS SEAL RING 32007	2,000
028.0130	RACCORDO 1/4- 9 CL 2601	JOINT 1/4- 9 CL 2601	1,000
028.0151	TUBO PLASTIFICATO 07- 11	PLASTIC HOSE 07- 11	1,000
028.0352	PROTEZIONE GOMMA SLITTA TENDILAMA	RUBBER GUARD	1,000
034.0206	VOLANTINO TENSIONAMENTO LAMA SH	BAND TENSIONING HANDWHEEL SH	1,000
034.1003	LEVA A SCATTO 12 MA	LEVER 12 MA	1,000
034.1112	VOLANTINO O 40M8 X PIEDISTALLO	O 40 M8 HANDWHEEL X STEEL BASE	1,000
043.0229	RIDUZIONE MF 1/4 - CL 2520	MF 1/4 - CL 2520 REDUCTION	1,000
043.0652	RUBINETTO 1/4 F.M.	1/4 F. M. TAP	1,000
090.0271	IMPUGNATURA COMPLETA TIPO MEP	COMPLETE MEP HANDLE	1,000

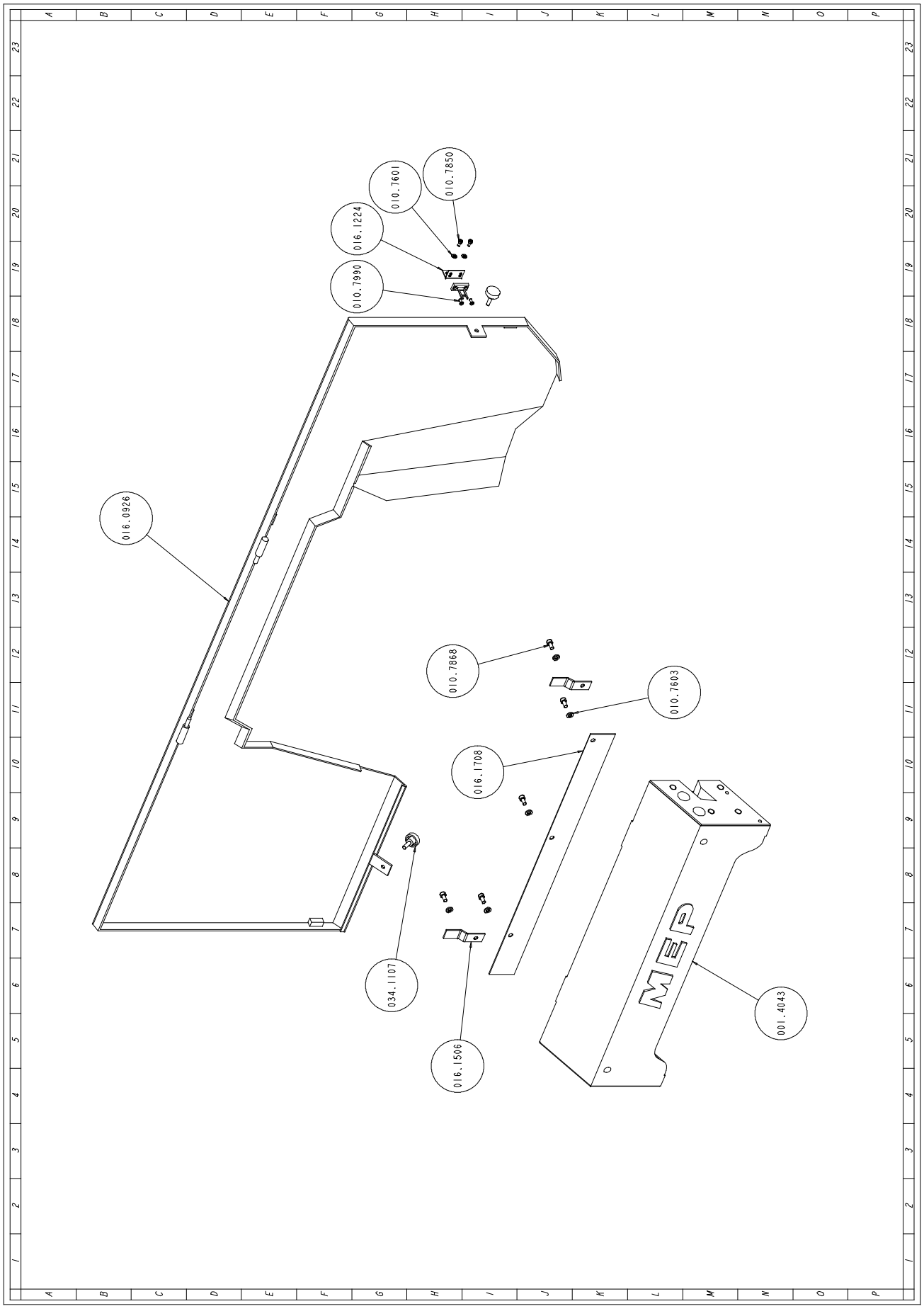
Motor flywheel assembly



Code	Description	Description	Q.ty
007.3812	DISTANZIALE CUSCINETTO SNODO TESTA	BEARING SPACER	1.000
007.3813	DISTANZIALE ARCHETTO SH	BOW SPACER SH	1.000
010.0934	MOLLA X PULILAMA SH N.T.	BAND BRUSHES SPRING SH N.T.	1.000
010.1801	CHIUSURA LEVA - D- ZINCATA SH	- D- ZINC LEVER CLOSURE SH	1.000
022.0037	INTERRUTTORE DI SICUREZZA FR 690 SH	FR 690 SH SAFETY SWITCH	1.000
025.0552	SPAZZOLA PULILAMA SHARK 6X25X50	BAND BRUSH 6X25 030 SHARK	1.000
025.0803	BOCCOLA GRAFITATA L. 10 DIAM. 6	GRAPHITIZED BUSHING L. 10 DIA M. 6	2.000
025.0075	CUSCINETTO 32009X	BEARING 32009X	2.000
025.0238	ANELLO DI TENUTA OR 149- 44,45X3,53	O RING 149- 44,45X3,53	1.000
025.0225	ANELLO TENUTA OR 171- 68,26	O RING 171- 68,26	1.000
001.4033	ARCHETTO SEZIONE PULEGGIA MOTRICE	BOW WITHOUT REDUCER	1.000
010.1721	PREMILAMA SHARK	TOP CARBIDE SHARK	1.000
010.7226	DADO AUTOBLOCCANTE M6 (010.7226)	M6 SELF- LOCKING SCREW NUT	1.000
022.0506	FINECORSA D4C- 1901 2M ALIMEN.AX- AXI	LIMIT SWITCH F.FEEDER AX- AXI	1.000
010.0356	GHIERA AUTOBLOCCANTE 45X1,5 SH	SELF- LOCKING RING NUT 45X1,5 SH	1.000
010.1704	GUIDALAMA 1 INSERTO POSTERIORE SH N.T.	1 INSERT REAR BAND GUIDE SH N.S.	1.000
010.1706	GUIDALAMA 2 INSERTI POSTERIORE SH N.T.	2 INSERTS RAER BAND GUIDE SH N.S.	1.000
010.7925	VITE TCEI 10 X 40	TCEI 10 X 40 SCREW	4.000
010.7940	VITE TCEI 12 X 30	TCEI 12 X 30 SCREW	1.000
010.7943	VITE TCEI 12 X 45 (010.7943)	TCEI 12 X 45 SCREW (010.7943)	4.000
010.7944	VITE TCEI 12 X 60	TCEI 12 X 60 SCREW	1.000
010.7855	VITE TCEI 4 X 30 (010.7855)	TCEI 4 X 30 SCREW (010.7855)	2.000
010.7850	VITE TCEI 4 X 8 (010.7850)	TCEI 4 X 8 SCREW	2.000
010.7830	VITE BUTON 5 X 10 (010.7830)	5 X 10 BUTON SCREW (010.7830)	4.000
010.7993	VITE TSPEI 5 X 12 (010.7993)	TSPEI 5 X 12 SCREW (010.7993)	2.000
010.7402	GRANO VCE P.CILINDRICA 6X12	6 X 12 CYLIND.POINT VCE GRUB SC-REW	5.000
010.7953	VITE TE 6 X 25 (010.7953)	TE 6 X 25 SCREW (010.7953)	1.000
010.7873	VITE TCEI 6 X 30 (010.7873)	TCEI 6 X 30 SCREW (010.7873)	1.000
010.7890	VITE TCEI 8 X 12 (010.7890)	TCEI 8 X 12 SCREW (010.7890)	2.000
010.7893	VITE TCEI 8 X 20 (010.7893)	TCEI 8 X 20 SCREW (010.7893)	2.000
025.0275	ANELLO DI PROTEZIONE NILOS 32009X	NILOS GUARD RING 32009X	2.000
007.3822	PERNO SUPPORTO SNODO TESTA	HEAD PIVOT SUPPORT PIN	1.000
022.0211	RACCORDO RAPIDO SEM PG 13,5	RAPID JOINT SEM PG 13,5	1.000
016.1251	PIASTRA ATTACCO F.C. CHIUSURA COPER-CHIOARCHETTO	PLATE FIXING SAFETY SWITCH	1.000
010.2208	PORTASPAZZOLA PULILAMA	BAND BRUSH HOLDER	1.000
022.0227	PRESSACAVO PLASTICA TEC- SM 2006.3.9 M20	PLASTIC CABLE PRESSER TEC-SM2006.3.9 M20	1.000
016.1704	PROTEZIONE LAMA POST.	REAR BAND GUARD	1.000
028.0130	RACCORDO 1/4- 9 CL 2601	JOINT 1/4- 9 CL 2601	3.000
028.0121	RACCORDO 3/8- 17 CL 2601	JOINT 3/8- 17 CL 2601	1.000
043.0229	RIDUZIONE MF 1/4 - CL 2520	MF 1/4 - CL 2520 REDUCTION	1.000
010.7603	RONDELLA 0 6 (010.7603)	0 6 WASHER (010.7603)	1.000
043.0652	RUBINETTO 1/4 F.M.	1/4 F. M. TAP	1.000
010.7010	ANELLO SEEGER 0 45 (010.7010)	0 45 SEEGER RING	1.000
010.7764	SPINA ELASTICA DIAM. 6 X 20 (010.7764)	ELASTIC PIN DIAM. 6 X 20 (010.7764)	2.000
007.4142	SQUADRETTO PER LIQUIDO	PLATE	1.000
007.3770	SUPPORTO TESTINA POSTERIORE	REAR HEAD SUPPORT	1.000
010.1507	STAFFA FIX FINE CORSA CCS SH280N.T.	CCS LIMIT SWITCH FIX BRACKET	1.000
010.3155	STAFFA FIX SPAZZOLA PULILAMA	FIX. BRACKET	1.000
043.0260	TAPPO TTE4 1/4 - CL 2611	1/4 TAP TTE4	1.000
001.4023	TESTINA GUIDALAMA POSTERIORE MOD.1215	REAR BAND GUIDE HEAD	1.000
007.3828	BOCCOLA BATTUTA FINECORSA	LIMIT STROKE BUSHING	1.000

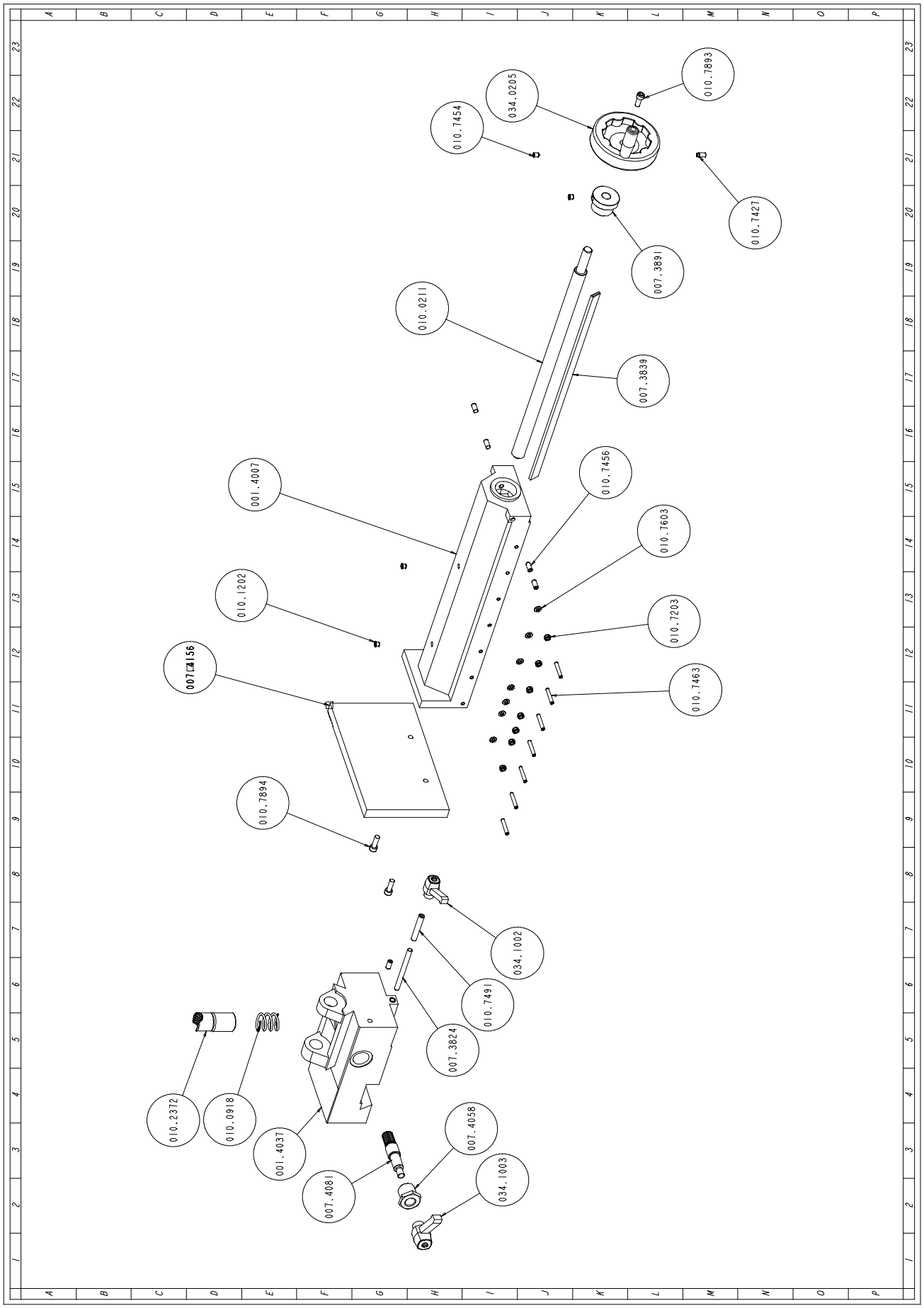
Code	Description	Description	Q.ty
010.0361	GHIERA DI PRECISIONE 45X1,5	PRECISION RING NUT 45X1,5	1.000
043.0350	GUARNIZIONE GFV 1/4	GFV 1/4 GASKET	1.000

Cutting head cover



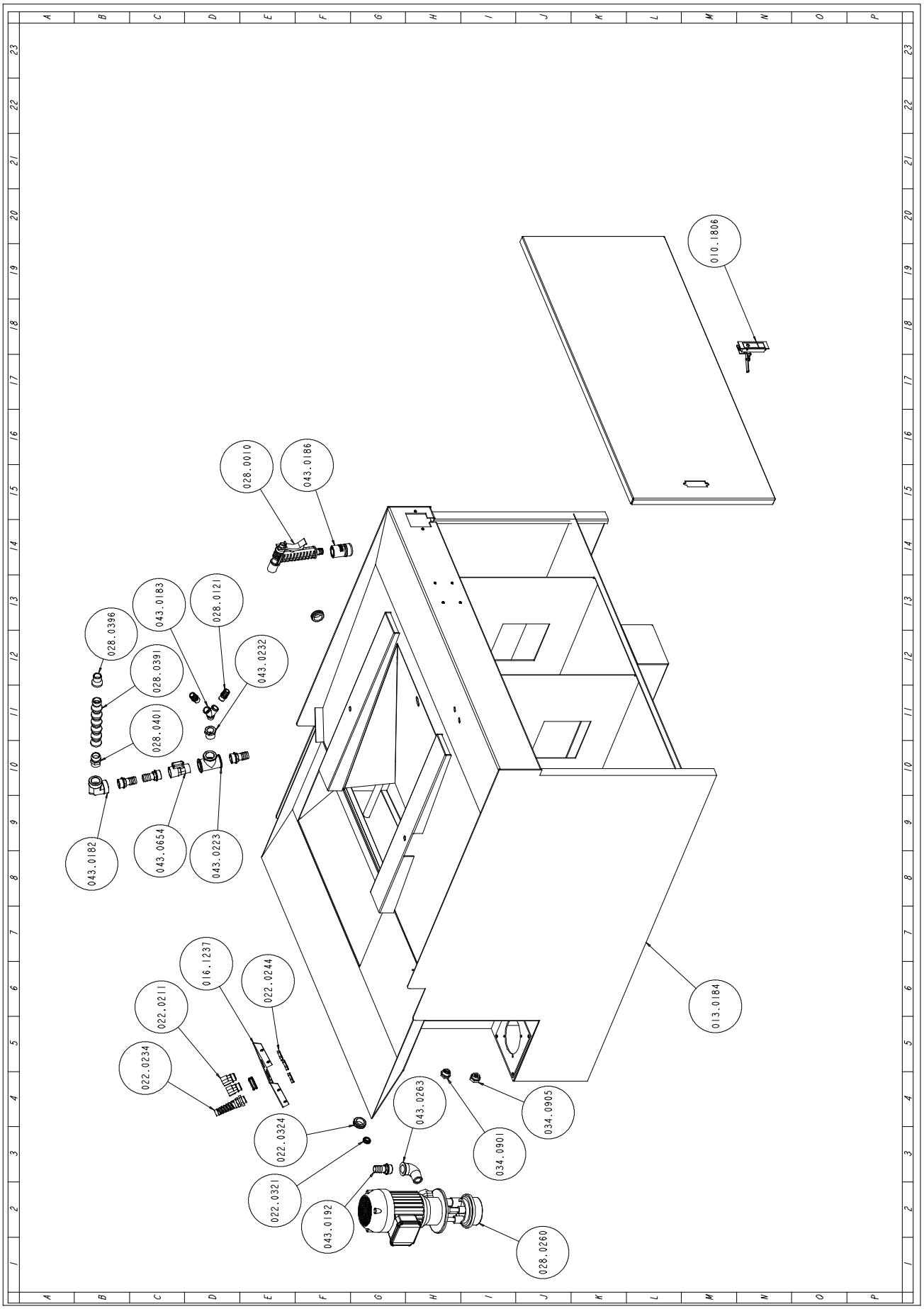
Code	Description	Description	Q.ty
001.4043	TRAVE ARCHETTO MOD.1414	BOW BEAM	1,000
010.7601	RONDELLA 0 4	0 4 WASHER	2,000
010.7603	RONDELLA 0 6	0 6 WASHER	5,000
010.7850	VITE TCEI 4 X 8	TCEI 4 X 8 SCREW	2,000
010.7868	VITE TCEI 6 X 12	TCEI 6 X 12 SCREW	5,000
010.7990	VITE TSPEI 4 X 8	TSPEI 4 X 8 SCREW	2,000
016.0926	COPERCHIO ARCHETTO	BOW COVER	1,000
016.1224	PIASTRINO FIX INTERRUTTORE SICUREZZACO-PERCHIO	COVER SAFETY SWITCH FIX PLATE	1,000
016.1506	STAFFA DI FERMO	LOCKING BRACKET	2,000
016.1708	PROTEZIONE CAVI	CABLES GUARD	1,000
034.1107	VOLANTINO O 30 M6 X 20	O 30 M6 X 20 HANDWHEEL	2,000

