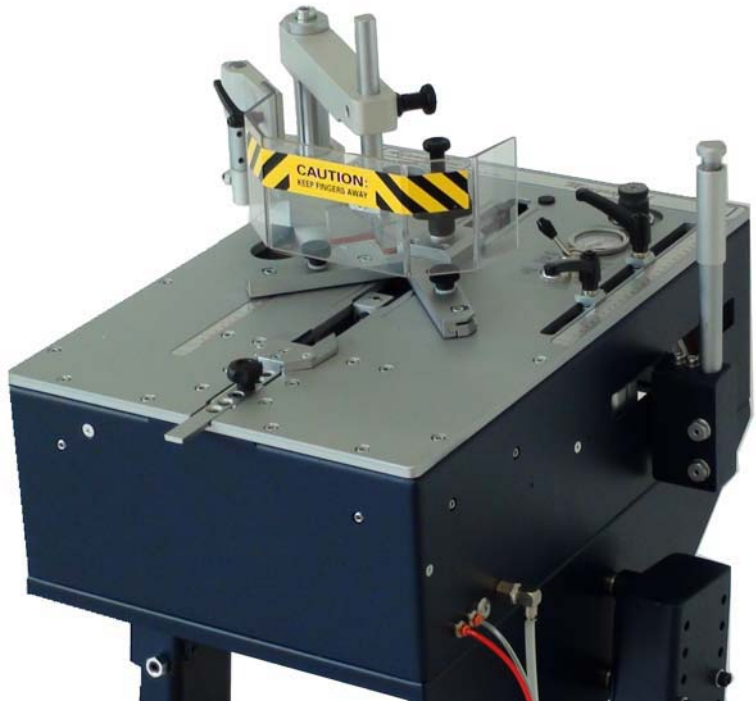
Alfamacchine
Technology for frame assembly

EN

INSTRUCTION MANUAL



Minigraf M144

Name	**FRAME ASSEMBLING MACHINE**
Function	**ASSEMBLY OF FRAMES BY INSERTION OF METAL V-NAILS**
Model / Type	**Minigraf - 144**
Serial number	
Year of construction	**2011**
Manual Revision	**01**

PLEASE RETAIN FOR FUTURE REFERENCE

Alfamacchine S.r.l.
Via Selva 23/25
47122 Forlì - Italy

CE DECLARATION OF CONFORMITY

The Manufacturer with registered headquarters in **Alfamacchine S.r.l. Via Selva, 23/25 47122 Forlì - Italy**

HEREBY DECLARES

under its sole responsibility, that the machine:

Name: FRAME ASSEMBLING MACHINE
Function: ASSEMBLY OF WOODEN - SYNTHETIC - MDF MOULDINGS USING METAL V-NAILS
Model: **MINIGRAF 144**
Type: PNEUMATIC
Serial number:

COMPLIES WITH THE PROVISIONS STIPULATED IN THE FOLLOWING DIRECTIVES:
- 2006/42/CE, Machinery Directive

as it meets all the relative essential health and safety requirements for the product in question.

Technical File drawn up by: ALFAMACCHINE S.R.L.

Forlì

_____
Date

_____
Signed by the Legal Representative (NICOLA GERMANÒ)

EN TRANSLATION OF THE ORIGINAL INSTRUCTIONS

TABLE OF CONTENTS

DANGER - WARNING
BEFORE USING THE MACHINE PLEASE READ THIS MANUAL CAREFULLY SO THAT YOU BECOME FAMILIAR WITH THE MACHINE, ITS ENVISAGED USE AND ANY RISKS ASSOCIATED WITH IT.

Keep the Instruction Manual in good condition: Remember, it is an integral part of the machine. Always refer to the manual to get best machine performance in maximum safety while performing the operations described herein.
This manual must be kept in an easily accessible place, near the machine, at all times so that it can be consulted whenever necessary.

DANGER - WARNING
USE THE MACHINE SOLELY AND EXCLUSIVELY FOR THE USES INDICATED AND IN ACCORDANCE WITH THE RECOMMENDATIONS PROVIDED IN THIS MANUAL. NEVER TAMPER WITH IT, FORCE IT OR USE IT IN ANY INAPPROPRIATE MANNER.

1. INTRODUCTION TO USE

1.1. HOW TO CONSULT THIS MANUAL AND THE SYMBOLS ADOPTED

Please pay particular attention to the words “DANGER – WARNING”, “DANGER – CAUTION” and “NOTES” as used in this manual.
To draw the user’s attention to certain information and provide warning messages, the operations described in this manual are accompanied by symbols and notes to highlight the presence of any hazards and indicate the safe use of the equipment. These symbols and notes belong to various categories, as indicated below:

DANGER – WARNING: IMPORTANT INFORMATION CONCERNING GENERAL SAFETY.

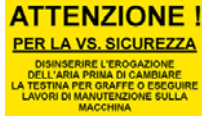
DANGER – CAUTION: highlights situations where careful and sensible actions are essential.

NOTES: information of a technical nature.

1.2. WARNING - SAFETY ALERT DECALS (see figure)

Decal	Description
	Wear protective glasses
	Wear protective gloves
	Wear safety footwear
	Wear hearing protection
	Risk of impact against obstacles: affixed in the corners of the guards

1.3. TYPE OF USE AND CONTRAINDICATIONS



Safety precautions for machine use

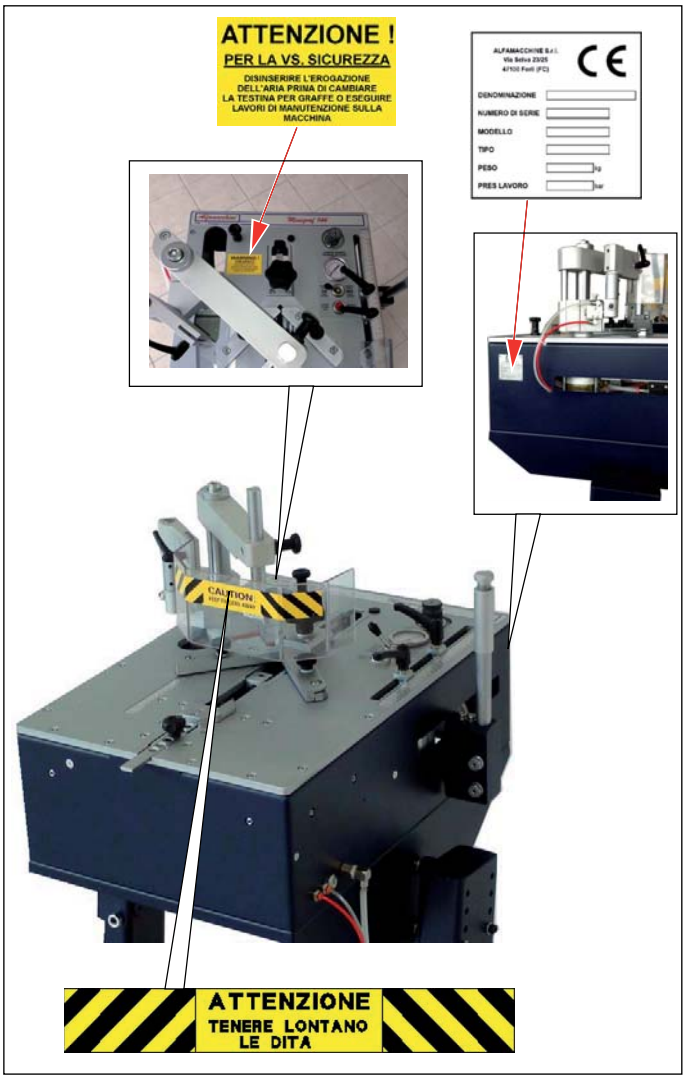
EC dataplate

PERMITTED USE

The machine described herein is designed to be run by 1 operator suitably trained and instructed with regard to residual risks. The operator must have the same skills, in terms of safety, as the maintenance technicians and adequate professional competence.

During its PERMITTED AND REASONABLY PREDICTABLE USE, the machine may be used exclusively:

- to work with wooden mouldings of various hardness, with multiple surface finishes, for the purpose of making frames for pictures, mirrors, display cases, cupboard doors etc.) in accordance with the characteristics described in the heading “Products Processed - Handled or Generated”. Use of the machine to perform processes other than those described in this manual is to be considered improper and therefore strictly prohibited.
- with the products (and materials) described and having the dimensions specified in the heading “TECHNICAL CHARACTERISTICS”.



It is also compulsory:

- for the machine to be used by one operator only who has received adequate training/information concerning machine operations, performance and any hazards associated with its use.
- to ensure no exposed persons are present in the machine’s operating area before proceeding with any operations whatsoever.
- to check the perfect condition of all the safety devices before starting to work with the machine.
- to ensure, when the machine is placed on the factory floor where it is to be used, that it is installed on a level, smooth and perfectly horizontal surface. The floor must have an adequate load bearing capacity to support the weight of the machine.
- to check, prior to starting work with the machine, the conditions of ambient lighting and ensure there are no areas of shadow, glare, or potentially hazardous strobe effects.
- to disconnect, prior to starting any work on the machine, the main compressed air supply, safely discharging any residual energy in the machine circuits, and wait for all parts at high temperatures to cool down adequately.

FORBIDDEN USE

DANGER - WARNING
THE MACHINE MUST NOT BE USED IN A PROHIBITED MANNER. SPECIFICALLY:

- it cannot be operated with parameters different to those shown in the “TECHNICAL CHARACTERISTICS” table or with products and/or materials with different characteristics to those previously described in the heading “TECHNICAL CHARACTERISTICS”.
- all uses of the machine other than those described in this manual are construed as improper and as such the manufacturer declines all liability.
- the user is responsible for any damage resulting from failure to observe the operating conditions agreed at the time of technical specification and order confirmation.