Vice assembly



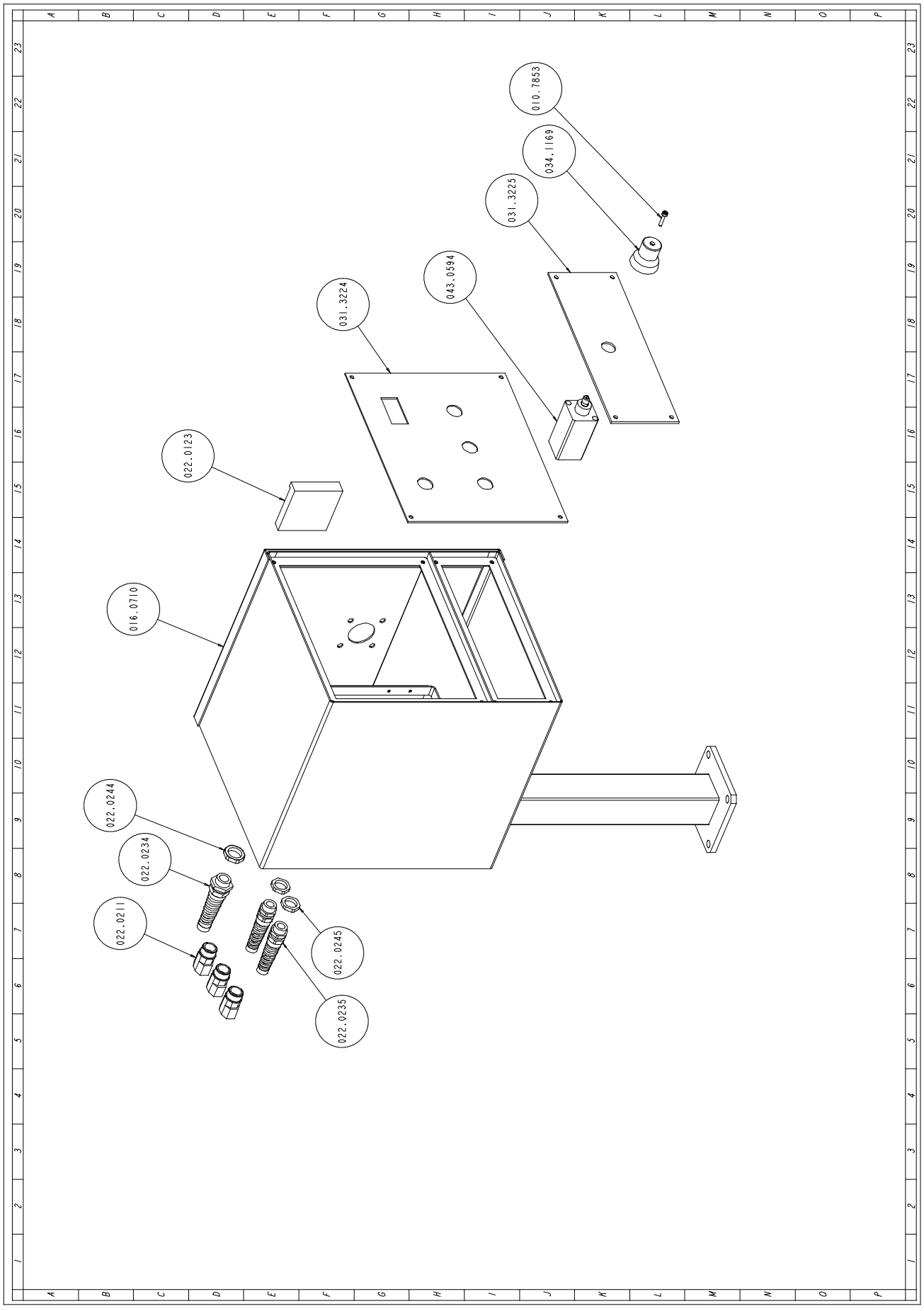
Code	Description	Description	Q.ty
001.4007	SCORREVOLE MORSA MOD. 1207	UPPER VICE	1,000
001.4037	SUPPORTO MORSA MOD.1206	VICE SUPPORT MOD.1206	1,000
007.3824	PERNO BLOCCAGGIO MORSA SERRAGGIO RAPIDO	LOCKING PIN	1,000
007.3839	LARDONE MORSA	VICE GIB	1,000
007.3891	BOCCOLA VITE MORSA	VICE SCREW BUSHING	1,000
007.4058	BOCCOLA ECCENTRICA	ECCENTRIC BUSHING	1,000
007.4081	PIGNONE SBLOCCAGGIO SCORREVOLE	UNLOCKING LOWER VICE PINION	1,000
007.4156	GANASCIA MORSA MOBILE	MOVING VICE JAW	1,000
010.0211	VITE MORSA 525X24TPN D.0696- 07	VICE SCREW 525X24	1,000
010.0918	MOLLA RICHIAMO CHIOCCIOLA VITE MORSA	VICE SCREW NUT RETURN SPRING	1,000
010.1202	OLIATORE A SFERA DIAM. 8	OIL FILLER DIAM.8	3,000
010.2372	CHIOCCIOLA BRONZO 45	SCREW NUT 45	1,000
010.7203	DADO M6	M6 SCREW NUT	7,000
010.7427	GRANO VCE PUNTA CILINDRICA 8 X 12	8 X 12 CYLIND.POINT VCE GRUB SCREW	1,000
010.7454	GRANO VCE PUNTA CONICA 8 X 8	8 X 8 CONICAL POINT VCE GRUB SCREW	1,000
010.7456	GRANO VCE PUNTA CONICA 8 X 16	8 X 16 CONICAL POINT VCE GRUB SCREW	5,000
010.7463	GRANO VCE PUNTA CONICA 6 X 35	6 X 35 CONICAL POINT VCE GRUB SCREW	7,000
010.7491	GRANO VCE PUNTA PIANA 10 X 60	10 X 60 FLAT POINT VCE GRUB SCREW	1,000
010.7603	RONDELLA 0 6	0 6 WASHER	7,000
010.7893	VITE TCEI 8 X 20	TCEI 8 X 20 SCREW	1,000
010.7894	VITE TCEI 8 X 25	TCEI 8 X 25 SCREW	2,000
034.0205	VOLANTINO VPRA/125 MR1	VPRA/125 HANDWHEEL	1,000
034.1002	LEVA A SCATTO 10 MA	LEVER 10 MA	1,000
034.1003	LEVA A SCATTO 12 MA	LEVER 12 MA	1,000

Base assembly



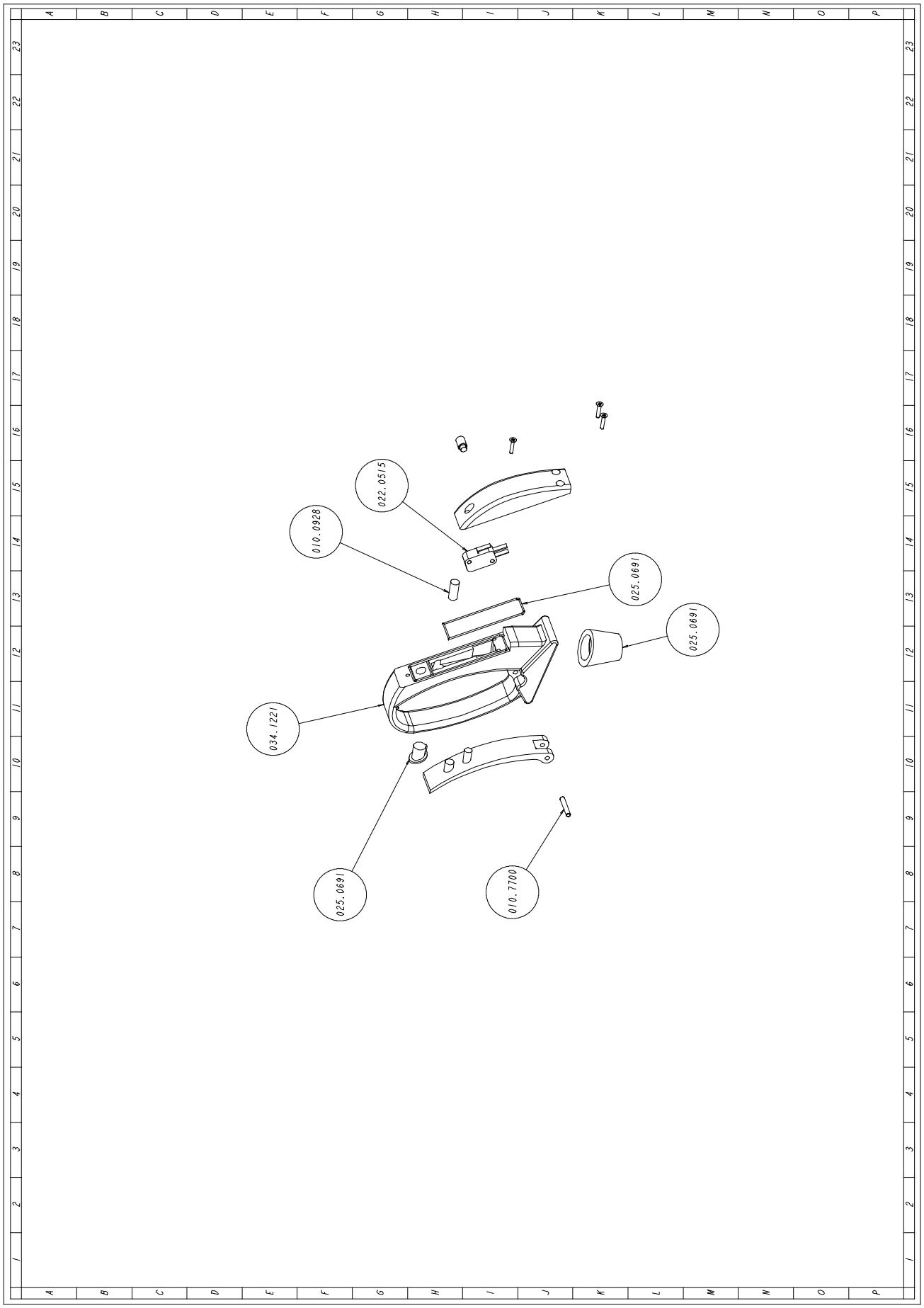
Code	Description	Description	Q.ty
010.1806	CHIUSURA SPORTELLO PIEDISTALLO CONCHIA-VE	BASE DOOR LOCKING WIT KEY	1,000
013.0184	PIEDISTALLO	BASE	1,000
016.1237	PIASTRA PASSACAVI POSTERIORE	BACK FAIRLEAD P LATE	1,000
022.0211	RACCORDO RAPIDO SEM PG 13,5	RAPID JOINT SEM PG 13,5	2,000
022.0234	PRESSACORDONE 3246 NERO PG 13,5	CORD PRESSER	1,000
022.0244	CONTRODADO 3217B GRIGIO PG 13,5	LOCK NUT 3217B GREY PG 13,5	3,000
022.0321	PASSACAVI 12 INC.MM.2	FAIRLEADS 12 INC.M M.2	1,000
022.0324	PASSACAVI 24 INC.MM.2.5	FAIRLEADS 24 INC.M M.2.5	3,000
028.0010	PISTOLA SH- TI ART. 8966	COOLANT PISTOL SH- TI 8966	1,000
028.0121	RACCORDO 3/8- 17 CL 2601	JOINT 3/8- 17 CL 2601	2,000
028.0260	ELETTROPOMPA V.220- 240/380- 415.50HZSPV33	ELECTROPUMP 230- 400.50 HZ SPV33	1,000
028.0391	TUBO LOOC LINE SPD ART.69540 3/4	LOOC LINE HOSE SPD ART.69540 3/4	1,000
028.0396	UGELLO 0 20 SPD FP50.11B50	NOZZLE 0 20 SPD FP50.11B50	1,000
028.0401	RACCORDO 3/4 SPD FP50.17A20	FITTING 3/4 SPD FP50.17A20	1,000
034.0901	TAPPO LIVELLO OLIO 1/2 'GAS.	1/2" GAS. OIL LEVEL CAP	1,000
034.0905	TAPPO OLIO TAO/3 1/2' NERO	TAO/3 1/2" BLACK OIL CAP	1,000
043.0182	RACCORDO A GOMITO FF ZINCATO 3/4	3/4 ELBOW ZINKED JOINT	1,000
043.0183	RACCORDO A Y 90 MASCHIO 3/8	Y MALE JOINT 3/8	1,000
043.0186	RACCORDO FEMMINA 1/2 ACQUASTOP	1/2 WATERASTOP FEMALE JOINT	1,000
043.0192	RACCORDO RB 9889 3/4X20	RB 9889 JOINT 3/4X20	4,000
043.0223	RACCORDO TE FFF ZINCATO 3/4	TE FFF GALVANISED 3/4 JOINT	1,000
043.0232	RIDUZIONE ZINCATA 3/4M- 1/2F	GALVANISED 3/4 REDUCTION	1,000
043.0263	RACCORDO A GOMITO M/F ZINCATO 3/4	3/4 ELBOW JOINT	1,000
043.0654	RUBINETTO M/F 3/4 CL 6310	M/F 3/4 CL 6310 TAP	1,000

Control panel



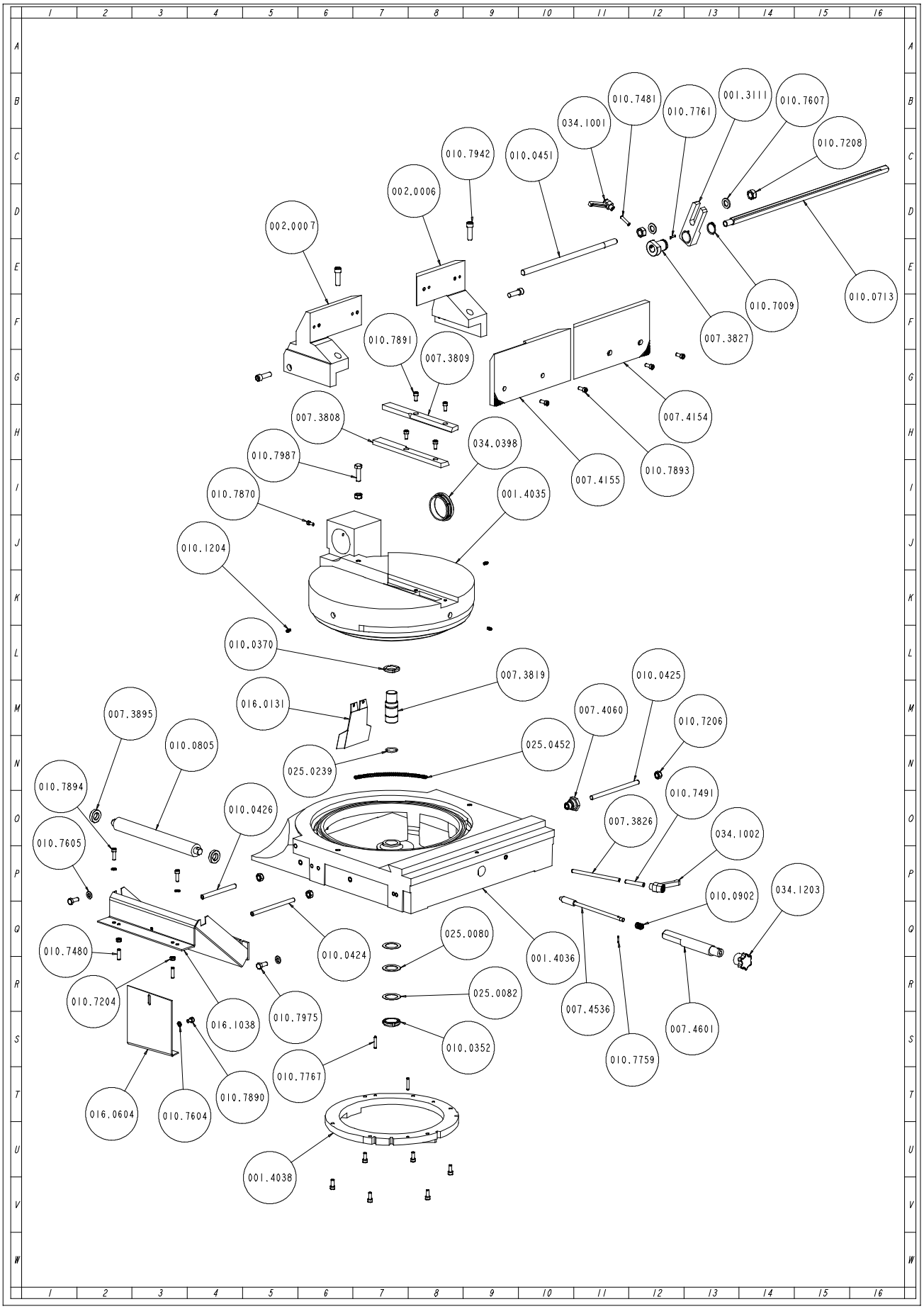
Code	Description	Description	Q.ty
010.7853	VITE TCEI 4 X 20 (010.7853)	TCEI 4 X 20 SCREW (010.7853)	1,000
016.0710	QUADRO COMANDI SH 332 CCS DM 10- 12	CONTROL PANEL SH	1,000
022.0123	COMANDO BLOCCOPORTA LUCCHETTABILE 140 MC DN 66	MAIN DISCONNECT SWITCH	1,000
022.0211	RACCORDO RAPIDO SEM PG 13,5	RAPID JOINT SEM PG 13,5	3,000
022.0234	PRESSACORDONE 3246 NERO PG 13,5	CORD PRESSER	1,000
022.0235	PRESSACORDONE 3243 NERO PG 11	CORD PRESSER	2,000
022.0244	CONTRODADO 3217B GRIGIO PG 13,5	LOCK NUT 3217B GREY PG 13,5	1,000
022.0245	CONTRODADO 3213B GRIGIO PG 11	LOCK NUT 3213B GREY PG 11	2,000
031.3224	PANNELLO COMANDI	UPPER CONTROL PANEL	1,000
031.3225	PANNELLO COMANDI SH 320- 332 CONTROLLO DITAGLIO INFERIORE	LOWER CONTROL PANEL SH 320 CCS	1,000
034.1169	MANOPOLA REGOLAZIONE MONOGIRO	FEED RATE KNOB (W/ SEMICIRCLE HOLE)	1,000
043.0594	REGOLATORE IDRAULICO MONOGIROUNIDIRE-ZIONALE	HYDRAULIC REGULATOR	1,000

Handgrip



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

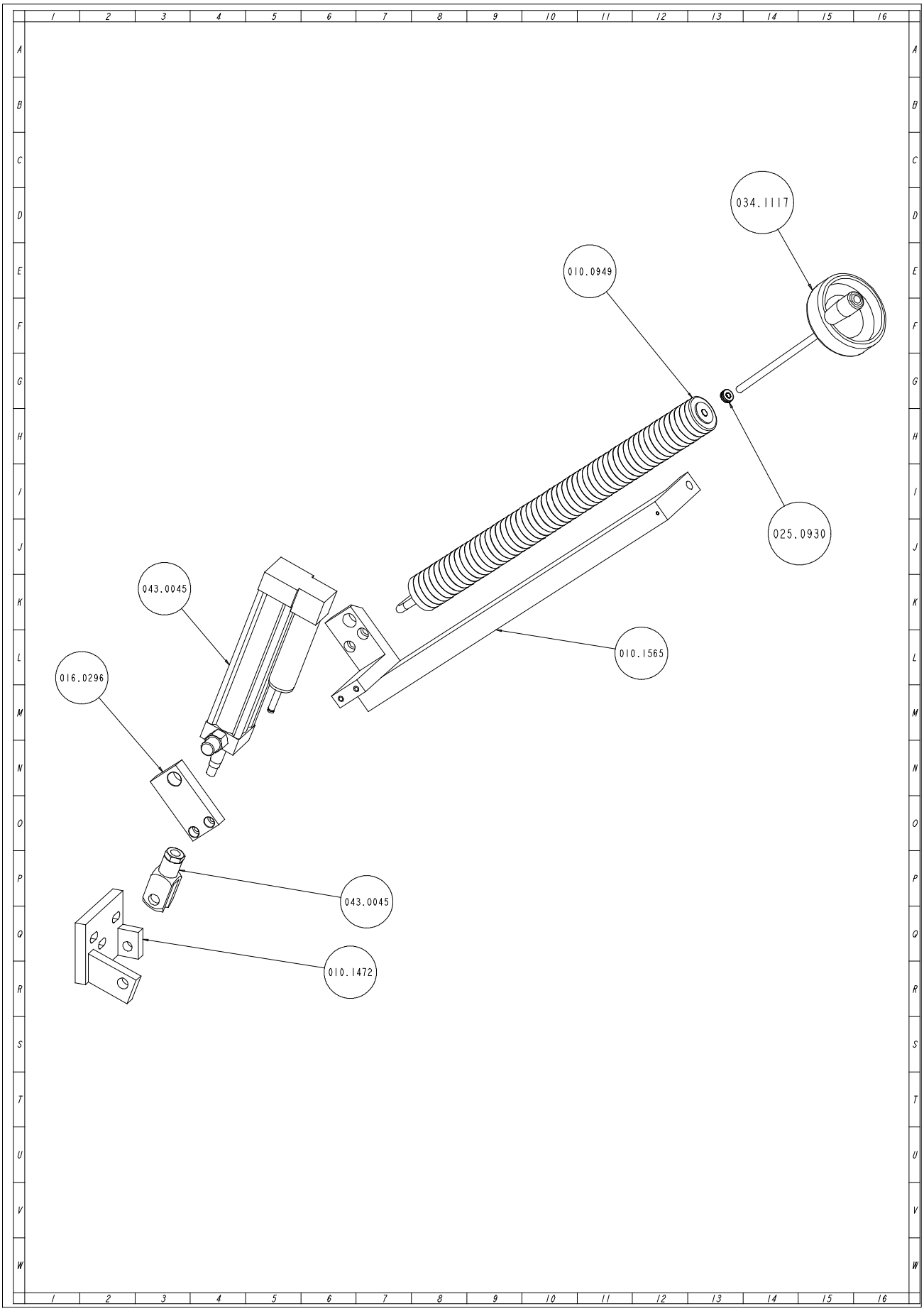
Fixed work table and turntable



Code	Description	Description	Q.ty
001.3111	DISTANZIALE BATTUTA MOD. 7	STOP SPACER	1,000
002.0006	SQUADRO MORSA DESTRO MOD.1204	RIGHT VICE BACK STOP MOD.1204	1,000
002.0007	SQUADRO MORSA SX SH 332 MOD.1205	LEFT VICE BAK STOP SH 332	1,000
001.4035	PIANO GIREVOLE MOD. 1229	ROTATING TABLE MOD.1229	1,000
001.4036	PIATTAFORMA FISSA MOD.1201	FIXED PLATFORM MOD.1201	1,000
001.4038	ANELLO PIANO GIREVOLE SH320- SH332 M1216	ROTATING TABLE RING SH 320 M.1216	1,000
007.3808	PIASTRA APPOGGIA PEZZI SINISTRA	LEFT STOCK SUPPORT PLATE	1,000
007.3809	PIASTRA APPOGGIA PEZZI DESTRA	RIGHT STOCK SUPPORT	1,000
007.3819	PERNO DI CENTRO	CENTRE PIN	1,000
007.3826	PERNO BLOCCAGGIO PIANO GIREVOLE	ROTATING TABLE LOCKING PIN	1,000
007.3827	BOCCOLA PER BATTUTA	STOP BUSHING	1,000
007.3895	BOCCOLA 0 38 X RULLO	BUSH 0 38 FOR ROLLER	2,000
007.4060	BOCCOLA BATTUTA 45 DX	BUSHING F.STOP AT 45 RIGHT	1,000
007.4154	GANASCIA MORSA DESTRA SH 332	RIGHT VICE JAW SH 332	1,000
007.4155	GANASCIA MORSA SINISTRA SH 332	LEFT VICE JAW SH 332	1,000
007.4536	PERNO PUNTO FISSO SH 200- 282- 332	PIN SH 200	1,000
007.4601	CILINDR.PUNTO FISSO SH 200- 282- 332	FIXED POINT CYLINDER SH 200	1,000
010.0352	GHIERA AUTOBLOCCANTE 35X1,5	SELF- LOCKING RING NUT 35X1,5	1,000
010.0370	GHIERA 5S 30X1,5	RING NUT 5S 30X1,5	1,000
010.0424	GRANO PUNTA PIANA 12X170	GRUB SCREW 12X170	1,000
010.0425	GRANO PUNTA PIANA 12X190	GRUB SCREW 12X190	1,000
010.0426	GRANO PUNTA PIANA 12X135	GRUB SCREW 12X135	1,000
010.0451	TIRANTE BATTUTA TAGLI A MISURA	CUT TO MEASURE STOP TIE ROD	1,000
010.0713	ASTA MILLIMETRATA CROMATA MM.600 0 20FIL. M16	MM SCALE 600 0 20	1,000
010.0805	RULLO CARBONITRURATO D38/15 T.15.05	ROLLER D38/15 T.15.05	1,000
010.0902	MOLLA PUNTO FISSO TESTA MOD. 95	HEAD FIXED POINT SPRING	1,000
010.1204	INGRASSATORE M 6	M 6 LUBRICATOR	3,000
010.7009	ANELLO SEEGER 0 30 (010.7009)	0 30 SEEGER RING (010.7009)	1,000
010.7204	DADO M8 (010.7204)	M8 SCREW NUT (010.7204)	2,000
010.7206	DADO M12 (010.7206)	M12 SCREW NUT (010.7206)	4,000
010.7208	DADO M16 (010.7208)	M16 SCREW NUT (010.7208)	2,000
010.7480	GRANO VCE PUNTA PIANA 8 X 30	8 X 30 FLAT POINT VCE GRUB SCREW	2,000
010.7481	GRANO VCE PUNTA PIANA 8 X 35	8X35 FLAT POINT VCE GRUB SCREW	2,000
010.7491	GRANO VCE PUNTA PIANA 10 X 60	10 X 60 FLAT POINT VCE GRUB SC-REW	1,000
010.7604	RONDELLA 0 8 (010.7604)	0 8 WASHER (010.7604)	3,000
010.7605	RONDELLA 0 10 (010.7605)	0 10 WASHER (010.7605)	2,000
010.7607	RONDELLA 0 16 (010.7607)	0 16 WASHER (010.7607)	2,000
010.7759	SPINA ELASTICA DIAM. 3 X 16 (010.7759)	ELASTIC PIN DIAM. 3 X 16 (010.7759)	1,000
010.7761	SPINA ELASTICA DIAM. 4 X 20 (010.7761)	ELASTIC PIN DIAM. 4 X 20 (010.7761)	1,000
010.7767	SPINA ELASTICA DIAM. 6 X 35 A SPIRALE	ELASTIC PIN DIAM. 6 X 35	2,000
010.7870	VITE TCEI 6 X 16 (010.7870)	TCEI 6 X 16 SCREW (010.7870)	1,000
010.7890	VITE TCEI 8 X 12 (010.7890)	TCEI 8 X 12 SCREW (010.7890)	1,000
010.7891	VITE TCEI 8 X 16 (010.7891)	TCEI 8 X 16 SCREW (010.7891)	4,000
010.7893	VITE TCEI 8 X 20 (010.7893)	TCEI 8 X 20 SCREW (010.7893)	10,000
010.7894	VITE TCEI 8 X 25 (010.7894)	TCEI 8 X 25 SCREW (010.7894)	2,000
010.7942	VITE TCEI 12 X 40 (010.7942)	TCEI 12 X 40 SCREW	4,000
010.7975	VITE TE 10 X 25 (010.7975)	TE 10 X 25 SCREW (010.7975)	2,000
010.7987	VITE TE 12 X 40	TE 12 X 40 SCREW	1,000
016.0131	CARTER TRUCIOLI PER PIANO GIREVOLE	ROTATING TABLE SWARF COVER	1,000
016.0604	SUPPORTO BRACCETTO APPOGGIA BARRA	STOCK ARM SUPPORT	1,000
016.1038	BRACCETTO APPOGGIA BARRA	BAR SUPPORT ARM	1,000
025.0080	GABBIA ASSIALE A RULLINI AXK 3552	AXIAL CAGE WITH ROLLERS AXK 3552	1,000

Code	Description	Description	Q.ty
025.0082	RALLA AS 3552	CENTER PLATE AS 3552	2,000
025.0239	ANELLO DI TENUTA OR 4112	O RING 4112	1,000
025.0452	RULLI 6X6 AISI 420	ROLLERS 6X6 AISI 420	219,000
034.0398	COPERCHIO SNODO TESTA SH N.T.	HEAD PIVOT COVER SH N.S.	1,000
034.1001	LEVA A SCATTO 8 MA PK55	LEVER 8 MA PK55	1,000
034.1002	LEVA A SCATTO 10 MA	LEVER 10 MA	1,000
034.1203	IMPUGNATURA NS. DISEGNO M10	MEP MADE HANDWHEEL M10	1,000

Cylinder unit



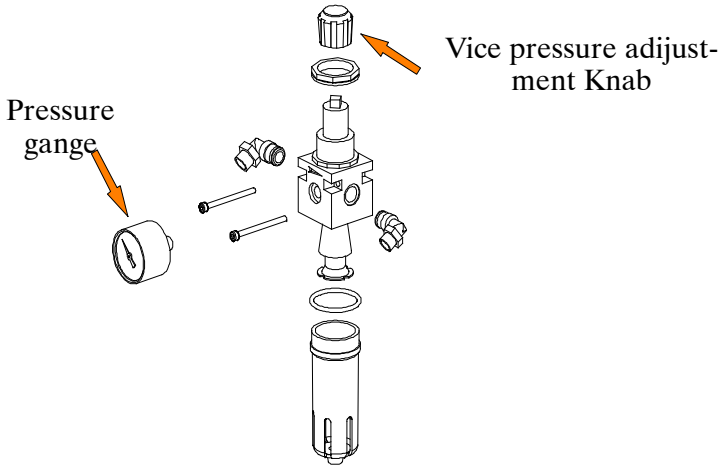
Code	Description	Description	Q.ty
010.0949	MOLLA RICHIAMO TESTA	HEAD RETURN SPRING	1,000
010.1472	STAFFA AGGANCIO MOLLA	SPRING BRACKET	1,000
010.1565	STAFFA SUPPORTO CILINDRO	CYLINDER SUPPORT BRACKET	1,000
016.0296	STAFFA ESTERNA CILINDRO SH	OUTER CYLINDER BRACKET SH	1,000
025.0930	CUSCINETTO 51100	BEARING 51100	1,000
034.1117	VOLANTINO DSH D.100+MANIGLIA RIBALT. +BARRA FILETT.M10X185	HANDWHEEL DSH M10X185	1,000
043.0045	CILINDRO REGOLATORE DISCESA TESTA	HEAD DOWN STROKE CYLINDER	2,000

Adjustments

The adjustment operations for correct use of the **DM12** mechanical, pneumatic and hydraulic systems are described in this chapter.
These instructions will enable you to “customise” your machine to suit the type of cuts you want, optimising the time required to complete them.

Air treatment unit (MA version)

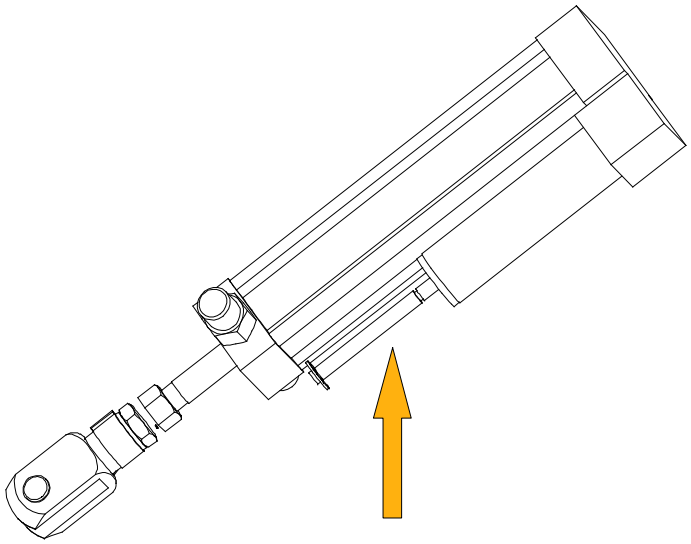
In the MA version of the **DM12**, the machine’s pneumatic circuit actuates the vice by means of a pneumatic cylinder.
The compressed air is treated and purified at the inlet to the system by an air treatment unit, which, if so calibrated, regulates the pressure at about 6 Bar, irrespective of the pressure in use in the factory circuit.
The pressure can in any case be set should the workpiece be subject to deforming stress or is unstable during the cutting process; the vice should be positioned at 2- 3 mm from the piece before final clamping.
The user is requested to have available in the workshop a plant having the characteristics described in CHAPTER 4.
The diagram below shows an exploded view of the air treatment unit: the working pressure is regulated by rotating the knob indicated by the arrow, and is displayed on the pressure gauge.



Topping up and bleeding the cylinder

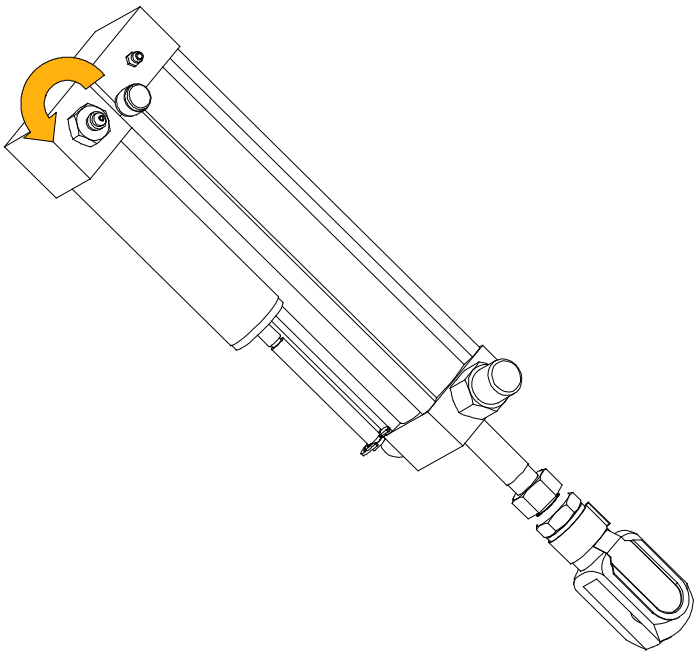
Topping up the head cylinder

This operation is done when the oil in the hydraulic cylinder compensator tank is low. First the cylinder head is brought to the FCTI (Head Up Limiter) position so that the oil level in the compensation tank (see photograph below) can be checked using the rod. If the rod upper ring location is not visible, the oil level is insufficient.