FORBIDDEN USE

DANGER - WARNING
FURTHERMORE IT IS PROHIBITED TO USE THE MACHINE IN AN INCORRECT MANNER, IN PARTICULAR:

- never leave the loaded machine unattended,
- never use flammable, corrosive or toxic substances to clean the machine,
- never allow unauthorized personnel to use the machine,
- never smoke or use open flame equipment or handle incandescent material, unless adequate safety measures have been adopted,
- never activate or adjust the control and locking devices, such as knobs or similar devices, during machine operation or when not authorized to do so,
- never hang objects or weights on the machine,
- never use the machine with the safety guards open, incorrectly fastened, or removed,
- never use the machine with the safety microswitches and interlocking safety devices inhibited and, in general, with any safety and/or protective device (mechanical) deactivated and/or non-functional,
- never partially or totally by-pass, remove, modify or in any way render ineffective the guards, safety microswitches and warning signs,
- use of the machine is forbidden when the user has not adopted all the necessary measures to eliminate the residual risks as indicated in this instruction manual,
- never use the machine for operations other than those explicitly indicated in this instruction manual,
- never use the machine in environments for which it has not been designed unless all necessary safety measures have been adopted beforehand,
- the machine must not be used by untrained personnel,
- foodstuffs must not be brought into contact with the machine,
- it is prohibited to activate the control devices for machine movements without first checking and ascertaining the absence of persons in the danger areas subject to machine movements,
- it is prohibited to enter the operating / danger zone of the machine during control of the machine's moving parts,
- it is prohibited to enter the machine's operating zone with any part of the body, including hands and arms, before all hazardous moving parts have come to a complete standstill.
- it is prohibited for the machine operator and maintenance technician to enter the danger zones to perform cleaning, lubrication, maintenance operations etc. without having first set the power cut-off switches to "ZERO" and padlocked them in this position,
- the machine must not be used in critical conditions of stability, i.e.:
  - when placed on a support surface which is not perfectly horizontal and smooth, or does not have an inadequate load capacity as indicated in this manual,
  - outdoors or worksites with open windows and doors,
- the following are strictly prohibited:
  - processing of materials and products that are not expressly indicated in the present manual,
  - processing of metal materials made of aluminium, lightweight alloys, and steel and its alloys.

DANGER – CAUTION
The manufacturer cannot be held liable for any faults caused by unreasonable, improper and/or incorrect use of the machine.

The user is anyway responsible for all damage deriving from failure to comply with the specified terms of use. For any further information always consult the manufacturer's engineering department.
The user is always responsible for providing suitable personal protective equipment to machine operators and for informing them on the permissible uses of the machine.

PERSONNEL AUTHORIZED TO USE THE MACHINE

This machine has been designed and manufactured to be used by qualified personnel with adequate training, experience and skills. Below you will find a list of basic requirements:

Operators / Apprentices:

- may be male or female,
- must be aged 14 or over,
- must have full use of both hands,
- must have no physical or mental disabilities,
- must know and fully understand the contents of the user manual.

PERMITTED AMBIENT CONDITIONS AND OPERATING LIMITS

DANGER - WARNING
THIS MACHINE IS NOT SUITABLE FOR USE IN POTENTIALLY EXPLOSIVE ENVIRONMENTS.
THEREFORE IT IS PROHIBITED TO INSTALL OR USE IT IN ANY SUCH ENVIRONMENT.

SERVICE CONDITIONS

SERVICE CONDITIONS	SERVICE CONDITION USER LIMITS
Installation type	Indoor
Floor conditions 2%	Horizontal and smooth: irregularity and gradient tolerance within
Supporting surface characteristics workplace in accordance with all applicable legislation	Flooring in compliance with health and safety requirements in the
Maximum ambient air temperature	+40°C
Minimum ambient air temperature	5°C (with electrical equipment protection rating of at least IP54)
	0°C (with electrical equipment protection rating lower than IP54)
Ambient working temperature	+5 °C < T < +45° C
Transport and storage temperature admissible for periods of less than 24 h)	between -25°C and +55°C (temperatures of up to +70°C are
Maximum altitude above sea level	1000m
Minimum required light intensity	600 lux
Relative humidity of 100% at +25°C (electrical equipment protection rating of at least IP54)	
Relative humidity shall not exceed 50% at +40°C or 90% at +20°C (electrical equipment protection rating below IP54)	
Equipment for machine designed for indoor installations	
Machine NOT suitable for operation in contaminated atmospheres: for example, dusts, acids, corrosive gases, salt or similar contaminants.	
Machine **NOT suitable** for operating in potentially explosive atmospheres classified as zone 0, zone 1, or zone 2.	
Machine **NOT suitable** for operation in environments subject to the presence of ionizing and non-ionizing radiation: for example, microwaves, UV rays, laser, X-rays, and similar.	
Electrical equipment NOT suitable for installation on machines or for operation in places subject to vibration and impact: otherwise, install equipment well clear of source of vibration and impact and fit antivibration supports.	
Pollution class of electrical equipment equivalent to 3 (THREE)	
Installation environment equivalent to two (2)	
Can be utilised in residential, commercial, of light industrial zones thanks to compliance with standard EN 61000-6-1	
Intended for direct/exclusive service of industrial process machinery	

SERVICE CONDITIONS	SERVICE CONDITION USER LIMITS
Special and additional prescriptions, not currently envisaged, may apply to machine designed for:	• use outdoors; • treatment of potentially explosive material; • use in potentially explosive and/or inflammable atmospheres; • use with specific risks in the processing of certain materials; • use in mines; • use in refrigeration plants; • use in high ambient temperatures; • use in corrosive atmospheres; • use in strong magnetic fields; • use in the presence of radioactive radiation; • use for loads that may lead to a situation of risk (for example, molten metal, acids/alkalis, fragile loads, explosive loads); • use on ships and when subject to earthquakes; • use in contact with foodstuffs; • use in public areas; • use for ground support for aviation.

1.4. TECHNICAL FEATURES

Machine features

Machine length.....590 mm
Machine width.....400 mm
Machine height.....500 mm
Maximum / minimum height of the working bench on the support stand.....860 / 1025 mm
Maximum machine tilt.....60 degrees
Machine weight.....50 kg
Support stand weight.....30 kg
Max. distance between V-nails with 90° fence.....200 mm
V-nail magazine capacity.....200 pieces
Max. quantity of V-nails inserted per position.....various, depending on the size of the moulding

Compressed air supply

Maximum permitted inlet pressure.....8bar
Operating pressure.....4-6 bar (no lower than 2.5bar, no higher than 7bar)
Specific air consumption.....3 Nl

V-nail characteristics

Height.....5 / 7 / 10 / 12 / 15 mm
Optional height.....3 mm

- V-nails for soft wood have a crown with a transparent edge and are kept in boxes marked “SW”.
- V-nails for medium/hard wood and MDF have a crown with a brown edge and are kept in boxes marked “HW”.
- V-nails for really hard wood and HDF have a crown with a red edge and are kept in boxes marked “RHW”.

1.5. PRODUCTS PROCESSED - HANDLED OR GENERATED

The products handled by the machine described herein must be made up of wooden mouldings of various hardness, with multiple surface finishes, for the purpose of making frames for pictures, mirrors, display cases, cupboard doors etc..

The main technical characteristics of the products handled by the machine described herein are provided below.

DESCRIPTION OF PRODUCTS HANDLED	CHARACTERISTICS
Minimum/maximum moulding width	6 / 140 mm
Maximum moulding thickness	80 mm
Maximum moulding length *	Without extensions: Max. length = 700 mm; Weight 10 kg. With extensions: Max. length = 1700 mm; Weight 25 kg.

1.6. EMISSION OF AIRBORNE NOISE

NOTE - The manufacturer declares, under his own responsibility, that the machine produces a continuous equivalent A-weighted sound pressure level of 72 dB.

DANGER – WARNING:
TO AVOID THE DANGER OF HEARING DAMAGE CAUSED BY SHRILL OR PERSISTENT NOISE, THE MACHINE OPERATOR AND MAINTENANCE TECHNICIAN MUST ALWAYS USE APPROPRIATE HEARING PROTECTION, SUCH AS HEARING DEFENDERS OR EARPLUGS.

1.7. RESIDUAL RISKS - GENERAL INFORMATION

This manual contains a list and description of the residual risks that could not be eliminated in the design stage and that therefore remain present on the machine.
For each risk, suitable instructions or prescriptions are given which the user must observe in order to avoid hazards affecting the machine operator, maintenance technicians, any exposed persons and the machine itself.

1.8. RESIDUAL RISKS

Residual risk due to noise

As demonstrated by experimental tests, the machine produces a continuous equivalent A-weighted sound pressure level of 72 dB.
To avoid the risk of hearing damage caused by shrill or persistent noise during machine use, in addition to being adequately informed and trained, the operator and maintenance technician must always use appropriate hearing protection, such as hearing defenders, earplugs or similar personal protection equipment to safeguard hearing.

PPE to be used:


Hearing protection

Residual risk due to the combustibility of the substances used in the machine and the products handled by the same

To avoid the hazards resulting from:
- the ignition of substances used in the machine,
- residual risks associated with possible outbreaks of fire,

the employer, in addition to training and adequately informing the machine operator and maintenance technician on such risks, must provide permanent fire protection systems in the vicinity of the machine control station. Said systems must be suitable for the types of material which could catch fire.

PPE to be used:


Protective gloves


Safety footwear


Protective clothing

Residual risk caused by piloting the valves with a special tool

There is a residual risk for the maintenance technician, when the safety guards are open and valve piloting is activated using the special tool, **in order to check (during troubleshooting procedures) the operation of the pneumatically operated mobile elements, when energy remains accumulated inside the actuator cylinders.**

Consequently, when the aforementioned activities are performed, the maintenance technician must make sure that no exposed persons are found near the pneumatically controlled mobile elements and in any case said mobile elements must only be activated if strictly necessary for pinpointing operating faults.