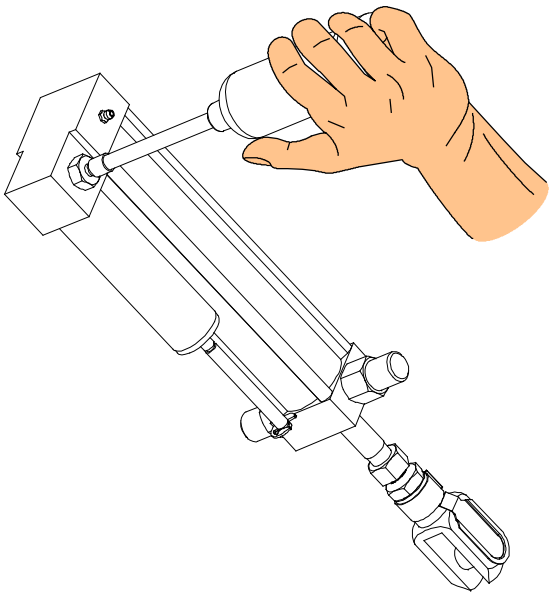


To top up the oil in the tank, the instructions are as follows:

- keep the head in the FCTI position (fully up) by closing the head descent regulator;
- unscrew the filler valve cap;



▶ using a manual pump, loaded with MOBIL DTE 11 oil (or equivalent - see table in Chapter 8), top up until the upper rod groove exits, as illustrated above.

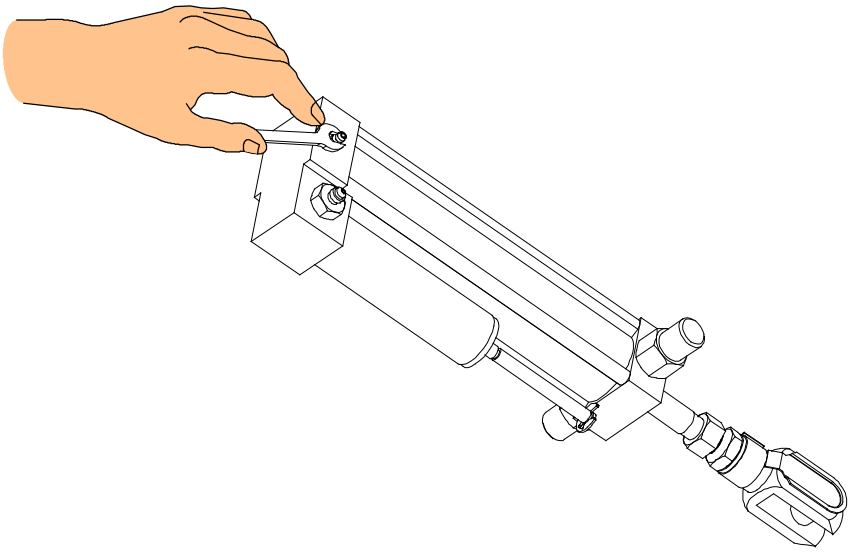


Bleeding the head cylinder

Accumulations of air inside the hydraulic circuit cause the head to stutter in down phase. When this happens, bleed the circuit as follows:

▶ position the head at FCTI;

▶ using a 10 mm open wrench, slacken the bleed valve until oil exits;



▶ close the valve and perform a number of empty work cycles; if necessary, top up the compensation tank.

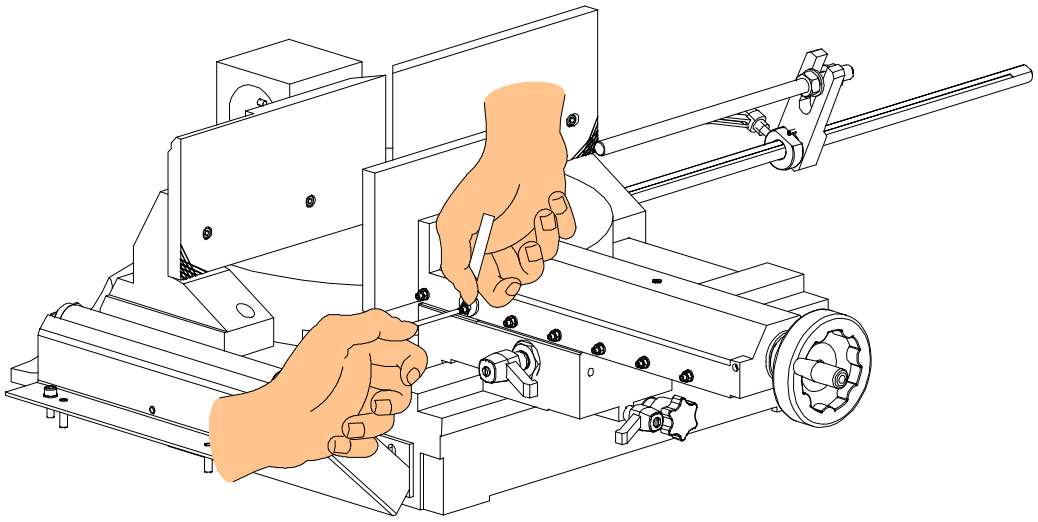
N.B. The oil which spills out during the above operation can be collected using a pipe inserted on the valve, and re- used.

Vice

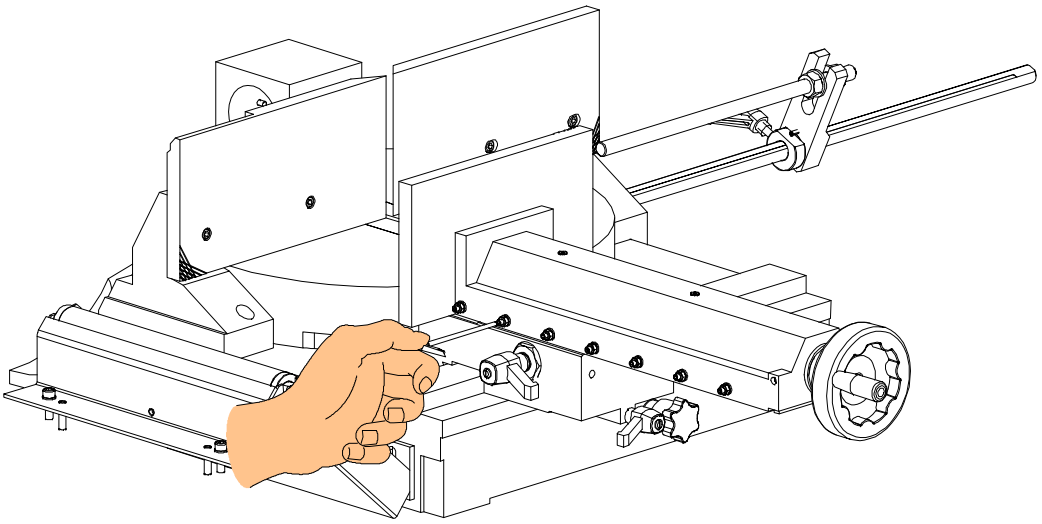
Vice play adjustment

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

- slacken all the locknuts on the grub screws, using a hexagonal key to hold the screws still;
- open the vice to its full extension;

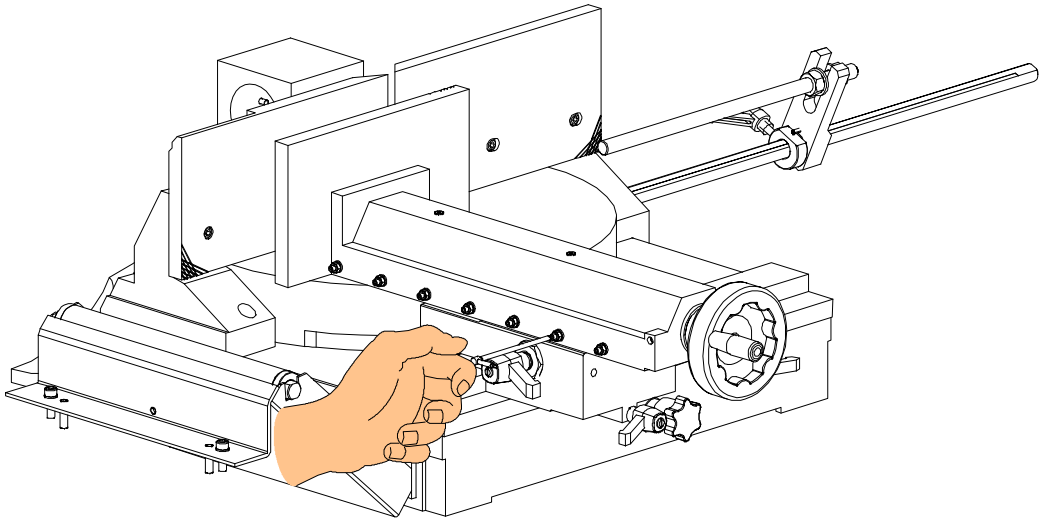


- adjust the slight pressure exerted by the grub screws on the gib, starting with the first two in contact with the lead screw;
- after adjusting the two grub screws, tighten the locknut, holding the grub screws with the hexagonal key;



- close the vice until two more grub screws are in the same position as the first two previously;
- repeat the operation on the gib grub screws on all the slideway grub screws;

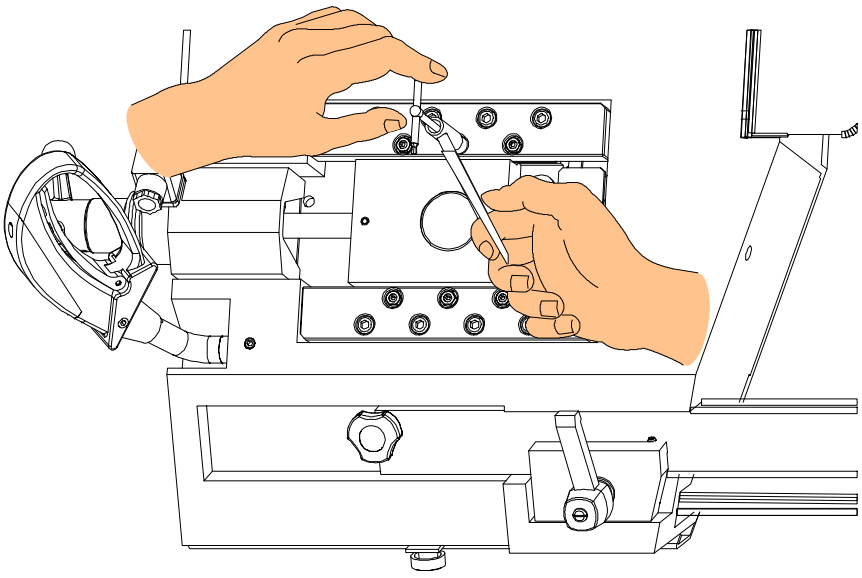
- at the end of the operation, use the handwheel to move the slideway back and forth, identifying the zones where the grub screws exert greater pressure on the gib.



Cutting head

Blade tensioner slide play adjustment

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

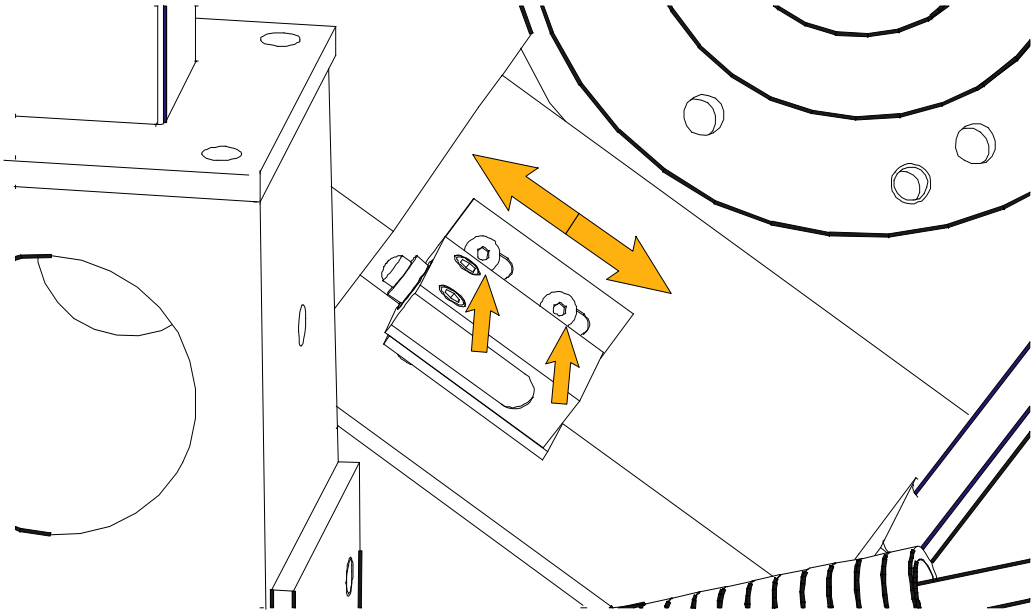


- remove the blade from the flywheels;
- move the slide backwards and forwards to locate any friction or play;
- slacken the nuts, holding the grub screws with a hexagonal pipe wrench;
- if there is play, tighten the grub screws; if there is friction rubbing, loosen the grub screws.

Adjusting operating head travel

The cutting head sequence, during the cutting cycle, is conditioned by FTCI (End Run Cutting Head Backwards) points and FCTA (End Run Cutting Head Forwards). It is possible to set the end cut (FCTA) point as illustrated:

- Loosen the end run support screw fasteners and move it forward and backward in the slots to near it or distance it from the contact point.
- Tighten the screws when the optimal position has been obtained.



Blade guide parts

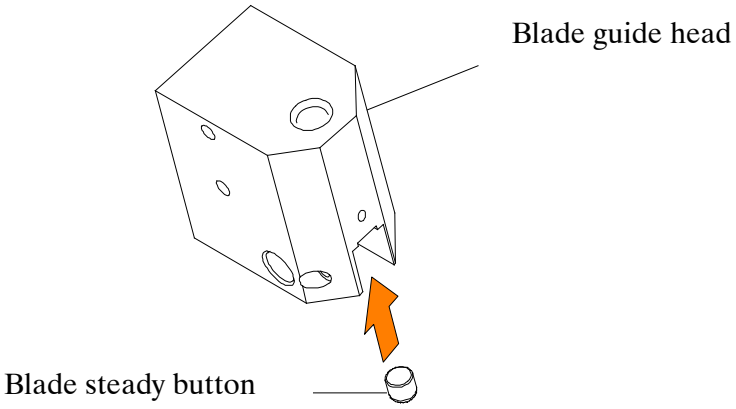
Band saw blades offer enormous advantages to cutting applications, without requiring any special skills by the operator. A description follows of the blade guide adjustments required to ensure correct operation of the saw.

Blade guide heads

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

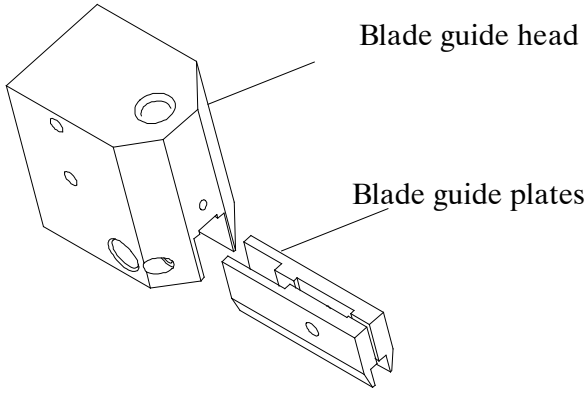
Blade steady buttons

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



Blade guide plates

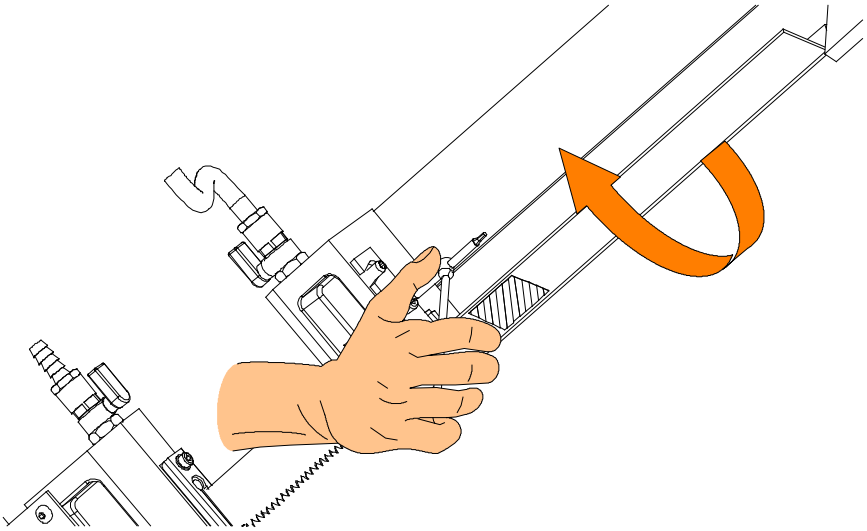
The plate contact points feature widia inserts which guide the blade longitudinally. A small amount of play must exist between the plates and blade to ensure that the blade runs smoothly and perpendicular to the work table.