Residual risk due to the presence of accumulated energy inside the pneumatic actuator cylinders

There is a residual risk for the maintenance technician when the machine is isolated from the compressed air network, **due to the presence of accumulated energy inside the actuator cylinders**, when mobile guards are open, caused by the presence of closed-centre valves and/or tanks which remain pressurized.

Please note that said piping is duly identified and indicated to distinguish it from all other piping installed on the machine.

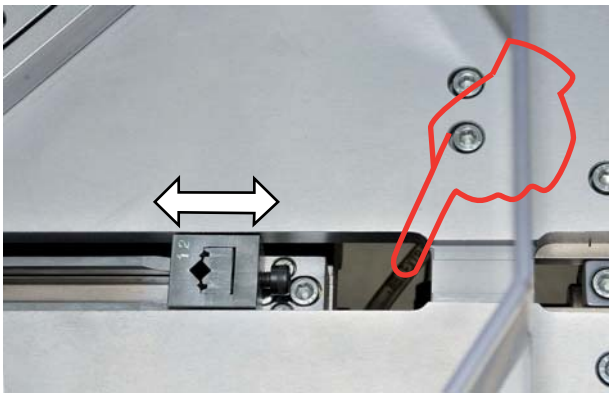
Consequently, before carrying out any work on the aforementioned cylinders, in accordance with the instructions given in the actuator manuals supplied with the machine, the maintenance technician must neutralise the accumulated energy working in compliance with the safety regulations applicable to maintenance personnel, such as, for example, manual activation of the special tool for the piloting valves used to discharge stored energy.
Under no circumstances must the piping be disconnected if they still hold residual pressure.

Residual risk of finger crushing

With the adjustable polycarbonate guard in the high or low position, there is a residual risk of finger crushing, for operators and maintenance technicians, inside the slot on the working bench along the stroke of the V-nail gun unit.

Furthermore, it is to be pointed out that said finger crushing risks are present near each mobile element installed over the machine's working bench.

Consequently the operator and maintenance technician, as well as observing the instructions provided in this manual, must never place their fingers or any other part of the body in the zone indicated.
What's more, workers must never wear rings, wrist watches, jewellery, torn clothing, scarves, ties or any other loose clothing or personal accessories that may constitute a risk. Make sure sleeves fit snugly around wrists and keep long hair tied back.



1.10. DESCRIPTION OF SAFETY FUNCTIONS

Protective devices installed on the machine

DANGER - WARNING
IT IS STRICTLY PROHIBITED TO REMOVE THE SAFEGUARDS AND SAFETY DEVICES EXCEPT WHEN STRICTLY NECESSARY FOR THE PURPOSE OF CARRYING OUT MAINTENANCE WORK.

When such safeguards and safety devices need to be removed all necessary measures must be adopted to highlight this situation immediately and minimise any possible associated hazards.
The safeguards and safety devices must be refitted as soon as the reasons for their temporary removal are no longer applicable.

Each operating unit of the machine is protected by a guard, which may also be a fixed guard designed to prevent access to dangerous parts, except:
- in the upper part of the working bench to perform adjustments, tooling, parts replacement, etc.
- in the lower part of the working bench to perform adjustments, tooling, parts replacement, etc.

Machine guards and safety devices

Ref.	SAFEGUARDS/ PROTECTION DEVICES - POSITION	TYPE OF HAZARD AVOIDED
A	Adjustable guard	Fixed polycarbonate panel with metal supports which can be adjusted by means of special knobs, to prevent access to the vertical clamp
B	Fixed guard	Front steel sheet metal panel secured in place by screws, to prevent access to pneumatic actuators inside the machine

With regard to fixed guards the following specifications apply:

- The dimensions of fixed guards are such as to eliminate all openings to the protected dangerous work zone when the guards are correctly secured in place.
- Fixed guards that are not permanently welded to the machine are secured in place by screws that call for the use of special tools (Allen keys) and can only be removed, using the appropriate tool, by authorized maintenance technicians.
- Access to areas protected by a fixed guard is allowed only for maintenance technicians. Irrespective of the circumstances, machine operators must never attempt to open a fixed guard.
- It is not possible to refit a guard incorrectly and leave potentially dangerous openings in the machine safeguards.
- If the guards are not fixed in their seats using the special screws, they will not remain lodged in their locations in the absence of the fastening elements.
  In sizing and selecting the guards and safety devices, the possibility of access by persons aged 14 or over was used as a reference condition.

DANGER - WARNING
ACCESS TO AREAS PROTECTED BY A MOVABLE GUARD IS ALLOWED FOR BOTH THE MACHINE OPERATOR AND MAINTENANCE TECHNICIAN. IRRESPECTIVE OF THE CIRCUMSTANCES, THE MACHINE OPERATOR MUST NEVER ATTEMPT TO VOLUNTARILY CIRCUMVENT A FIXED GUARD.

- Access to areas protected by a fixed guard is allowed only for maintenance technicians. Irrespective of the circumstances, the machine operator must never attempt to voluntarily circumvent a fixed guard.
- Before starting the machine, all guards and safety devices must be correctly installed, adjusted/tuned and made functional, adhering meticulously and carefully to the indications provided in the installation, use and maintenance manuals accompanying said safety devices (all of which are supplied with the machine) and this instruction manual.
- The manufacturer strictly prohibits any tampering, even partial or momentary, with any of the safety devices present on the machine, because they are installed specifically to ensure the physical safety of operators and other persons present in the machine operating area.
- Violation of this regulation will give rise to risks and is in conflict with statutory legal regulations concerning safety in the workplace.

1.11. MACHINE DESCRIPTION

THE FRAME ASSEMBLING MACHINE, Minigraf 144, is a machine for producing wooden frames. More specifically it joins together pre-glued or dry mouldings using metal V-nails.
All the work phases (such as: frame loading and unloading, clamping, head movement and V-nail firing) are performed manually.
The machine can use special Alfagraf V-nails with “Pulling Power” or standard V-nails.

In its basic configuration the machine is made up of a rigid steel structure, complete with base and a series of operating units and zones:

1 working bench, complete with:

- a double or single clamp device for immobilizing the mouldings,
- a system of fences,
- a V-nail magazine,
- a V-nail insertion system which uses a pneumatic actuator,
- a series of pneumatic actuators,

1 support stand (optional)

- a tray, complete with lid, for holding accessories,
- a series of adjustable feet for machine levelling.

The machine’s OPERATING FUNCTIONS are controlled manually by the operator who directly activates the pneumatic actuators.
The figure alongside shows the machine’s basic configuration, including manually activated lever with button, moulding clamp system, mobile fence and pedal.

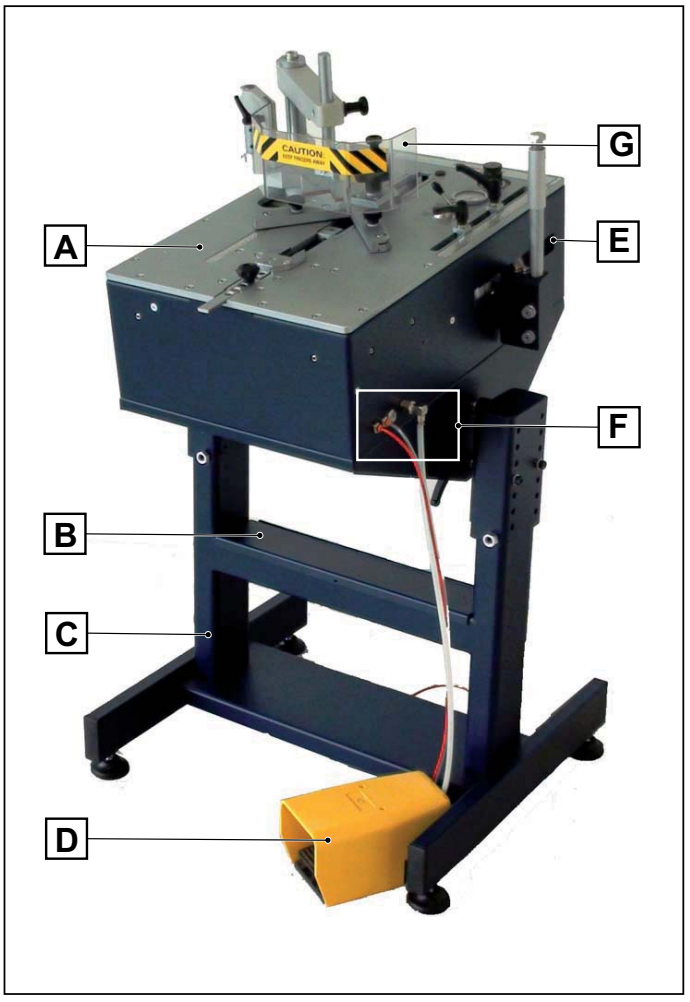
It can be placed on a solid and level bench or table top or on the special metal adjustable support stand (optional).

For the purpose of providing exhaustive information, the references and photos used in this manual refer to the machine installed on a support stand.

1.12. MAIN MACHINE COMPONENTS

In its basic configuration the machine is made up of a series of operating units and zones, including:

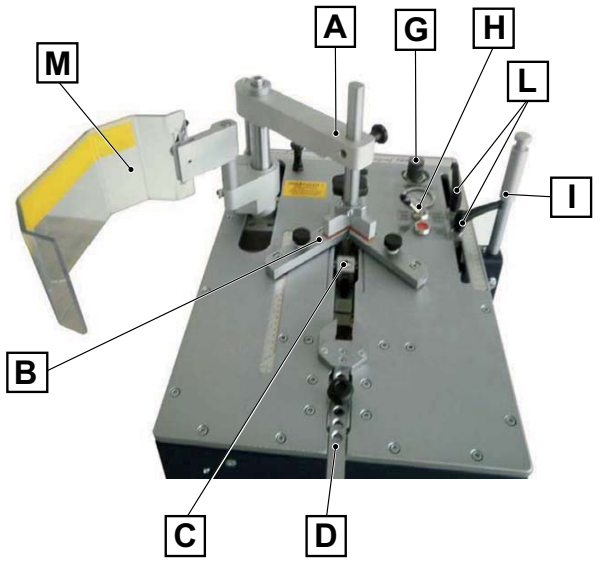
(A) Working bench
(B) Accessories compartment door
(C) Support stand
(D) Pneumatic pedal switch
(E) Machine casing
(F) External compressed air, pedal and power supply connections
(G) EC safeguard

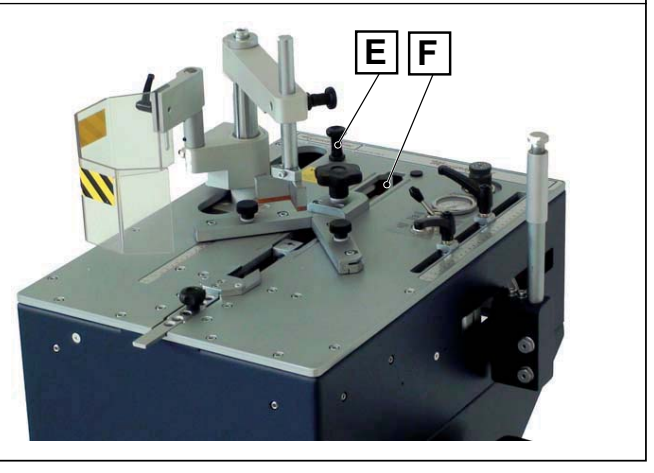


Working bench

The working bench is the surface on which manual operations to move, clamp and join the mouldings are performed. It incorporates all the operator controls.
It is made up of the following main parts:

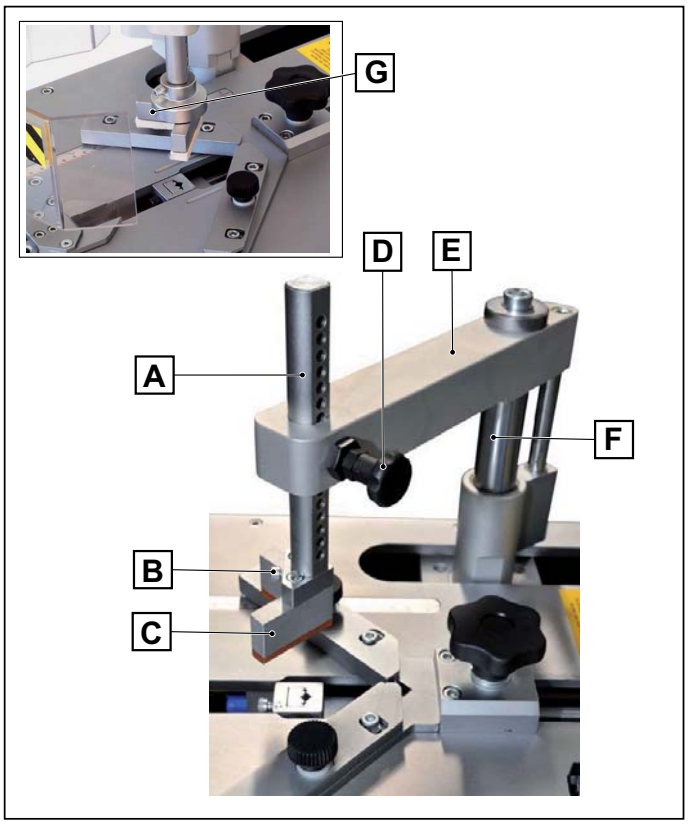
(A) Vertical clamp unit for immobilizing the mouldings
(B) Mobile and tilting fence unit with two knobs
(C) V-nail firing unit
(D) Front clamp unit for immobilizing the mouldings
(E) Head movement locking knob
(F) V-nail magazine
(G) Clamping units air pressure regulation
(H) Open magazine switch
(I) Handle for commands and head movement
(L) Head movement travel stop regulation unit
(M) EC safeguard





Vertical clamp unit

This unit is designed to block the mouldings on the working bench by creating an opposing force to V-nail firing.
Its position ensures that the pressure plate is aligned with the firing head and therefore on the same axis as the direction of V-nail insertion.
It is important that regulation of the air pressure applied to the vertical clamp determines a thrust which is always higher than the thrust exerted by the V-nails, it this is not the case, insertion of the v-nails may lift the mouldings up off the working bench surface, resulting in incomplete insertion of the V-nail and poor quality of the join.
The unit is made up of a mechanical rubber pressure plate or a magnetic support for felt or rubber pressure plates (C), located at the bottom of a punched rod (A), which can be positioned at various heights, depending on the measurements of the frame being handled.
The assembly is supported by an arm (E) which is activated vertically by a pneumatic actuator controlled by the operator.

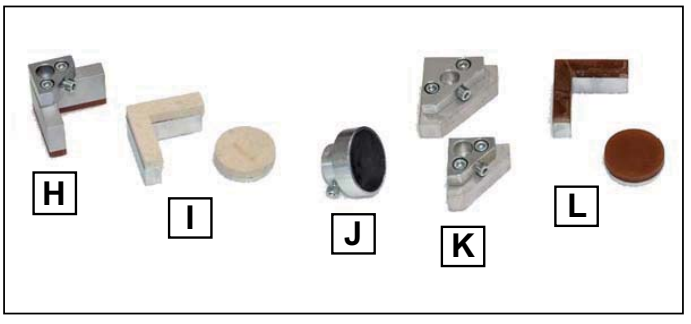


The vertical clamp unit is made up of the following main parts:

(A) Punched rod which allows the operator to position the pressure plate at various heights based on the various frame profiles.
(B) Screw for fixing and quickly changing the pressure plate.
(C) Mechanical rubber pressure plate (or of a different type, depending on the optional accessories used.)
(D) Spring-loaded rod locking knob
(E) Rod support arm
(F) Stem of the piston activated vertically by the pneumatic actuator
(G) Magnetic pressure plate holder.

Pressure plates available on request:

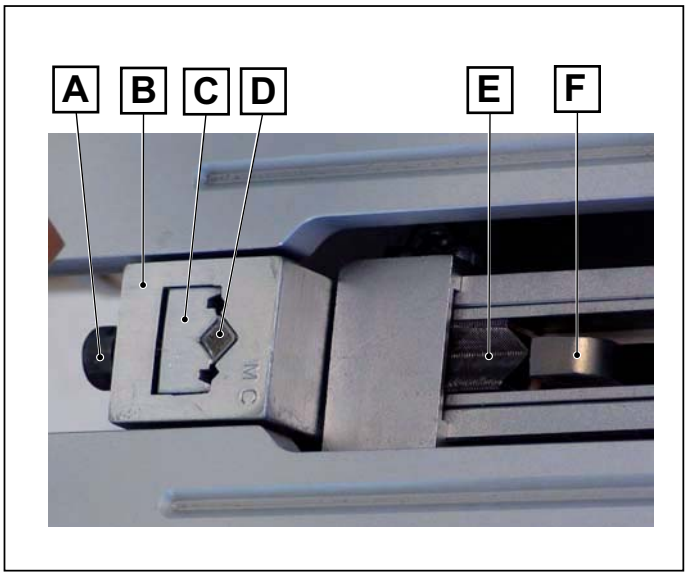
(H) Mechanical rubber, angular pressure plate
(I) Magnetic felt pressure plate, angular or round
(J) Magnetic pressure plate holder
(K) Flat pressure plate, large or small
(L) Magnetic rubber pressure pad, angular or round

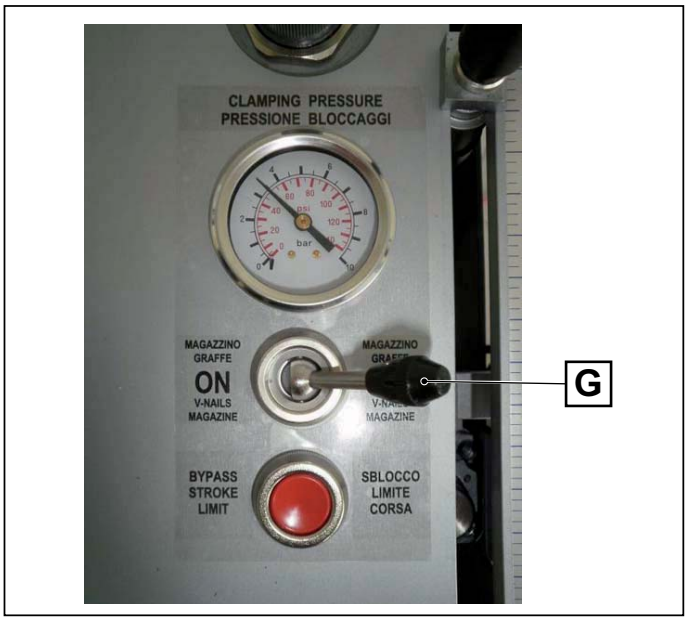


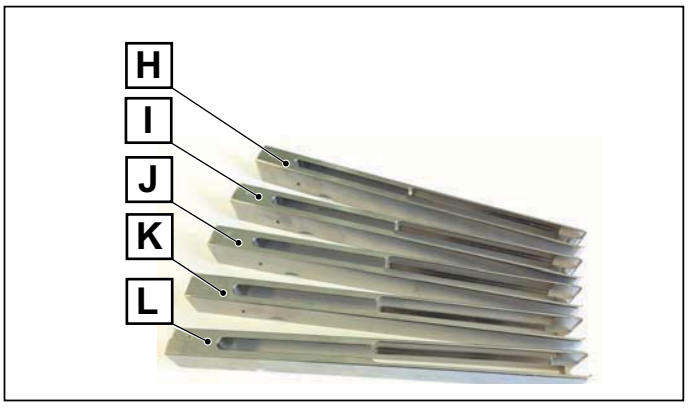
V-nail magazine and firing unit

The magazine can accommodate cartridges containing V-nails of five different heights, 5, 7, 12 and 15 mm.
To select the height of the V-nail to be used, simply pop in the relative cartridge, no tools required.
The V-nail firing unit is made up of an MC type head, suitable for V-nails of all heights, installed on an L-shaped support and a hammer which move inside the unit to fire the V-nails.
The head and hammer are designed to guide the V-nails during hammer thrust and their insertion into the overlying mouldings.
The magazine is pushed up against the L-shaped support and, thanks to a V-nail pusher device, it feeds and aligns the V-nails up against the guide every time the hammer is activated.
The hammer is activated by a pneumatic cylinder by means of a manual command.
The perfect mechanical alignment of these parts means that single or multiple V-nails can be inserted accurately into the mouldings being joined together, in the numbers required with set spacing.