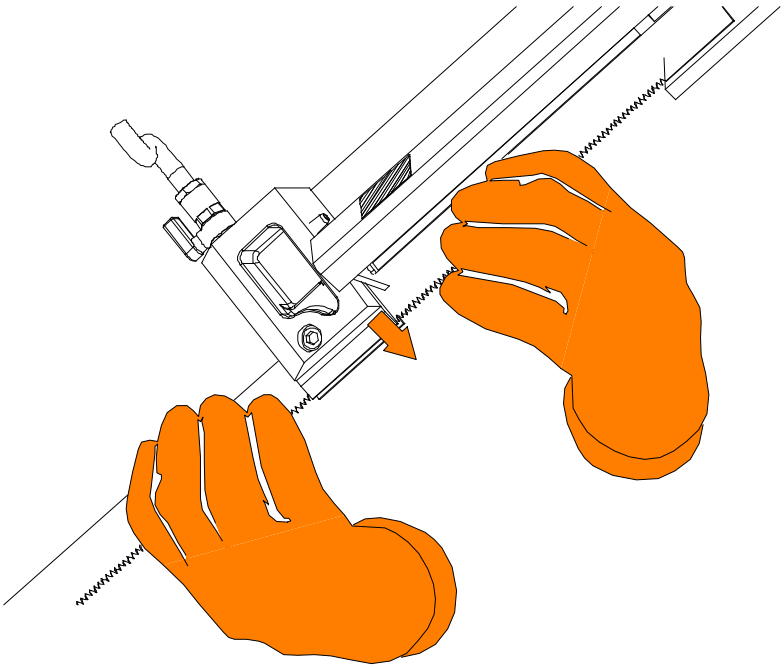
Thanks to the widia inserts, the working life of the guide plates is practically the same as that of the machine itself. However, if due to wear or the assembly of a new blade with a different thickness, the amount of play between the plates and blade changes, the plates must be adjusted as follows:

▶ disconnect the machine from the power supply;

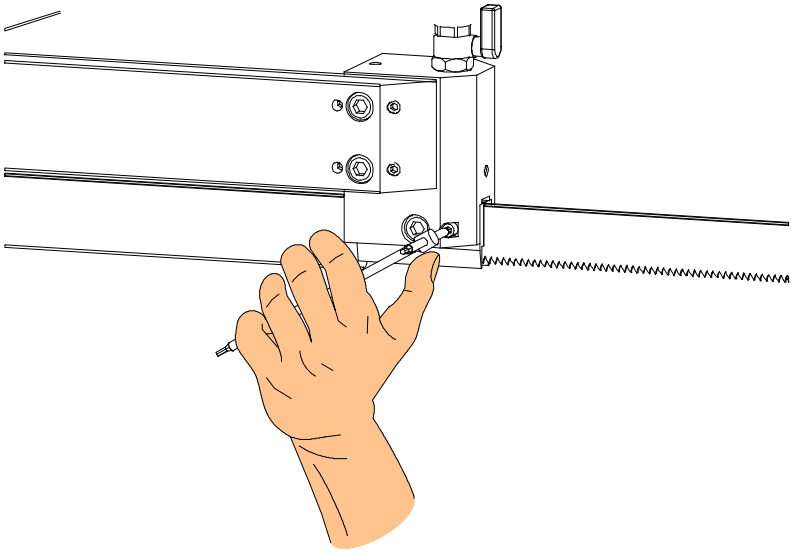
- slacken the blade tension using the handwheel;
- open the front blade guard by undoing the fixing screw and rotating it as illustrated in the figure below;



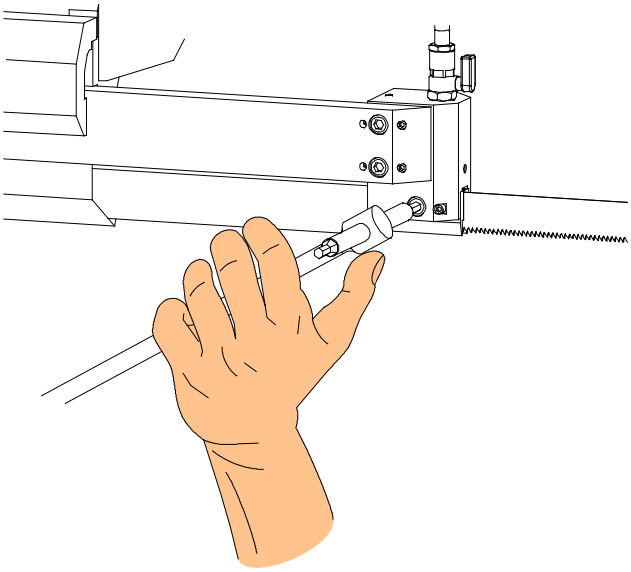
- wear protective gloves when making this adjustment;
- make sure there is a small amount of play between the blade and guide plate inserts;



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



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



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

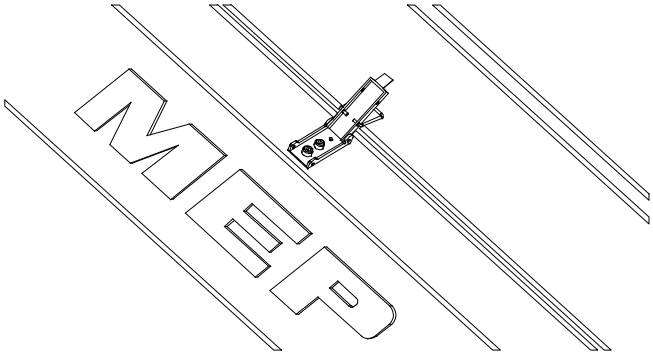
Blade

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

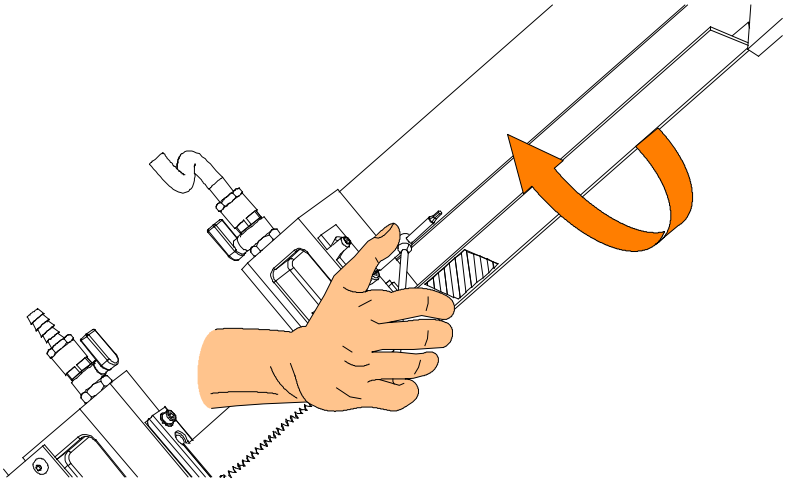
Tool change

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

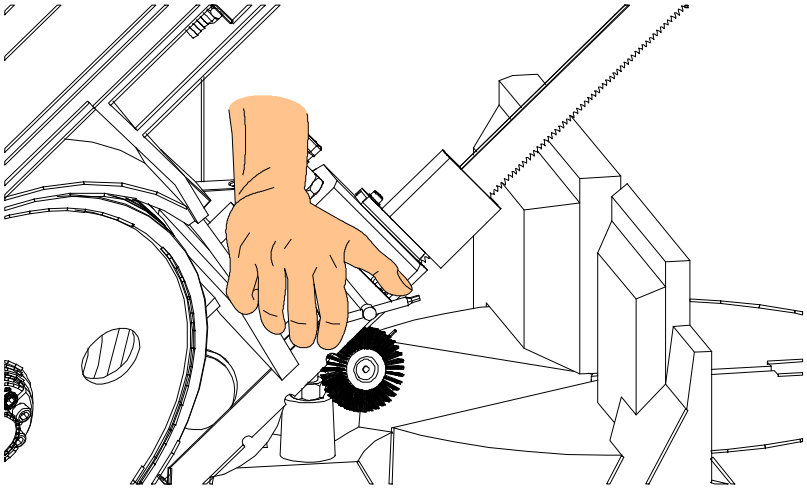
- disconnect the machine from the power supply;
- slacken the blade tension using the handwheel;
- open the cutting head cover by unscrewing the two knobs and hooking it onto the galvanised lever on the back of the head;



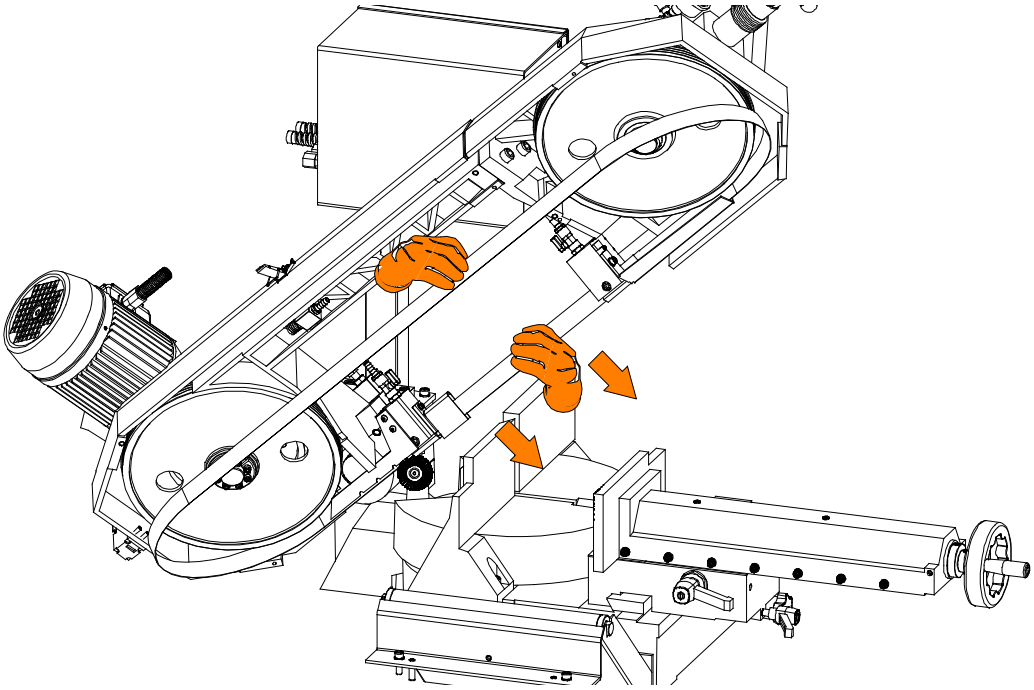
- open the front blade guard by undoing the fixing screw and rotating it as illustrated in the figure below;



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



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

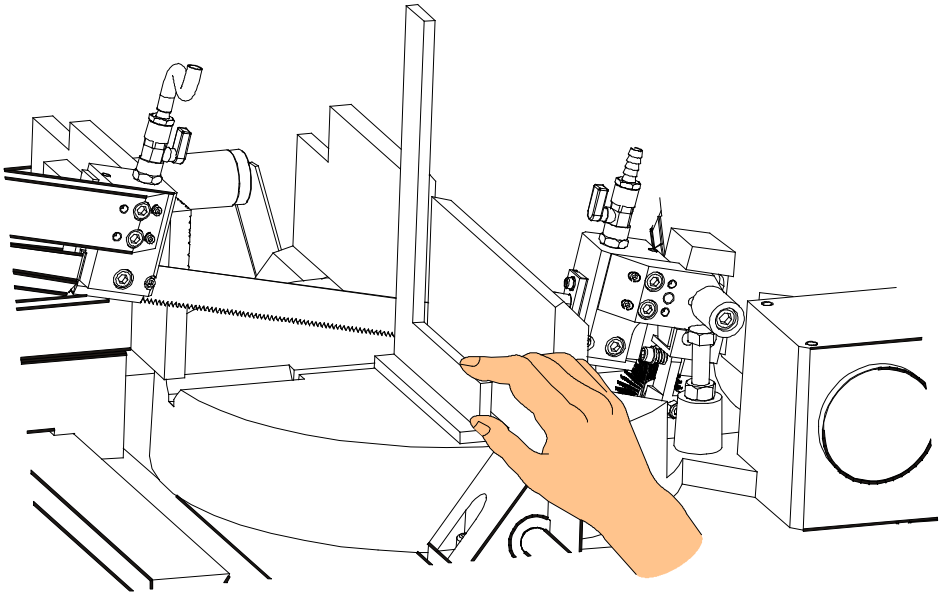


- repeat the above sequence of steps on the rear blade guide head;
- fit the blade on the flywheels and remount the front and rear blade guards;
- close the cutting head cover, correctly tension the blade and power up the machine.

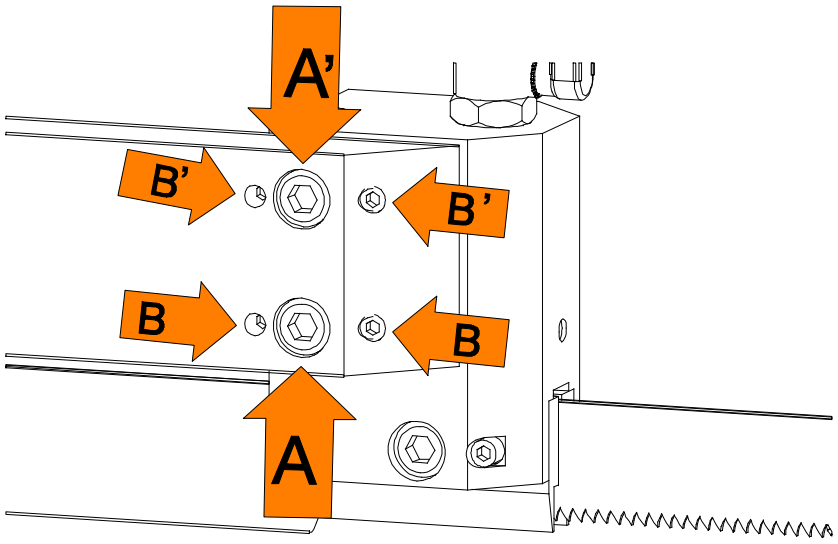
Blade perpendicularity

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

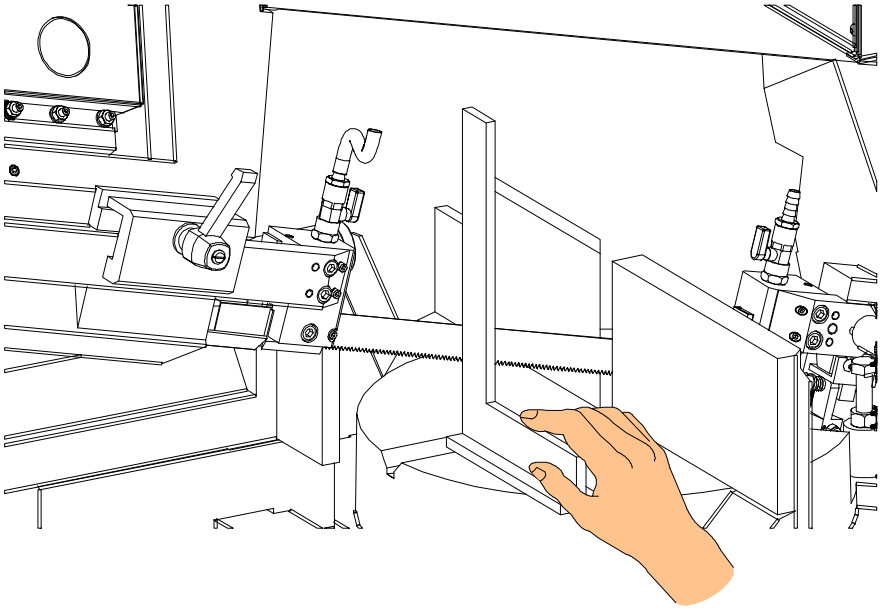
▶ Position the square on the cleaned work surface and rest it against the blade, close to the right vice jaw at a point where the blade teeth do not prevent contact.



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



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



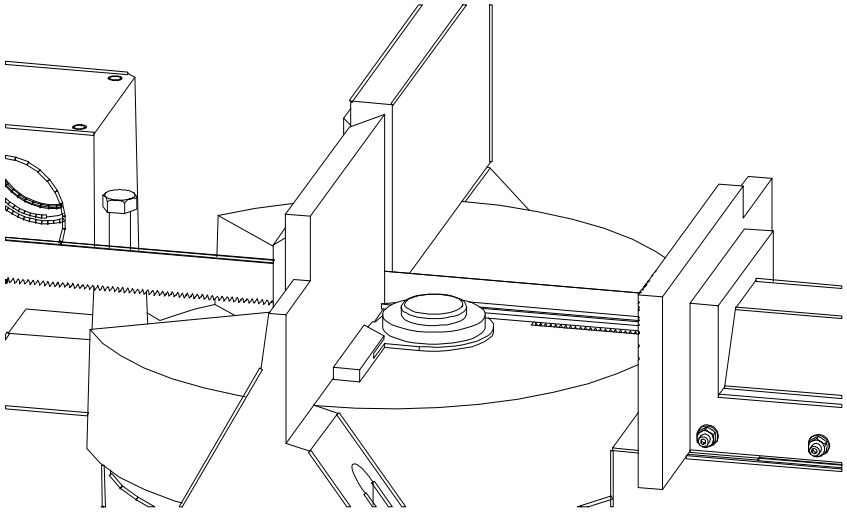
▶ Repeat the squaring operations as for the rear head.

Orthogonality of the blade

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

▶ lower the head;

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

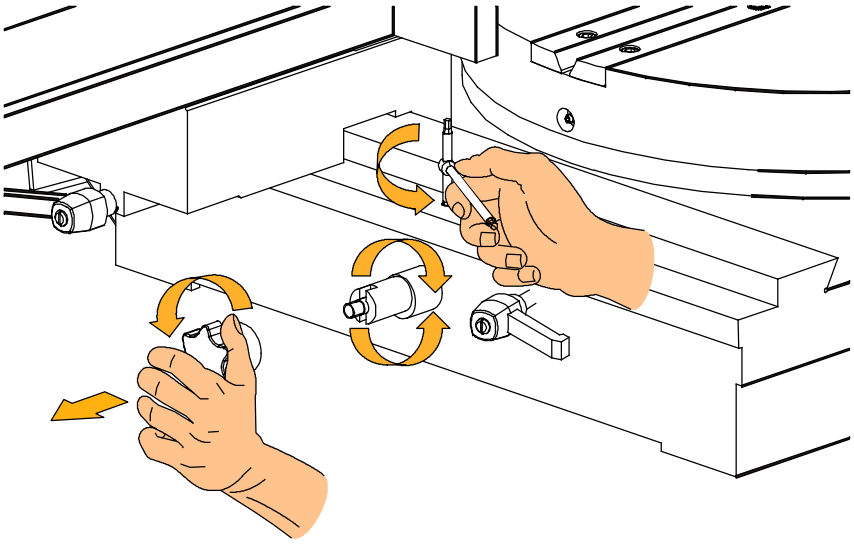


▶ slacken the turntable lock lever;

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

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

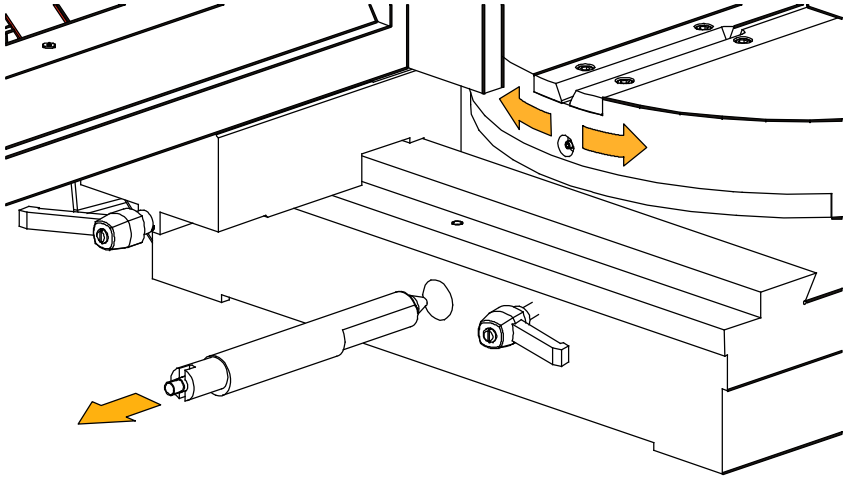
▶ using an Allen key, slacken the eccentric pin grub screw and rotate it until the error is corrected;



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

▶ remove the eccentric pin completely;

▶ turn the head until the error is corrected;



▶ refit the eccentric pin, tighten down the grub screw and remount the knob;

▶ lock the turntable using the lever.