(A) Head fixing screw
(B) MC type head
(C) L-shaped support
(D) Hammer
(E) V-nail cartridge inserted in the magazine
(F) V-nail pusher, keeps the V-nails pushed up against the firing unit at a constant pressure
(G) PLV selector lever
in the OFF position (open) it draws the V-nail pusher back so V-nails can be loaded into the cartridge or the cartridge switched.
In the ON position (closed) the V-nail pusher goes back to pushing the V-nails up against the firing unit. When in the OFF position, all clamping and firing commands are disenabled and the pedal does not work.
(H) Cartridge for 5 mm V-nails.
(I) Cartridge for 7 mm V-nails.
(J) Cartridge for 10 mm V-nails.
(K) Cartridge for 12 mm V-nails.
(L) Cartridge for 15 mm V-nails.



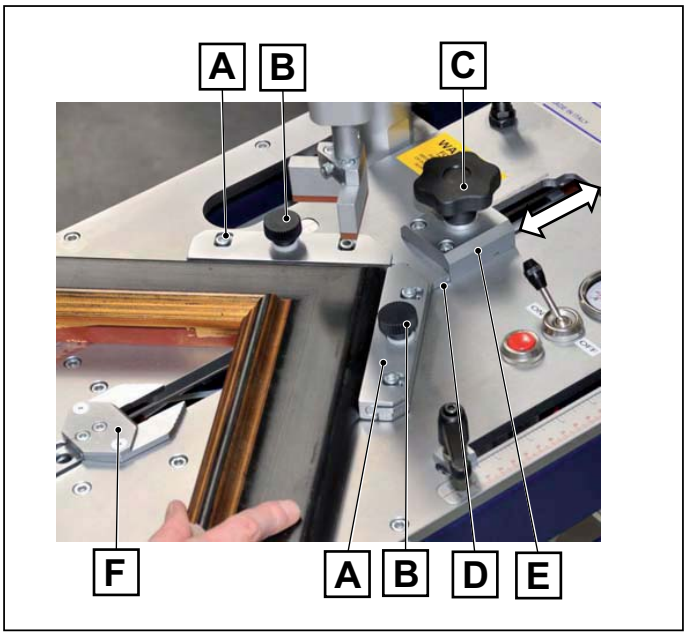




Adjustable tilting fence unit

The fence unit, positioned on the working bench, can slide along the assembly line of the V-nail firing unit. Its position is adjusted by the operator based on the dimensions of the mouldings in relation to the position of the front clamp.
The knob (C) locks the fence unit on the working bench by the force of clamp (E).
Once locked in place, the fence unit forms a stable guide up against which the mouldings can be pushed to create the corner to be joined.
The two mobile parts (A), installed only on the fixed 90° fence (D), are fitted with a knob (B) so that that they can be tilted in relation to the working bench and adapt better to the profile of the frame mouldings.
The fixed fence for 120° and 135° corners can also be installed in clamp (E) to make frames with 6 and 8 sides respectively (available as optional accessories). These two additional fence units do not have any mobile parts (A).
The 90° tilting fence unit, for four-sided frames, installed on the standard machine, is made up of the following main components:

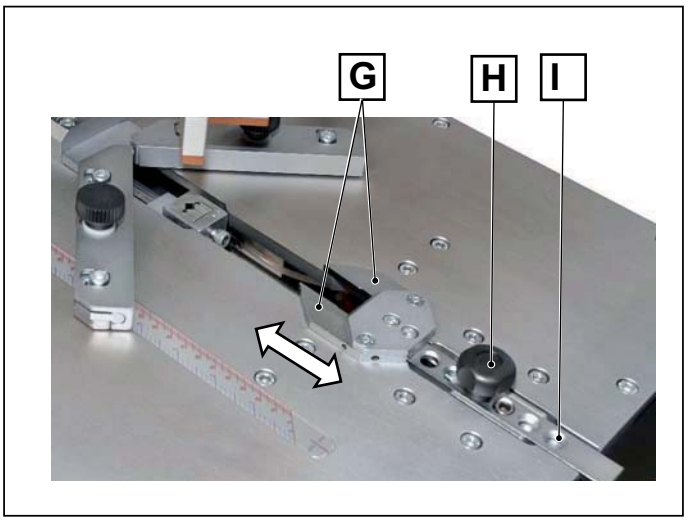
(A) Adjustable tilting guides
(B) Knob for tilt adjustment
(C) Knob for locking the fence unit
(D) Interchangeable 90° fixed fence unit
(E) Locking clamp
(F) Front locking clamp



Front locking: rod clamp

The rod clamp is fitted with two mobile jaws (F) which move forward up against the internal corner of the mouldings when the operator presses the pedal. This ensures that the mouldings are securely locked against the fence unit.
The front clamp is moved by a pneumatic actuator and, as long as the pedal is pressed, it holds the mouldings still throughout the V-nailing process, even then the vertical clamp is released to allow the operator to move the firing unit and insert V-nails in the various positions along the join line.
Usually the position of the front clamp is kept the same, whatever the size of the mouldings being joined, with the necessary adjustments being made only on the fence unit.
The front locking clamp is made up of:

(G) Mobile jaws
(H) Knob for securing the rod to the front clamp's pneumatic actuator.
(I) Holes for anchoring the rod to the pneumatic actuator slide.



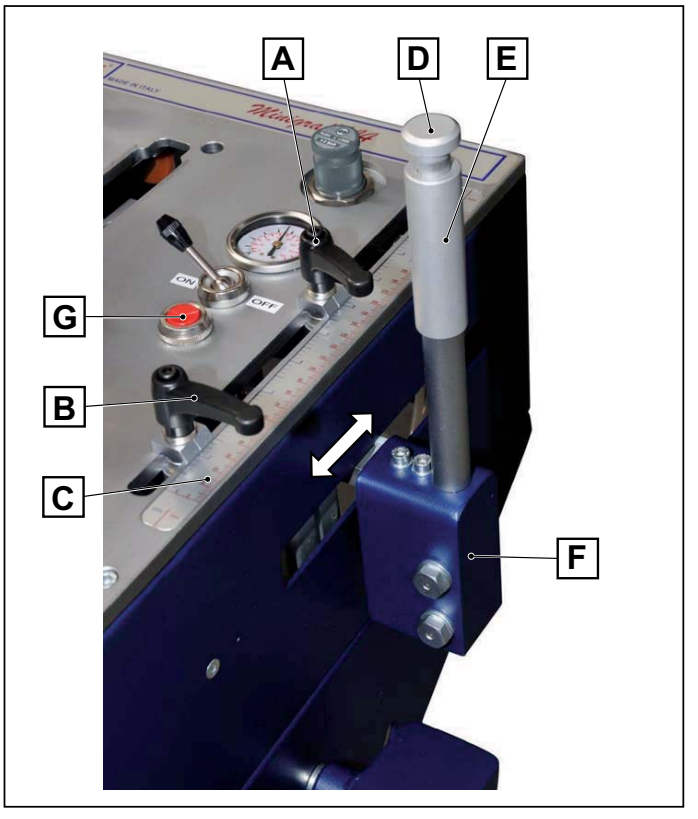
Head movement handle

This device allows the operator to move the carriage which supports the V-nail firing unit to the point where V-nails are to be inserted.
The functions controlled by the handle are enabled only when the pedal switch is pressed.
The handle (E) is fitted with a button (D) which activates a dual-command pneumatic valve:

- press lightly (half-stroke) to activate vertical locking and activate the AFC brake,
- press down completely to insert V-nails,
- release the button completely to lift the vertical locking clamp and move the handle to move the V-nail firing unit to a new position.

The ends of the carriage stroke are limited by the position of the two locking handles (A and B) along the double graduated scale (metric and imperial) (C).
Pressing the red button (G) allows the operator to move the handle beyond the upper travel stop (A). This is necessary to perform V-nail cartridge changeover and magazine cleaning operations.
The machine is designed to operate with the handle positioned on either the right- or left-hand side. Just a few simple operations are needed to remove it from the support (F) and install it on the opposite side. For further details, please read the heading ADJUSTMENTS.

(A) Upper travel stop locking handle.
(B) Lower travel stop locking handle.
(C) Graduated scale (metric and imperial)
(D) Dual-command button
(E) Handle for moving the V-nail firing unit
(F) Handle support
(G) Button which allows the carriage to go beyond the upper travel stop.