Warning

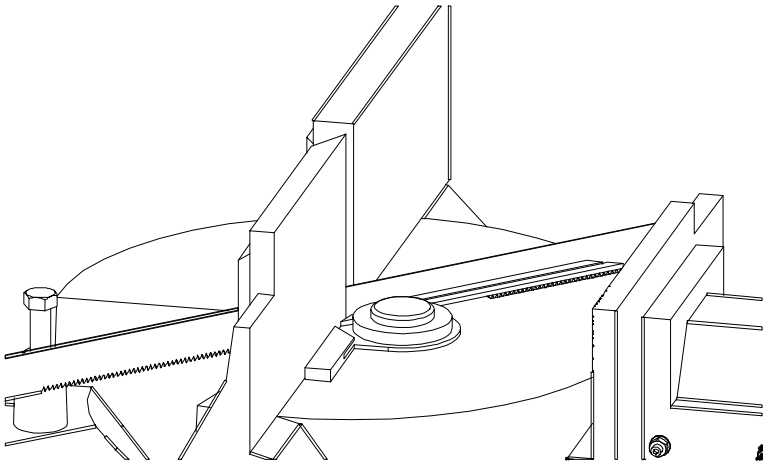
To adjust the 45° and 60° fixed points, you will need a workshop goniometer or an instrument that can measure the exact angle of the blade. This operation can also be performed to adjust the blade to 45° right, since a head angle control pin is also mounted on the left hand side of the work table.

Operation sequence for blade adjustment to 45 degrees:

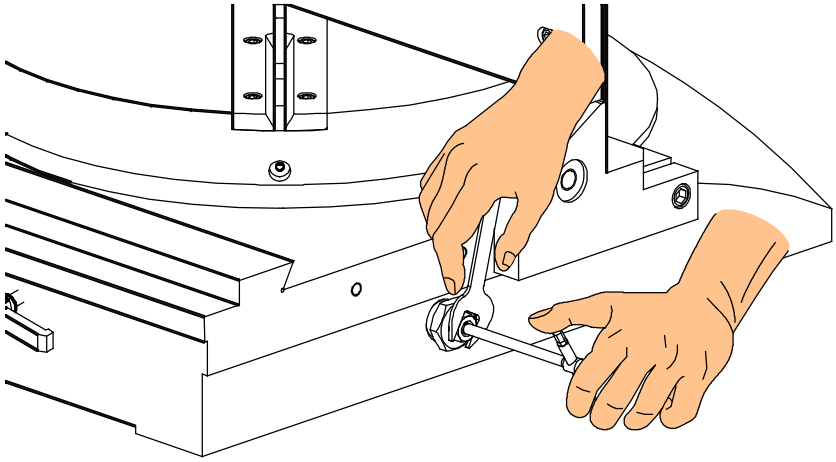
▶ slacken the turntable lock/release lever;

▶ turn the head to 45 degrees (left or right);

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

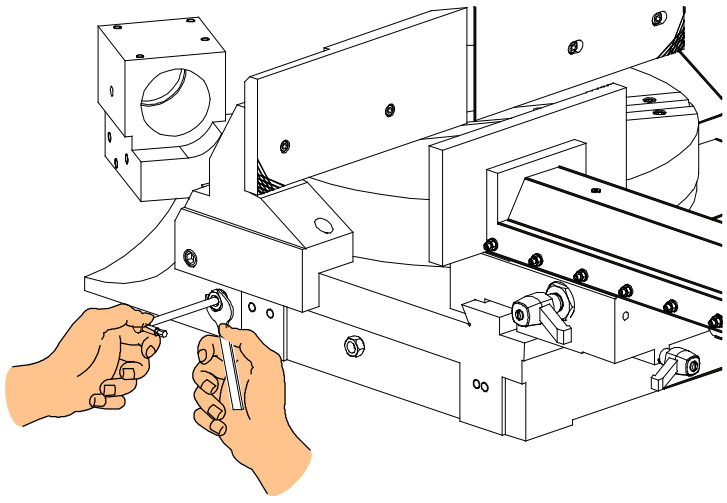


- once you have identified the degree of error, adjust the pins by gripping the pin with an Allen key and slackening the lock nut with a normal wrench;
- this done, adjust the depth of the pin inside the turntable until the error is corrected;



- relock the nut, while gripping the grub screw.

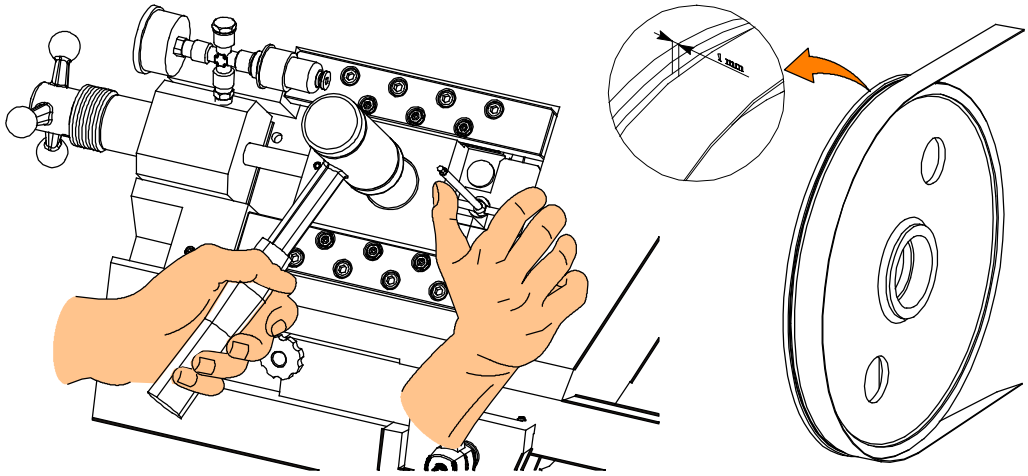
To adjust the blade to **60 degrees left**, proceed as described above for a 45 degree angle, this time however, adjusting the stop indicated in the drawing below.



Front flywheel

The front flywheel must be adjusted so that it is aligned with the rear wheel. The purpose of this adjustment is to make sure the back of the blade remains about 1 mm from the edge of the flywheel during rotation. This prevents premature wear to the blade which, due to excessive friction with the edge, may crack.

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

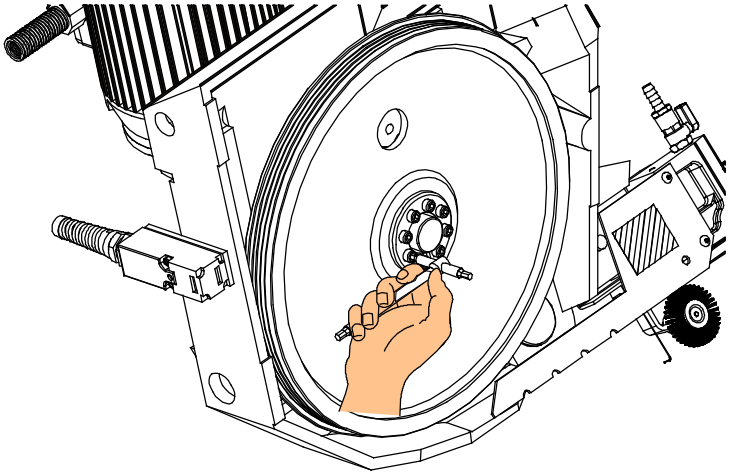


- if necessary, repeat the above operation until a gap of 1 mm is obtained between the back of the blade and edge of the wheels.

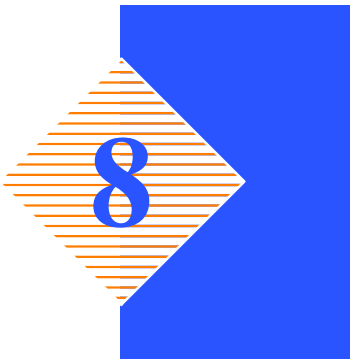
Motor flywheel

Rear flywheel alignment is closely linked to adjustment of the front flywheel. As before, the purpose of this adjustment is to ensure that the back of the blade remains about 1 mm from the edge of the wheel during rotation.

▶ To adjust, slacken all the locking screws on the flywheel and manually move it in or out until the blade is correctly distanced from the edge of the wheel. Re-tighten the screws and check alignment by rotating the blade a few times. If necessary, readjust.



Maintenance and choice of consumables



DM12 is built to be sturdy and long- lasting It has no need of any special maintenance, though, like all other tools, it needs adjusting from time to time, especially if not regularly looked over or used without due care.

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

The role of the operator

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

- check that his own work and that of the other operators of the machine always complies with the relevant safety standards. Therefore, check that the safety devices are in position and work perfectly and that personal safety requirements are complied with.
- Ensure that the working cycle is efficient and guarantees maximum productivity, checking:
  - the functions of the main components of the machine;
  - the sharpness of the blade and coolant flow;
  - the optimum working parameters for the type of material.
- Check that the quality of the cut is that required and that the final product does not have any machining defects.

Maintenance requirements

- All ordinary and extraordinary maintenance must be carried out with the power switched off and the machine in emergency condition.
- To guarantee perfect operation, all spare parts must be Hyd- Mech originals.
- On completion of maintenance works, ensure that the replaced parts or any tools used have been removed from the machine before starting it up.
- Any behaviour not in accordance with the instructions for using the machine may create risks for the operator.
- Therefore, read and follow all the instructions for use and maintenance of the machine and those on the product itself.

General maintenance

Daily

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

- remove all swarf from the machine (preferably with a non- fibrous cloth);
- empty the swarf drawer (this is located on the right side of the base);
- top up the lubricant/coolant level;
- check state of blade wear and replace if necessary;
- check the blade cleaning brush, clean and relocate; if worn, replace;
- at the end of the working day, slacken the blade to 5 Bar (70 Kg) tension to prevent unnecessary and damaging stress on the machine.

Weekly

The weekly maintenance operations are as follows:

- remove all swarf;
- clean the vice and lubricate all joints and sliding surfaces with a good quality oil;
- check vice sliding; if it is not precise and has transversal play, adjust as instructed in Chapter 7.
- apply lubricating oil to the rotating platform's internal circuit using ball valve oiler situated in the rear part of the fixed platform.

Monthly

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

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

Maintenance of working parts

DM12 maintenance engineers must pay particular attention to functioning elements such as the blade tensioning cylinder (already considered in chapter 7), loading, the air treatment unit, the pneumatic vice (if AUTOMATIC VICE version) and the hydraulic brake.
The transmission box equipping the machine needs no maintenance.

Consumable materials

Only specified oils must be used for the hydraulic and pneumatic and for lubricant/coolant devices. Below is a list of compatible oils for each of these circuits.

Oils for Cut Control System hydraulic circuit

The machine is supplied with MOBIL DTE 11 oil, ISO and UNI FD 22 symbol. It s application regarding the cylinder head and comparable oils are the same as described for the blade tensioning unit.

Cut Control System:
- tank capacity .0.2 Lt

Oil for transmission box

The machine can be equipped with a worm gear which is permanently lubricated and therefore maintenance- free. This gear type has no filler cap, level checker and drain, as it already contains the correct quantity of synthetic oil, guaranteeing perpetual lubrication of the crown and worm gear. Otherwise, the machine can be equipped with a worm gear having filler cap, level checker and drain to top the oil up if necessary. Below, there is a short list of synthetic oils for permanent lubrication:

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

- transmission box capacity Lt. 0.320

Oil for lubricant/coolant fluid

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

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

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

- tank capacity Lt. 62
- oil concentration 5- 6 %

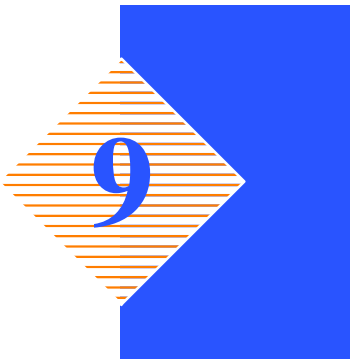
Oils for spray mist system (optional)

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

UNIST Coolube 2210 - FUCHS Plantocut Micro Plus 27

- tank capacity Lt. 1

Cutting speed and choice of tools



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

When using the **DM12**, it is important to select the correct type of blade for the material to be cut. This chapter explains the limitations and specific applications of the different types of blades.

Cutting speed

Standard machine

The basic version with 2/4 pole motor, is provided with the following cutting speeds:

- 1st speed = 40 m/min. (4 pole)
- 2nd speed = 80 m/min. (2 pole)

These speeds are selected using the polarity change switch situated on the control panel.

Machine with 4/8 pole motor (optional)

The machine can be provided with the optional 4/8 pole spindle motor, which supplies the following cutting speeds:

- 1st speed = 20 m/min. (8 pole)
- 2nd speed = 40 m/min. (4 pole)

Machine with Inverter (optional)

The inverter is an electronic instrument fitted to the **DM12** for varying spindle motor rpm. The inverter makes life easier for the operator carrying out special cutting tasks by enabling a changing of rotation speed to suit the kind of material being cut. Blade use can thus be optimised, inasmuch as a blade not especially suitable for cutting a certain material can be adjusted all the same to the task, and premature wear is avoided.

The characteristics of this instrument will now be described and illustrated, as in the “Machine specifications” section.

- 1st speed from 20 to 45 m/min
- 2nd speed from 35 to 90 m/min

Inverter technical specifications	
Protection rating	IP 31
Vibration and shock resistance (EN50178)	0.6 gn from 10 to 50 Hz 2 gn from 50 to 150 Hz
Max. relative humidity	93% without condensation or drop- forming
Acceptable Temperature Range (EN 50178)	For warehouse storing: from - 25° C to +65° C For operating purposes: from - 10° C to +40° C
Max. altitude	1000mt. with no derating
Supply	- single phase: 200V - 15% to 240V + 10%
	- three phase: 200V - 15% to 230V + 10% 380V - 15% to 460V + 10%
Frequency	50/60 Hz ± 5%
Output voltage	Maximum voltage equal to the supply voltage
Output frequency range	0,5 a 320 Hz
Max. transients	150% of electronic speed control rated current for 60 secs.
Frequency resolution	- Display: 0.1 Hz - Analog inputs: 0.1 Hz per 100 Hz max.
Switching frequency	Adjustable from 2.2 to 12 Hz max.
Electronic speed control protection and safety devices	Galvanic insulation between power and control panel
	Short circuit protection: - of available internal supplies; - between U- V- W output phases between phase and earth for calibres from 5.5 to 15Kw
Motor protections	Thermal protection against overheating and overcurrents
Motor protections	Protection integrated in the electronic speed control with 1^2t calculation
	Protection integrated in the electronic speed control with 1^2t calculation
Motor protections	Protection integrated in the electronic speed control with 1^2t calculation

Choice of blade

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

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

Saw tooth pitch

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

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

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

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

Cutting speed and downstroke speed

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

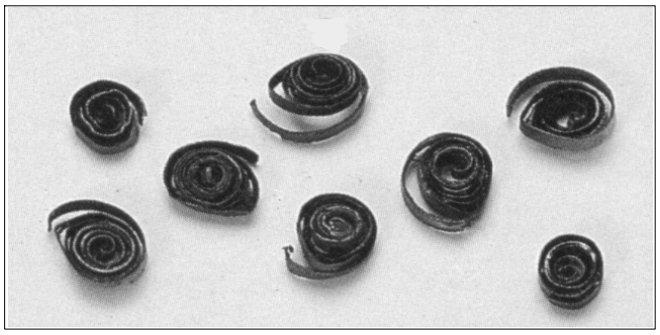
The cutting speed depends, as indicated above, on the tensile strength of the material (kg/mm^2), its hardness (HRB) and the thickness of largest sections. The downstroke speed depends on the material thickness. Therefore, large- section, solid or thick- walled materials (s > 5 mm), can be cut at high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

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

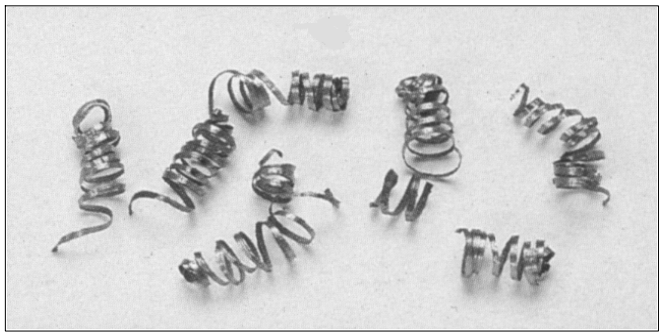
Types of swarf:

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

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

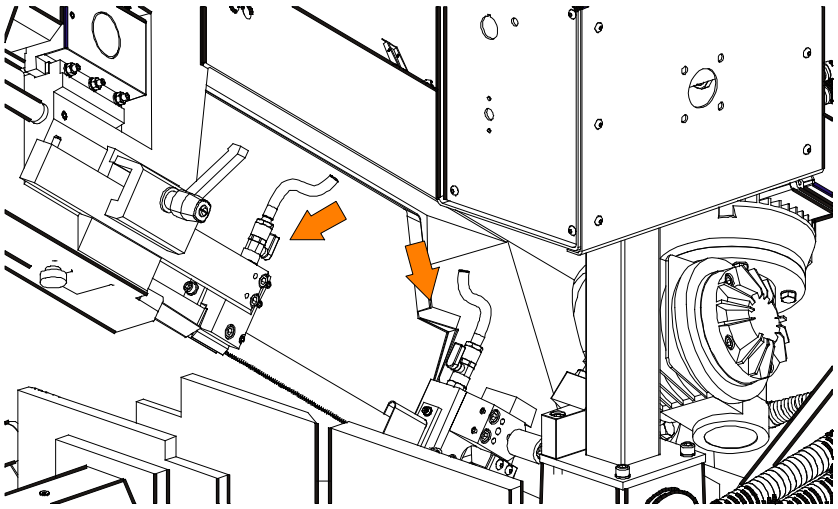


- Long coils of swarf indicate ideal cutting conditions.