Working bench arm extensions (optional)

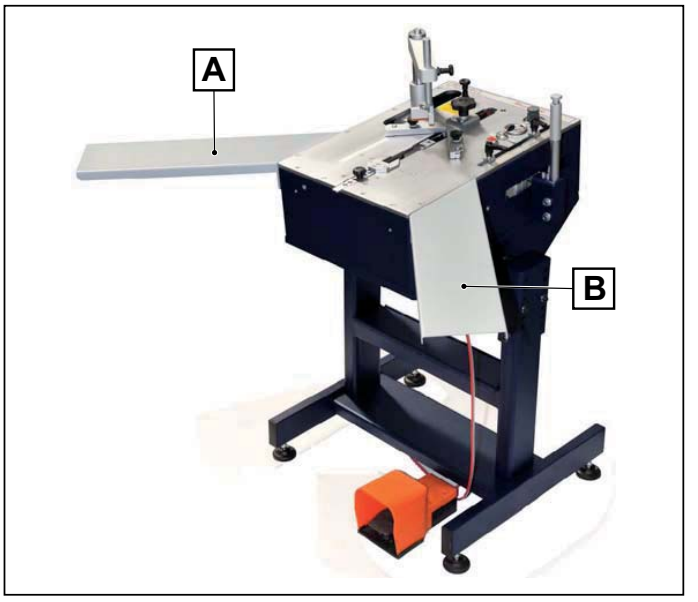
For joining mouldings exceeding 700 mm in length the work surface needs to be increased by installing the two arm extensions (A and B) (optional).
The arm extensions need to be fitted to the sides of the machine. They must be perfectly aligned with the work surface, see heading ASSEMBLY OF UNITS SHIPPED SEPARATELY.

(A) Right arm extension
(B) Left arm extension

The machine is designed to be STATIC, i.e. it must be positioned or anchored to the floor or other part of the building structure so that it remains stationary during operation.

The machine is LOADED AND UNLOADED MANUALLY:

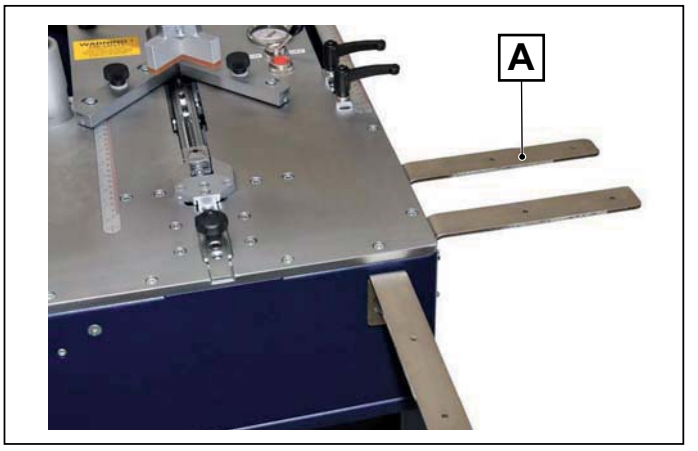
i. MANUAL POSITIONING OF THE MOULDINGS to be assembled on the working bench, with the fixed guards closed and locked
ii. MANUAL REMOVAL OF THE ASSEMBLED MOULDINGS from the working bench, with the fixed guards closed and locked.



Working bench extension brackets (optional)

To extend the mouldings support surface, it is possible to install 6 brackets (A) (2 on each side) onto which a work surface made from wood or similar material (not provided) can be affixed.
For information on how to install the brackets, pleaser refer to the heading ASSEMBLY OF UNITS SHIPPED SEPARATELY.

(A) 90° bracket with slot and holes for attachment to the machine and additional work surface.



2. INSTALLATION

2.1. STORAGE

The machine, intended for indoor installation must be stored, if necessary, in well ventilated storage facilities and protected from dust. The delivered elements must remain in their original packing until the time of final installation.
All parts of the machine subject to the risk of oxidation are protected with grease and protective sprays at the time of dispatch to prevent oxidation caused by weather conditions.

In the case of prolonged inactivity the machine must be stored with all necessary precautions taken based on the location and expected storage times:
1. Store the machine in an enclosed place.
2. Protect the machine from impact and stress.
3. Protect the machine from humidity and excessive temperature differences (refer to the table below).
4. Do not allow corrosive substances to come into contact with the machine.
5. Check that the pack has not been damaged and that it is perfectly dry.
6. In particular, if the machine is inside a shipping container, the storage area must be covered and protected against the elements, such as rain, snow and hail. It must be accessible to authorized personnel only.

The machine is protected in such a way as to withstand the temperatures, humidity and vibration levels typically associated with transport and storage.

Ambient temperature	-25 / +40 °C	Do not store in places subject to sudden temperature changes that may cause condensation or freezing
Storage temperature	-25 / +55 °C 0 / +55 °C	
Relative humidity	100% at temperature of +25°C less than 50% at temperature of +40°C less than 90% at temperature of +20°C	
Vibrations	5.9 m/s2 (0.6G) or higher	
Atmospheric pressure	900 mbar or higher	

Storage temperature is construed as a short-term value, e.g. during transportation. Condensation or freezing normally occurs in sites subject to significant temperature excursions. Even if relative humidity in such conditions falls within the values shown in the table, locations subject to significant temperature changes should be avoided.

2.2. CHECKS ON RECEPTION

NOTES
It is essential to check the packs at the time of arrival and in the precise moment in which they are received. The check is performed in two stages for each pack received to avoid misunderstandings with the shipping agent.

Administrative check
1. Crate number and number of packs.
2. Weight and size
3. Correspondence of information on shipping document with the material effectively delivered (description, serial number, etc.. The technical data given on the machine identification plate must correspond with the date given in the technical data supplied).
4. Check correspondence between shipping document data and the order.

Technical check
1. Condition and intactness of packaging.
2. Check that the packaging shows no signs of visible damage caused during transport and handling operations.

All the above checks must be performed by inspection in the presence of the shipping agent's delivery person. If any damage is noted or the supply is incomplete or incorrect, inform the manufacturer's sales department immediately.

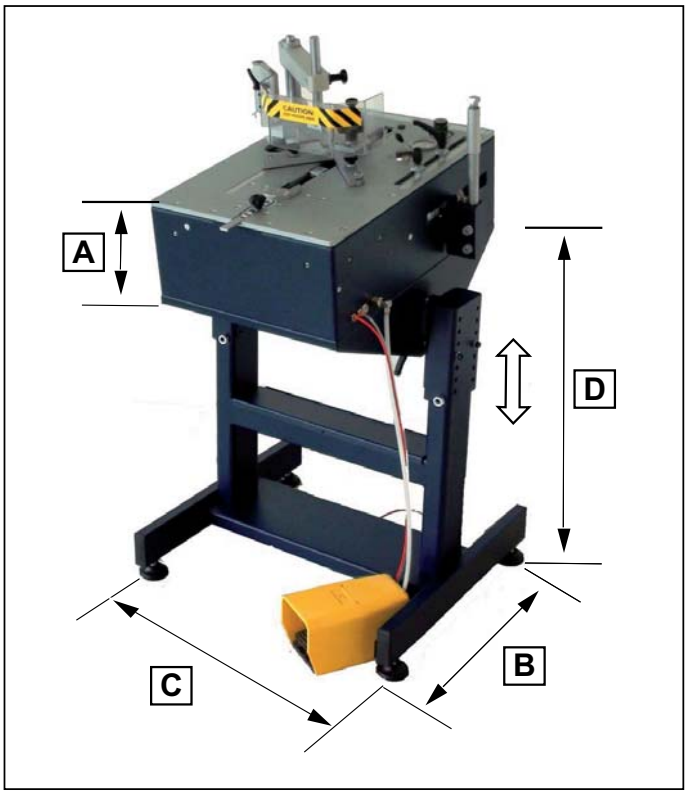
NOTES
In relation to the above prescriptions, the manufacturer informs the user that in compliance with current international and national rulings, goods are always shipped at the risk and responsibility of the purchaser and, unless otherwise stated in writing at the time of the order confirmation, freight travels without insurance cover.

2.3. TRANSPORT, LIFTING AND HANDLING

Dimensions, weight and handling of individual machine parts

MACHINE BODY

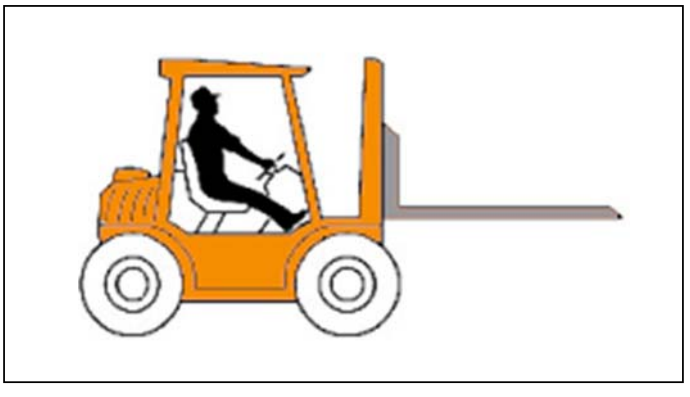
Height ..... A = 190 mm
Depth ..... B= 600 mm
Width ..... C = 640 mm
Max./min. adjustable height of the support stand .....
..... D = 670/835 mm
Machine weight ..... 50 kg
Support stand weight ..... 30 kg



2.4. LIFTING AND HANDLING

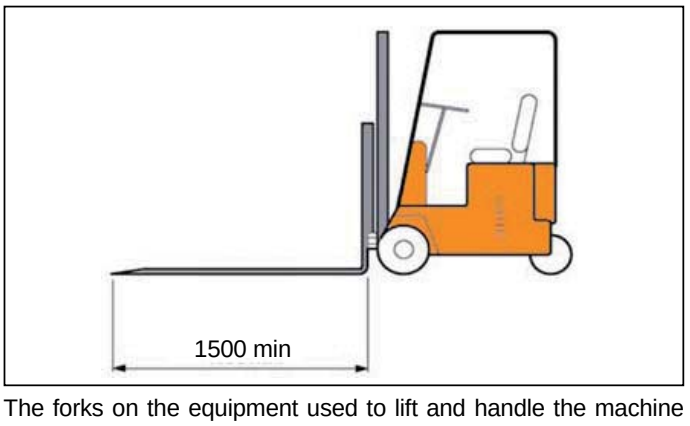
DANGER – CAUTION

- **The machine must be transported to a position as close to the intended installation site as possible. Said site must be checked beforehand to obtain information about the necessary clearances and dimensions, including the essential space required for installation procedures.**
- **It is strictly prohibited to lift loads over people. If persons are present in the area, lower the load and ensure everyone moves out of the way.**