Lubricant/coolant fluid

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

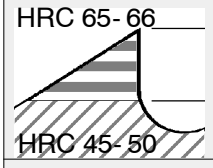
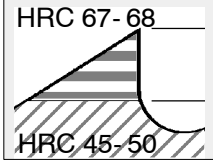


Blade structure

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

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

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

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

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

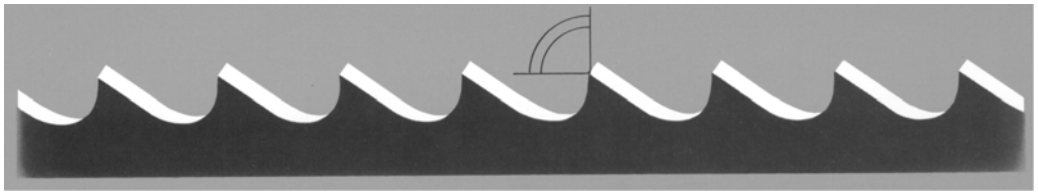
Blade types

The blades mounted on the **DM12** are 3.320 x 27 x 0,9 mm.; the length can vary between 3.350 mm. and 3.290 mm., thanks to the blade tensioner device. The blades, however, apart from size and tooth pitch, are differentiated by other geometrical characteristics which determine their specialised uses:

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

Conventional rake

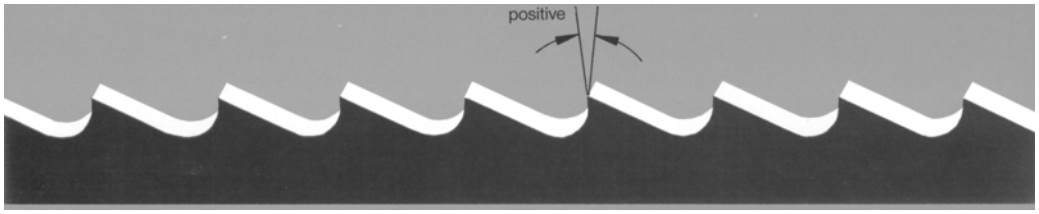
Cutting angle 0° , constant pitch.



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

Positive rake

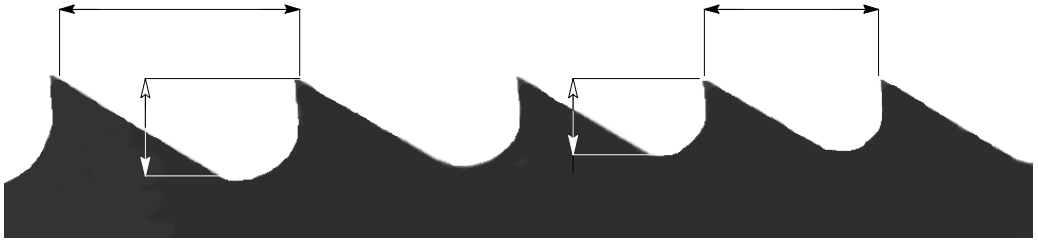
Positive cutting angle 9- 10° , constant pitch.



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

Variable pitch

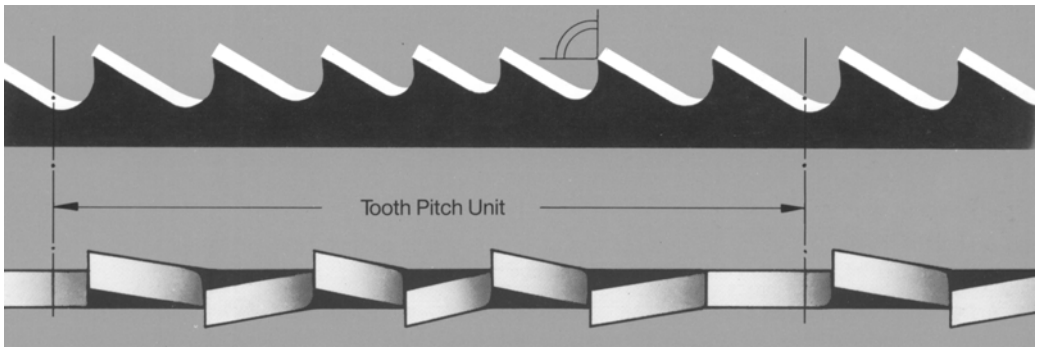
These blades have groups of teeth having different pitches and, as a consequence, have various tooth dimensions and differing relief angles. These are also available in M2 and M42 types with zero and positive rakes. The alternation of the different types of teeth helps to prevent vibration and noise.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



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

Variable pitch blades with 0° cutting angle

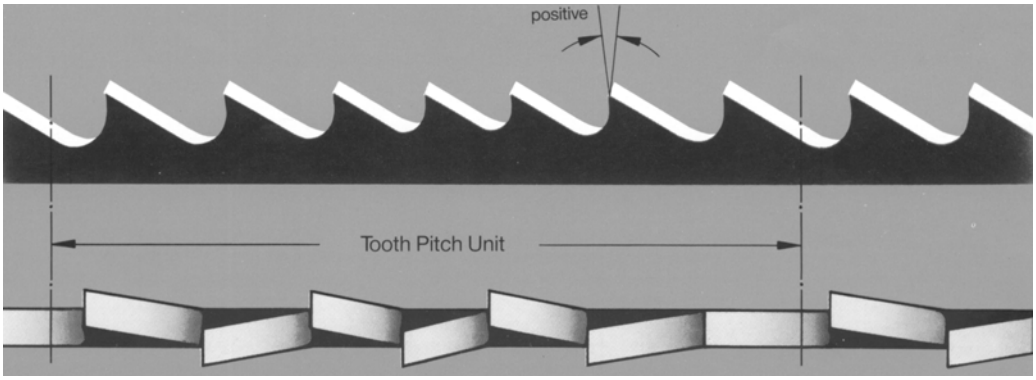
This type of tooth formation is ideal for cutting single pipes or medium size bundles, in accordance with the capacity of the machine.



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

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

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



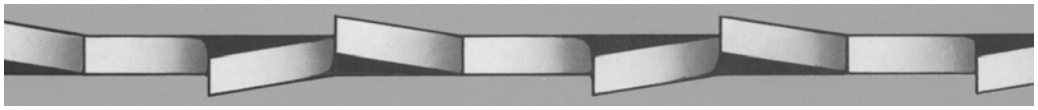
Pitches available: 3- 4 / 4- 6.

Set:

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

Standard or splayed set

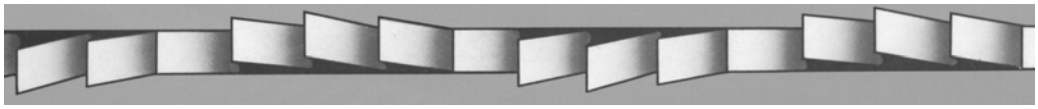
This term is used to describe an alternated angling of the teeth: one to the right, one to the left and one straight.



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

Undulated set

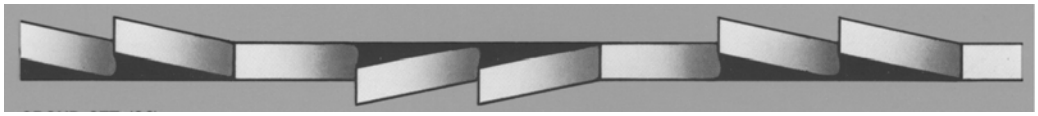
Used to describe groups of teeth undulating alternatively to the right and left.



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

Alternating grouped sets

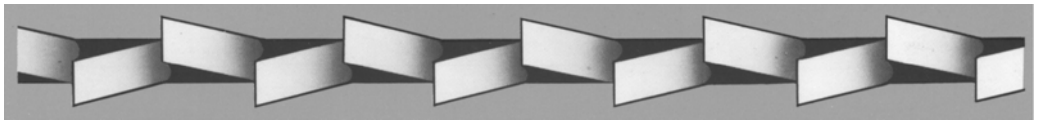
These are groups of teeth angled to the right, one straight tooth, then a further group angled to the left.



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

Alternating set

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



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

Blade selection table relating to cutting speed and downstroke speed

Cutting material	Cutting speed mt./min	Dimensions of the cutting section S (mm) S<10		10<S<30		30<S<50		50<S<80		80<S<120		120<S<230		Lubrication	sq. mt./min. cut
Structural steel Casehardened steel Steel for turning Mild steel	50 / 70	14	10 / 14	10	10 / 14	8	6 / 10	6	5 / 8	4	4 / 6	3	3 / 4	Emulsible oil Cutting fluid	60 - 70
High- duty cast iron Rolled steel Spring steel	40 / 50	14	10 / 14	10	10 / 14	8	6 / 10	6	5 / 8	4	4 / 6	3	3 / 4	Emulsible oil	50 - 60
Alloy steel Tool steel Valve steel	30 / 40	14	10 / 14	10	10 / 14	8	6 / 10	6	5 / 8	4	4 / 6	3	3 / 4	Emulsible oil Cutting fluid	15 - 20
Stainless steel Nodular cast iron	30 / 40	14	10 / 14	10	10 / 14	8	6 / 10	6	5 / 8	4	4 / 6	3	3 / 4	Emulsible oil	15 - 20
Copper Soft bronze	90 / 150	14	10 / 14	10	10 / 14	6	5 / 8	4	4 / 6	3	3 / 4	3	3 / 4	Emulsible oil	75 - 90
Brass	90 / 300	14	10 / 14	10	10 / 14	6	5 / 8	4	4 / 6	3	3 / 4	3	3 / 4	Emulsible oil	80 - 90
Hard bronze	20 / 40	14	10 / 14	10	10 / 14	6	5 / 8	4	4 / 6	3	3 / 4	3	3 / 4	Emulsible oil	25 - 40
Aluminium	80 / 800	14	10 / 14	6	10 / 14	4	4 / 6	3	3 / 4	3	3 / 4	3	3 / 4	Emulsible oil	70 - 80
Plastics	90 / 400	14	10 / 14	6	10 / 14	4	4 / 6	4	4 / 6	3	3 / 4	3	3 / 4	Emulsible oil	80 - 90

Blade pitch **Number of teeth per inch**

Classification of steels

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

Types of steel				Hardness		
UNI	DIN	BS	AISI	Brinell HB	HRB	Kg/mmq
C 22 - C 35	CK 22 - CK 3	En 2 C - En 6	1022 - 1035	160 - 170	34 - 87	55 - 59
C 45	CK 45	En 8	1040	160 - 180	84 - 89	55 - 61
C 10 - C 15	CK 10 - CK 15	En 32 A - 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

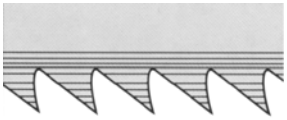
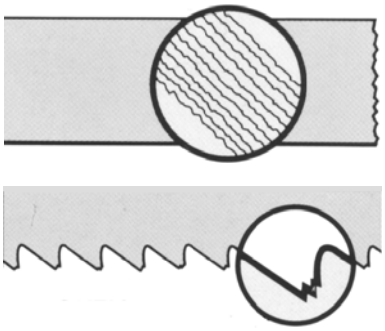
Material	SS Svezia	AISI U.S.A.	DIN Germania	BS Inghilterra	UNI Italia	AFNOR Francia
Carbon steels	1311 1572	1015 - 1035	C 22 - C 35 20 Mn 5 - 28 Mn 6 CK 22 - CK 50	050 A 20 080 M 46 - 50 120 M 19 150 M 28	C 15 - C 35 C 22 Mn C 28 Mn	XC 18 XC 38 H 1 20 M 5
Carbon steels	1650 1880	1040 - 1064 1770 - 1880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

Troubleshooting

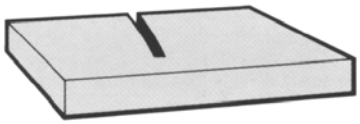
10

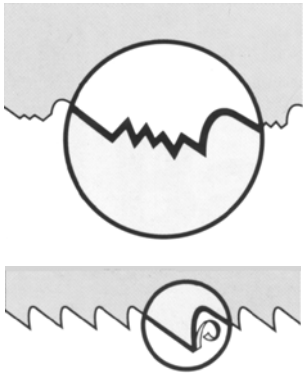
This chapter describes the inspection and troubleshooting procedures for the **DM12**. Regular inspections and efficient maintenance are essential to ensure your machine gives you a long, trouble- free service life. The chapter is divided into two sections: the first being dedicated specifically to TROUBLESHOOTING BLADE AND CUTTING PROBLEMS, while the second TROUBLESHOOTING section concerns troubleshooting general machine operating faults. Taken together they form a comprehensive troubleshooting guide which will enable you to follow a methodical procedure for solving any problem.

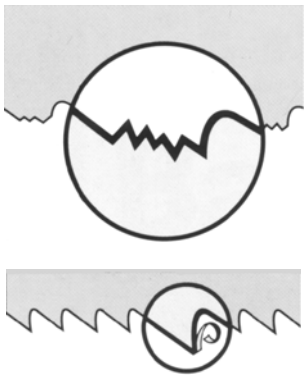
Troubleshooting blade and cutting problems

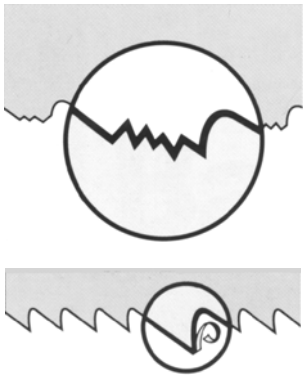
PROBLEM	PROBABLE CAUSE	SOLUTION
Blade scored or scratched 	◗ Widia inserts chipped or worn	☞Replace
	◗ Widia inserts loose or tight	☞Adjust
	◗ Widia inserts dirty	☞Clean and re- adjust correctly
Cutting surfaces scored 	◗ Blade teeth worn	☞Replace blade
	◗ Head downstroke speed too fast	☞Reduce downstroke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

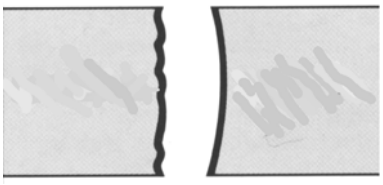
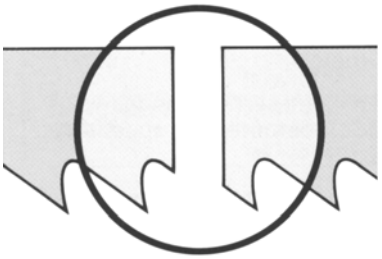
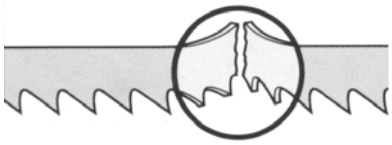
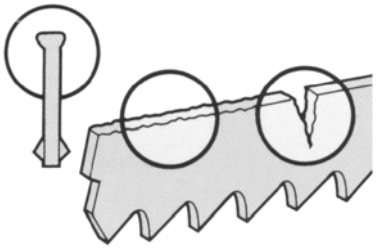
PROBLEM	PROBABLE CAUSE	SOLUTION
Rapid tooth wear 	◗ Teeth pointing in the wrong direction	☞Set teeth in correct direction
	◗ Blade worn in wrongly	☞With a new blade cutting should be done at half- speed and with downstroke speed also at half normal speed. After the blade has been worn in (about 300 cm^2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

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

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

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

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

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

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

Troubleshooting machine faults

PROBLEM	PROBABLE CAUSE	SOLUTION
The main switch does not work	◗ Electrical supply	☞Check: phases, cables, plug, socket.
	◗ Minimum voltage relay	☞Check that it is correctly supplied and not burnt out.
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.
	◗ Motor contactor	☞Check input and output phases and check whether when supplying A1 and A2 relay the contactor closes.
	◗ Polarity change switch	☞Check input and output phases
	◗ Head control lever microswitch	☞Check that it is functioning; if broken, replace
	◗ Blade tensioning	☞If the blade is not correctly tensioned to 60 Bar, the pressure contact does not close and the machine is in EMERGENCY state
	◗ Blade protection cover	☞Check that the closure is correct and the limit stop pressed
	◗ Current drop	☞Check connections on the handgrip switch, the blade protection limiter and the pressure gauge on the blade tensioner group
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.
Electropump is not working	◗ Electrical supply	☞Check: phases, cables, plug, socket and fuse no. 5 in the electrical plant
	◗ No- return valve	☞Clean, if blocked replace
	◗ Filter	☞Clean

PROBLEM	PROBABLE CAUSE	SOLUTION
The pressure gauge does not give blade tension pressure	◗ Oil level	☞Top up oil level in blade tensioner cylinder
	◗ Blocked connection	☞Check for blockages
	◗ Broken	☞If damaged, replace
Cutting vice will not close or will not open (MA version)	◗ VM: Cutting Vice Valve	☞Make sure the valve is operating correctly, replace if necessary.
	◗ 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.
	◗ Air treatment unit	☞Check that the air treatment group is supplying the pressure shown on the gauge.
The CCS optional is not working	◗ Minimum voltage relay	☞Check that it is correctly supplied and not burnt out
	◗ Selector switch	☞Check connections. Replace if defective
	◗ Lock valve	☞Check for impurities preventing correct functioning. Replace if defective.
	◗ Regulator	☞Check that input and output pipes are free of kinks and obstructions.
	◗ Spring	☞Check that the spring is correctly tensioned
	◗ Cylinder	☞Check that hydraulic circuit oil level is sufficient.
	◗ Limiter	☞Check connections and functioning
	◗ Head control lever microswitch	☞Check connections and functioning