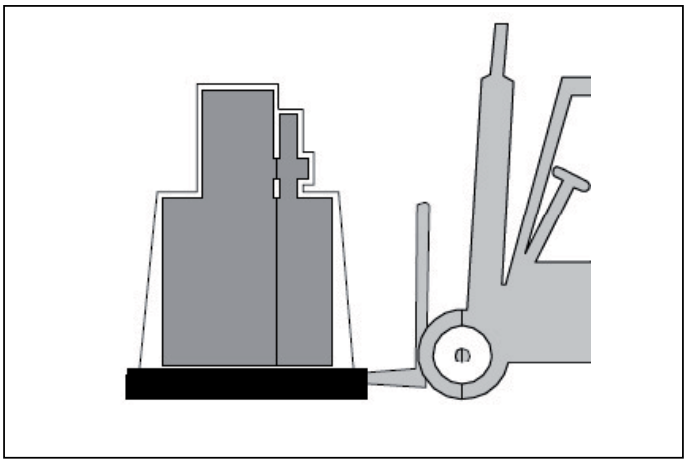


Lifting FROM BELOW

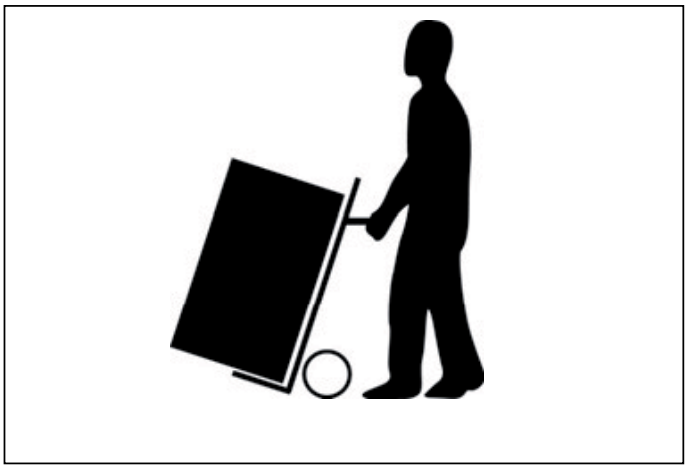
The operations to lift and handle the machine must be carried out using either a forklift truck or a pallet jack, making sure that the forks of the chosen equipment are inserted correctly under the packaging or machine structure. Make sure the load is evenly balanced.



The forks on the equipment used to lift and handle the machine must be in good, undamaged condition and be at least 1500 mm long.



When the machine is packaged on a pallet it must be moved by a forklift.



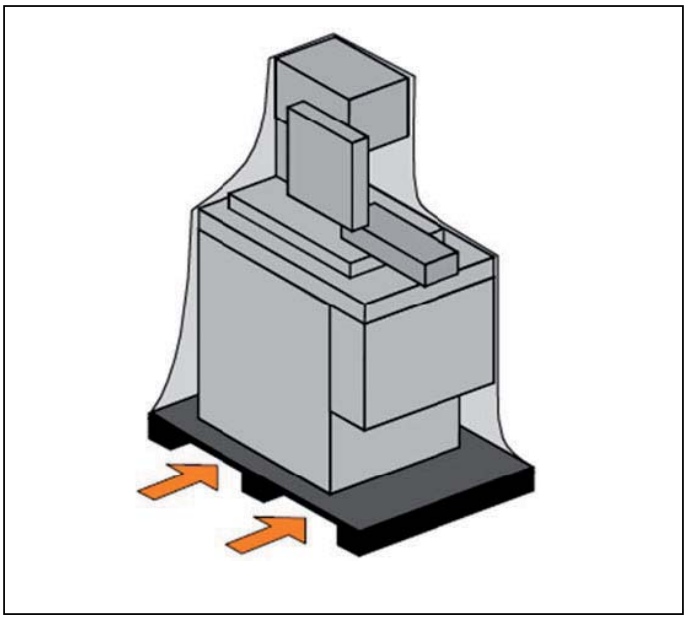
When the machine is unpacked it can be moved on a two-wheel carriage.

2.5. REMOVING THE PACKAGING

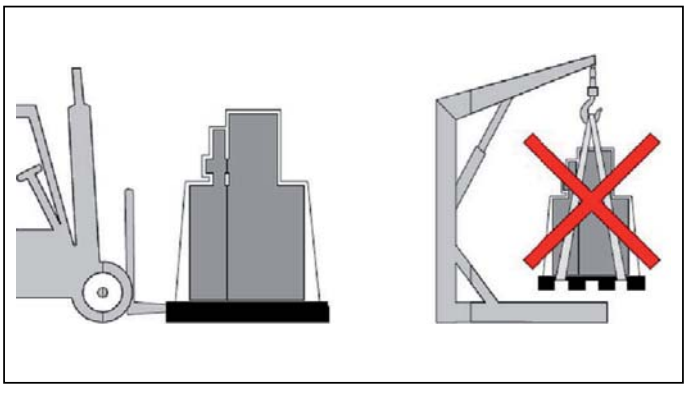
Description of the packaging

The machine may be shipped in a container or on a lorry.
In both cases the same type of packing is envisaged which is suitable for guaranteeing the good condition and proper preservation of the machine during transport up to the time of delivery to the customer.

For correct balancing of the weight, pick up the machine using forklift equipment, inserting the forks in the points indicated by the arrows in the figure. Before proceeding to move the machine, make sure that the weight of the machine indicated on the packaging falls within the maximum hoisting capacity of the chosen lifting equipment.

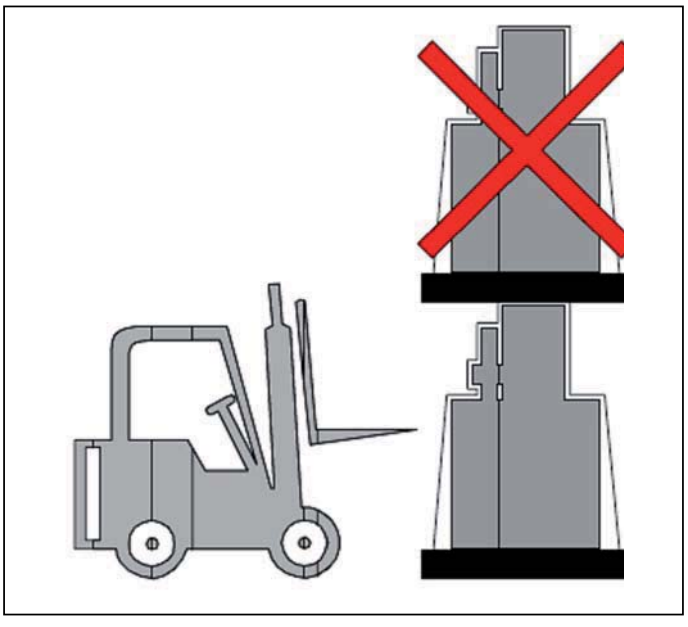


DANGER – CAUTION
Do not rig the machine up with belts for handling operations.



When storing the machine, never stack two machines packed on a pallet with shrink wrap.

The various packing materials must be disposed of in compliance with the relative legislation in force. Seek advice from the delegated authorities and/or the assistance of specialist companies authorised to dispose of pollutant or recyclable waste products.



DANGER – CAUTION
Warning – pollution hazard: Do not dispose of the packing material in the environment; retain it for future transport uses or consign it to a recycling company.
Evaluation and management of the packing materials in terms of biological compatibility are the duty and responsibility of the user.

3. PRELIMINARY PREPARATION AND ADJUSTMENT PROCEDURES

3.1. POSITIONING

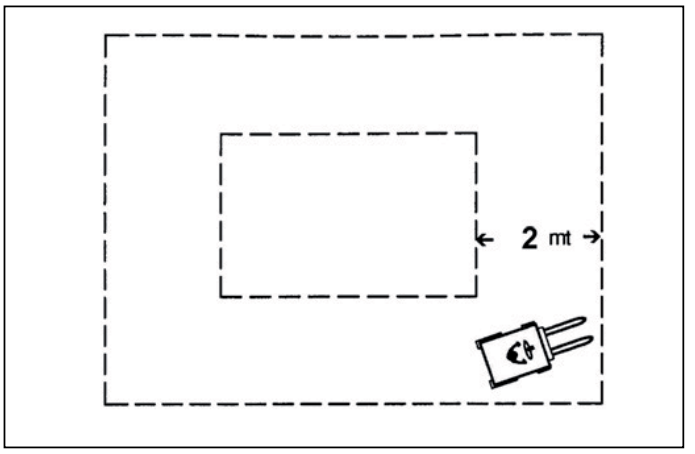
Suitability of the floor – supporting surface

The machine must be positioned on a solid reinforced concrete foundation.
The foundations must have an adequate load bearing capacity to support the weight of the machine. The foundations must be designed and created by the employer.

Preparation on site

The machine layout is provided as an attachment to this manual. It is complete with the necessary data for positioning on the factory floor.
THE PLACE IN WHICH THE MACHINE IS USED must be clean and free of obstacles (see figure).