Accessory Installation

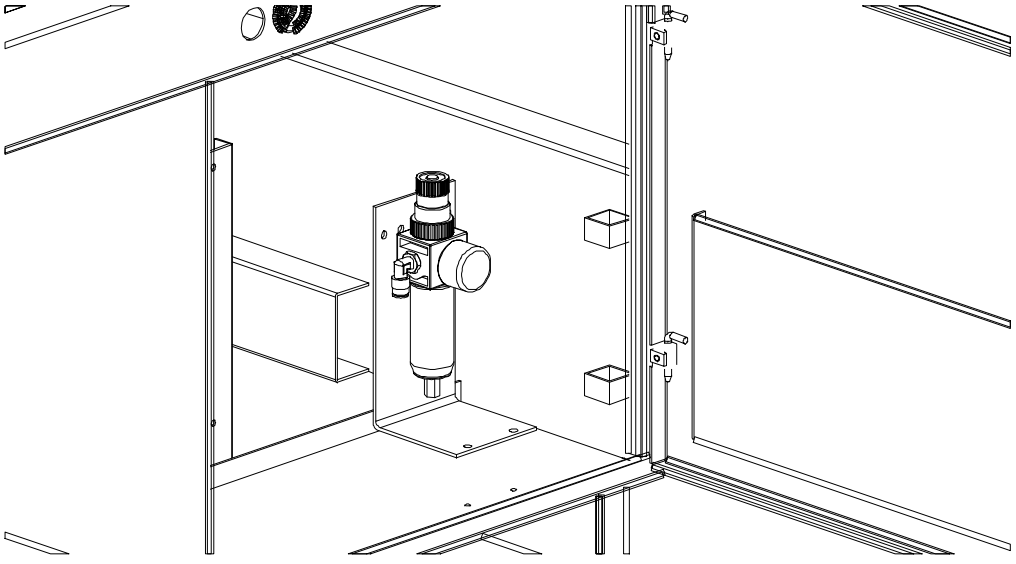
11

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

Automatic vice kit

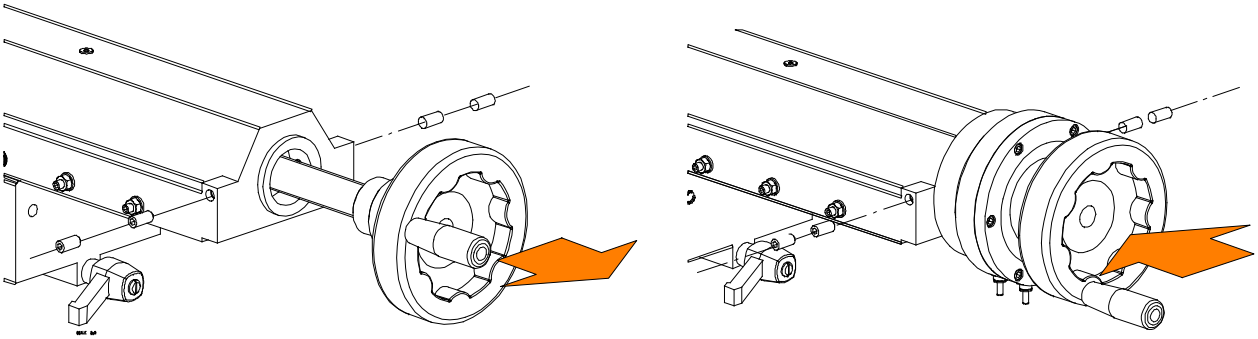
This pneumatic device can be activated by using the selector on the front of the machine base. The machine is set up for the passage of pneumatic pipes, for positioning the pneumatic selector, and for the maximum pressure valve on the air inlet, on the back of the base. To assemble the Automatic Vice, proceed as follows:

- drill two 5 mm holes as shown in the diagram, for fixing the support bracket for the air treatment unit;



- put the pneumatic valve in the base and fix it using the relevant ring nut;

- remove the security dowel and collar from the vice screw bushing as shown in the figure;



- remove the vice screw unit, the bushing and the crank handle from the slide and insert the vice screw unit with the volampress and crank handle included in the kit;
- insert the volampress in its seating and drill two dead holes to tie up with the fixing holes on the slide, and reinsert the dowel and collar;
- connect the pipes and couplings from the kit and check that they are working.

Blade

The blades that can be used on this machine include:

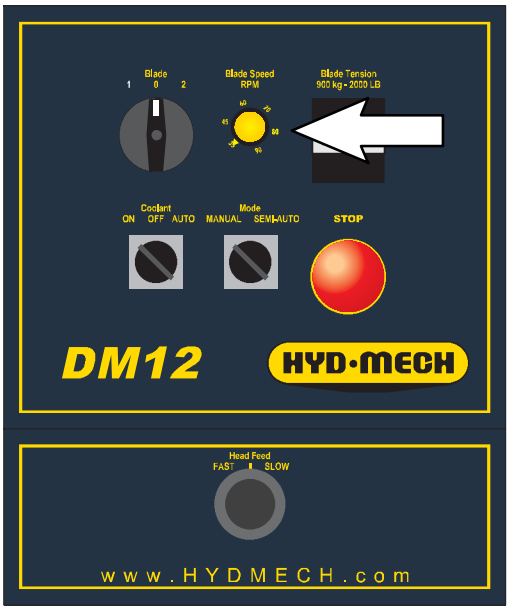
- 3.320 x 27 x 0,9 bimetal blade for solid and section materials;
- 3.320 x 27 x 0,9 bimetal blade for solid and section materials;

See chapter 7 of this manual for belt installation instructions.

Electronic rpm variator (inverter)

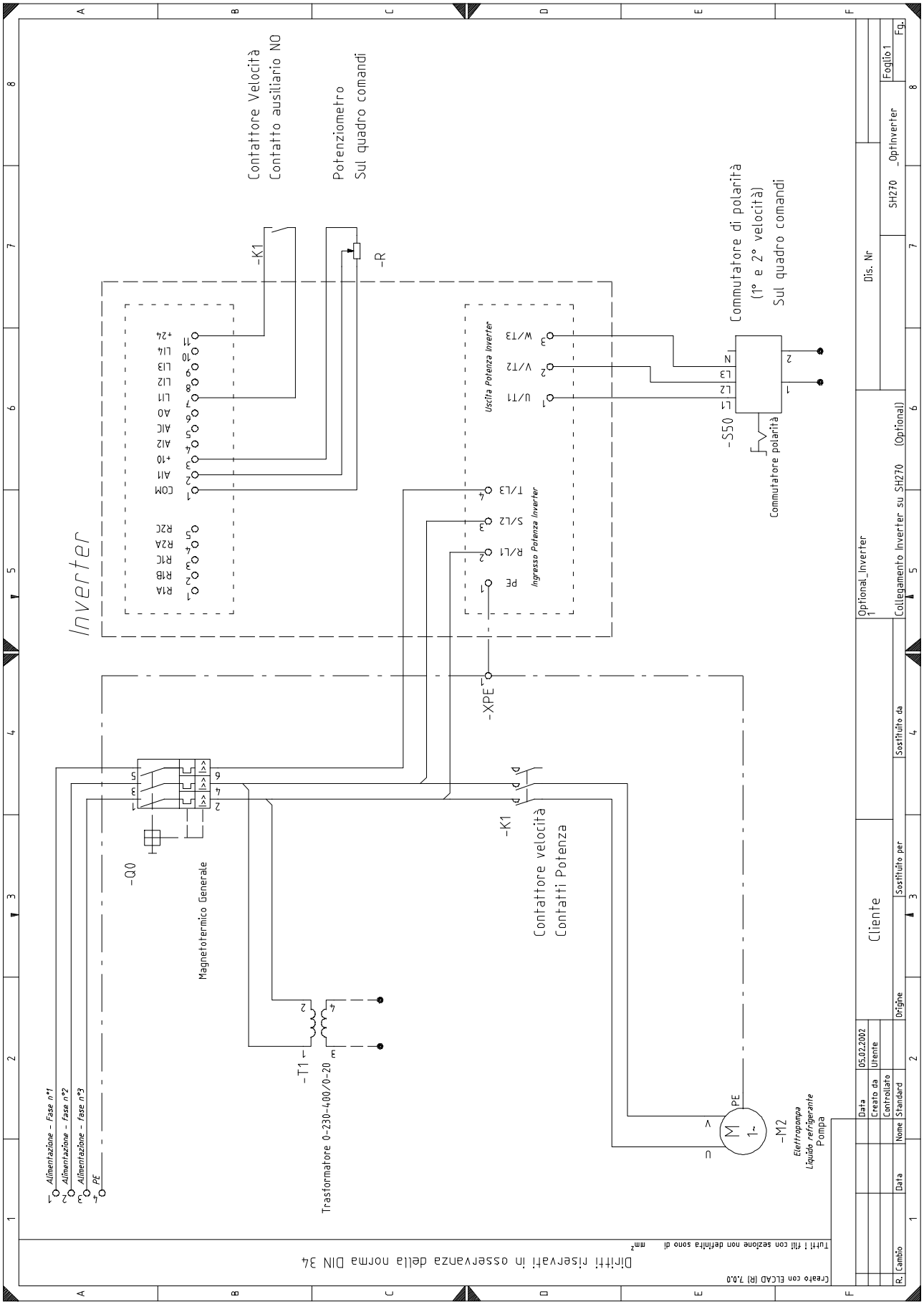
This device provides a speed range of between 20÷90 m/min

- Open the door in the base and fix the inverter to the bottom, positioning it about 10 cm from the rear and right walls. Form two threaded holes for fixing the inverter casing.
- Drill a 22 mm diameter hole in the back of the base near the existing three holes.
- Drill a 22 mm diameter hole in the back face of the control panel, being careful not to damage the electrical equipment inside.
- Drill an 11 mm diameter hole in the front of the control panel at the point fitted for the potentiometer, as shown in the diagram.



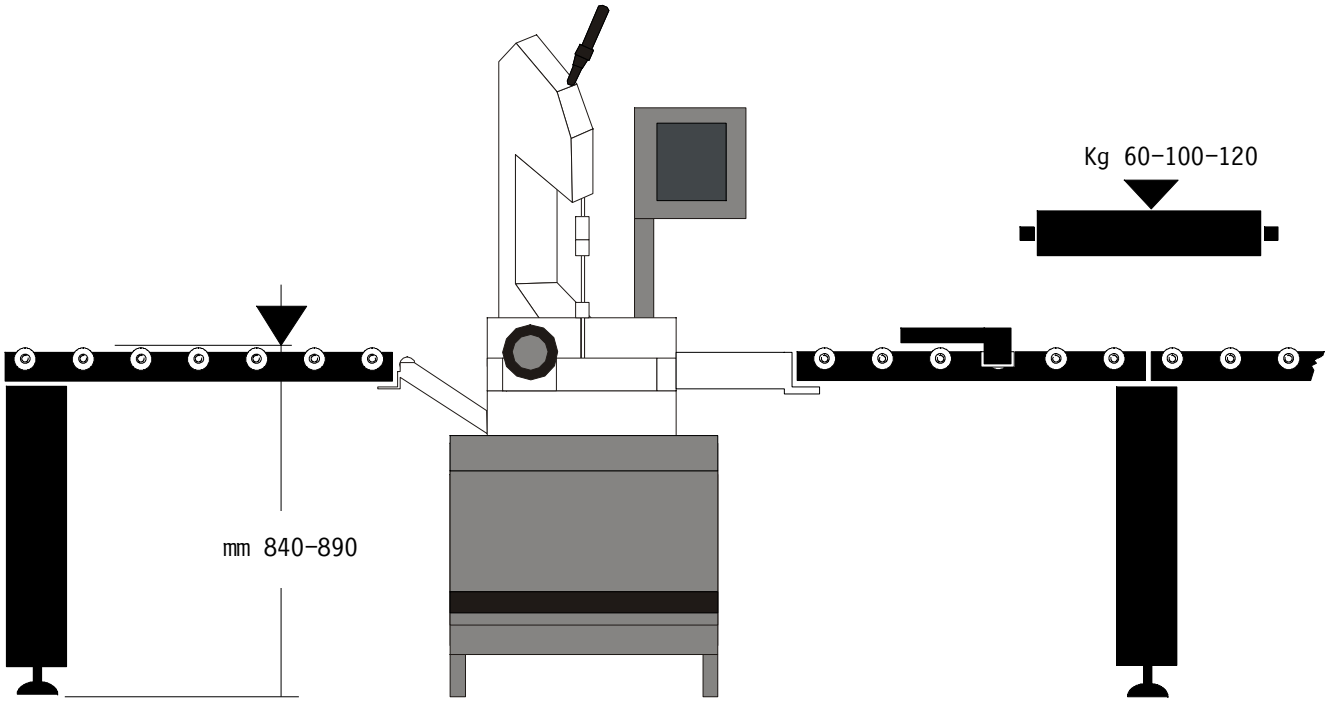
- Insert the cable clamps in the 22 mm holes.
- Pull the electric cables out of the base and feed them through the sheath and feed them into the control panel, then tighten the cable clamps.

- form the connections as shown in the layout below:



Roller table

- K60/K100/K120 roller table module for feed side, 1500 mm;

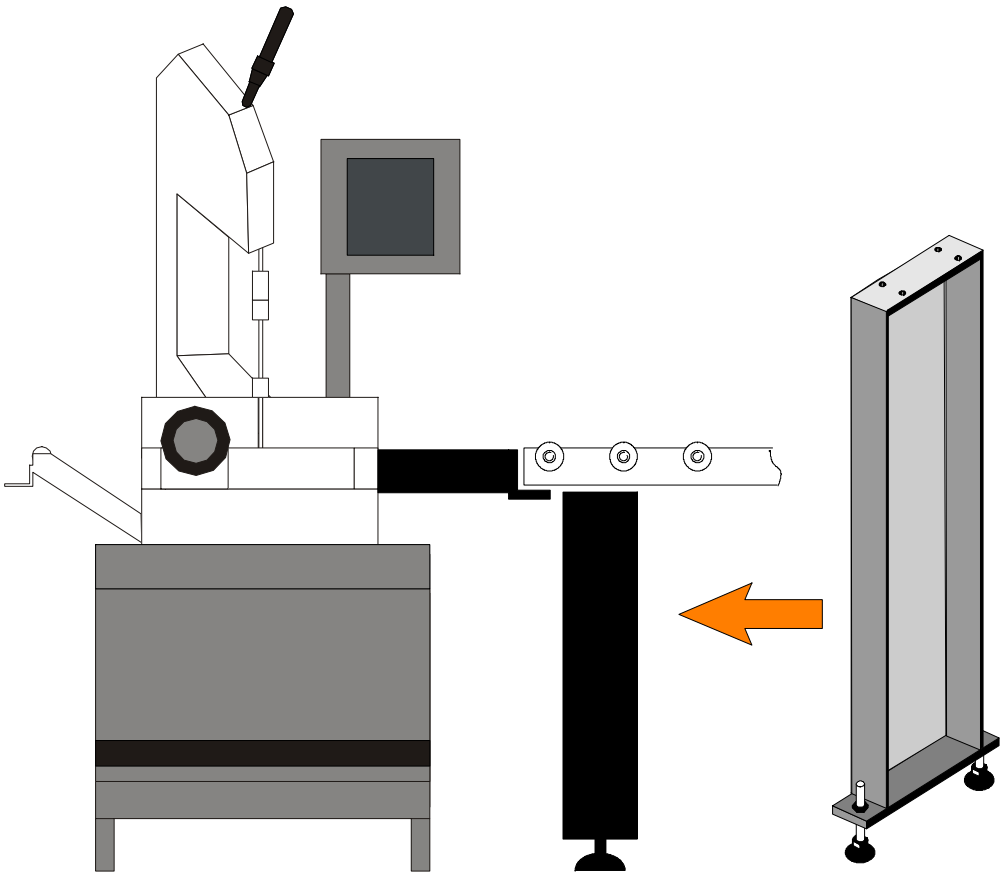


- K60/K100/K120 roller table for discharge side, 1500÷6000 mm;
- K60R/K100R roller table for discharge side, 1500÷6000 mm;
- To fit the roller loading platform on the loading side, the machine has a bar-support arm that one end of the roller-way can be positioned on and then screwed in place.
- To install 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.

Support for the roller platform on the feeding/discharging side

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);

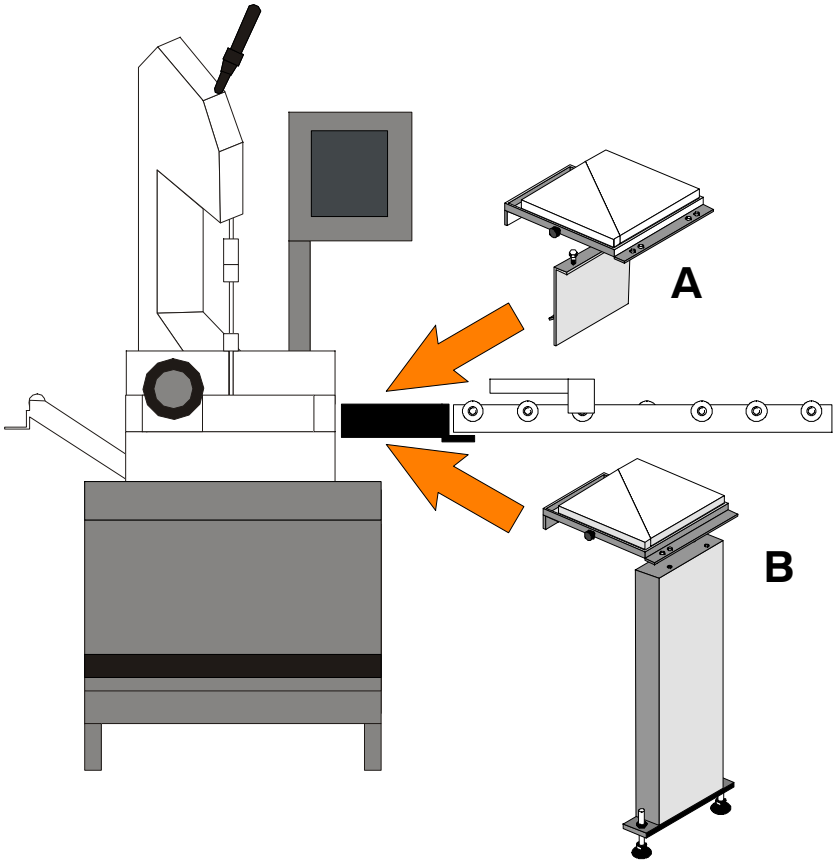


▶ Position the support to correspond with the holes on the base of the trailer and reconnect to the adapter.

Discharge side roller table adapter with support

The installation operations are given below:

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



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

Warranty

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

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

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

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

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

HYDMECH GROUP LIMITED
1079 Parkinson Road
P.O. BOX 1659
Woodstock, Ontario
N4S 0A9

Sales Toll Free: 1- 877- 276- SAWS (7297)
Phone: (519) 537- 2103
Fax: (519) 539- 5126
Website: www.hydmech.com
e- mail: info@hydmech.com

The Rock Solid Solution

Through its twinned distribution channel of authorized dealers and factory rapresentatives, HYD-MECH services worldwide network of customers from its two state-of-the-art manufacturing facilities in Houston, Texas, USA and Woodstock, Ontario, Canada. Check out the full range of Rock Solid Sawing Solutions at www.hydmech.com

HYD-MECH GROUP LIMITED
1079 Parkinson Road, P.O. BOX 1030
Woodstock, Ontario, Canada N4S 8A4
Sales toll free: 1-877-276-SAWS (7297)
Telephone: (519) 539-6341
Fax: (519) 539-5126

Customer service toll free: 1-877-237-0914 - PARTS FAX:(519) 539-5099 - WEBSITE: www.hydmech.com - E-MAIL: info@hydmech.com