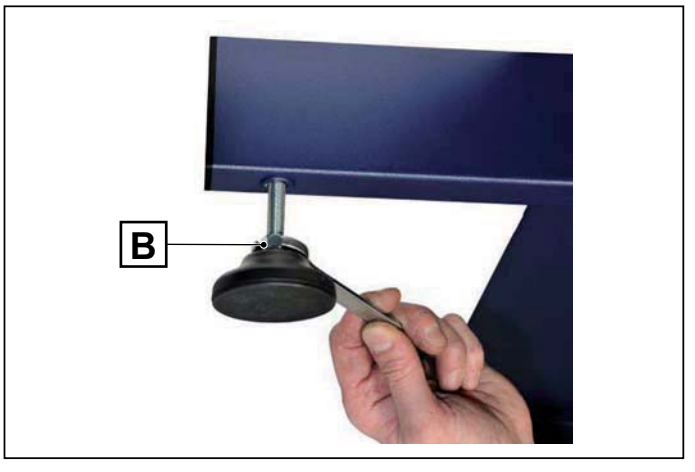
TO ALLOW FOR EASY REMOVAL OF THE MACHINE FOR MAINTENANCE it must be positioned in a place having the surface dimensions indicated in the figure.

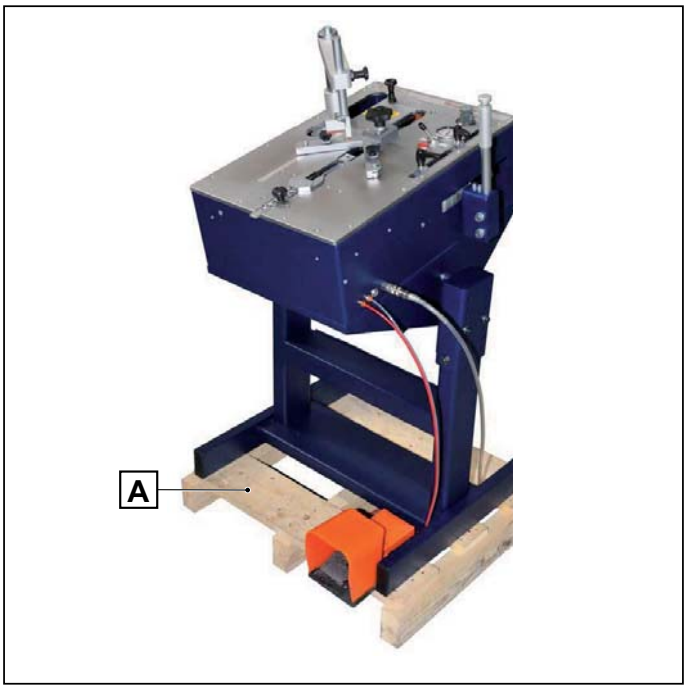


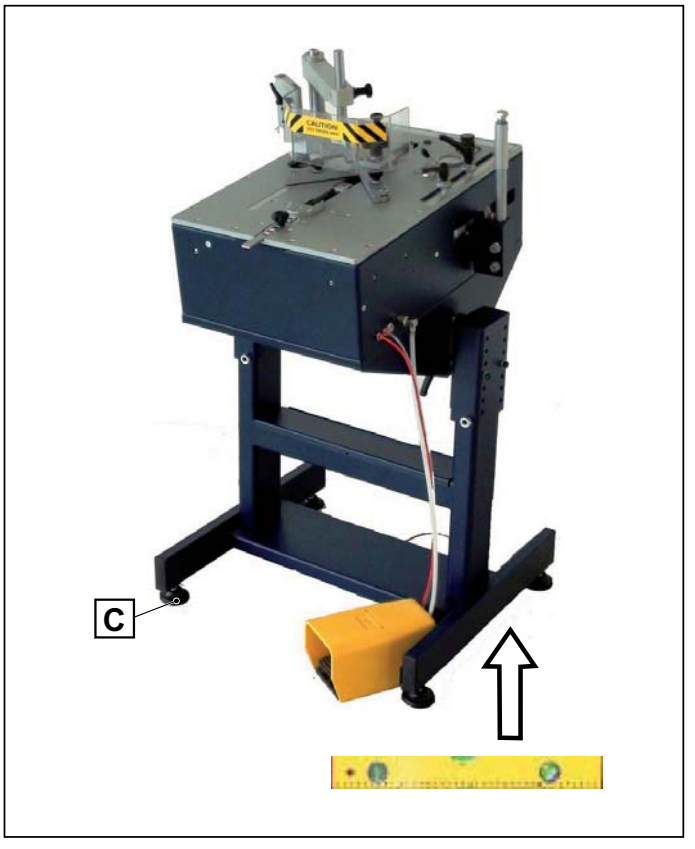
3.2. MACHINE LEVELLING

Stability of the machine is designed in such a way that, in the specified operating conditions, it can be used without any risk of overturning, falling, or uncontrolled displacement.
In order to avoid mechanical stress during normal use of the machine and undue strain to the structure, the machine must be stabilised during lifting operations.

The standard machine is designed to be placed on a table or bench top. If the machine is supplied with a support stand (optional) fastened on a pallet (A), remove the 4 screws securing the support stand to the pallet and take it off. Install the 4 support feet (B) using a suitable wrench. It is important to stabilize the support stand by turning the threaded pin on each foot (C).







3.3. ASSEMBLY OF UNITS SHIPPED SEPARATELY

DANGER – CAUTION

All assembly activities concerning machine units supplied separately, include highly delicate operations which call for significant experience. Consequently they must be carried out exclusively by personnel appointed directly by the manufacturer or authorised by the same and, in any case, under the manufacturer's responsibility. These activities are therefore the sole responsibility of the machine manufacture's personnel.

Installation of working bench arm extensions (optional)

The working bench arm extensions are optional and may be requested from the manufacturer.
Their installation requires precise alignment between the work surface and the extensions so that the lower surface of the mouldings rest fully on the entire support surface when the double clamp presses down on the moulding ends.

To install the arm extensions proceed as follows:
1. Unscrew the grub screws located on the left- and right-hand sides of the machine.
2. Place the right and left extensions alongside the machine accordingly.
3. Insert the fixing screws and align the extensions. Finally, tighten the screws.

1

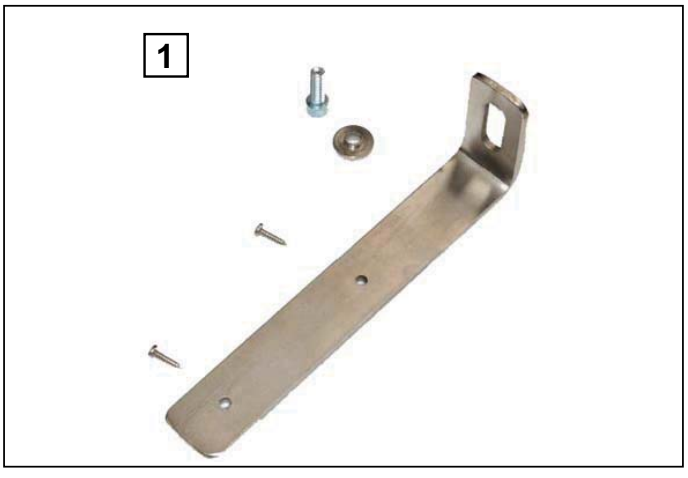
2

3

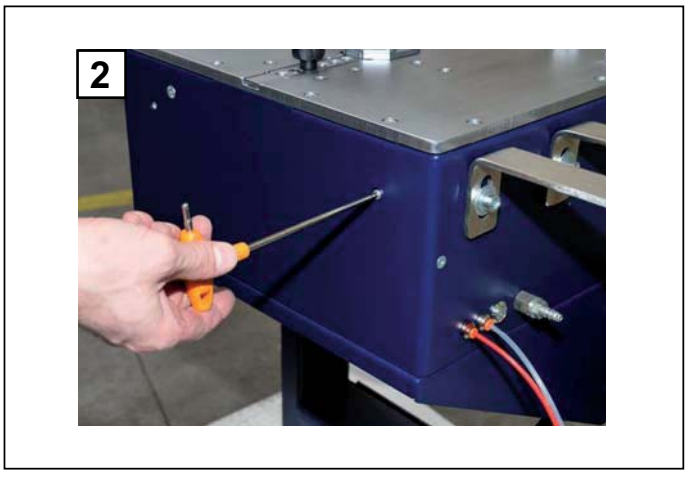
Installation of the extension brackets to support a wooden work surface

The wooden work surface (not supplied) and the working bench surface must be aligned with great care, so that the lower surface of the mouldings rest fully on the entire support surface when the double clamp presses down on the moulding ends.
To facilitate the operation, each bracket has slots for adjusting the height of the work surface.

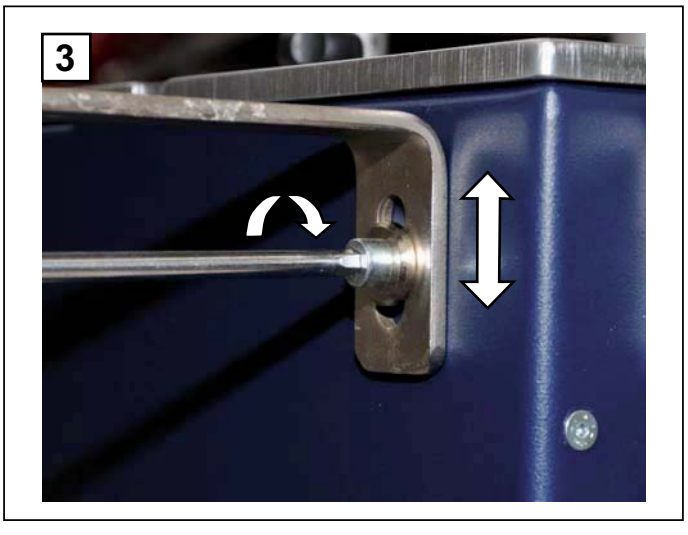
To install the brackets, proceed as follows:



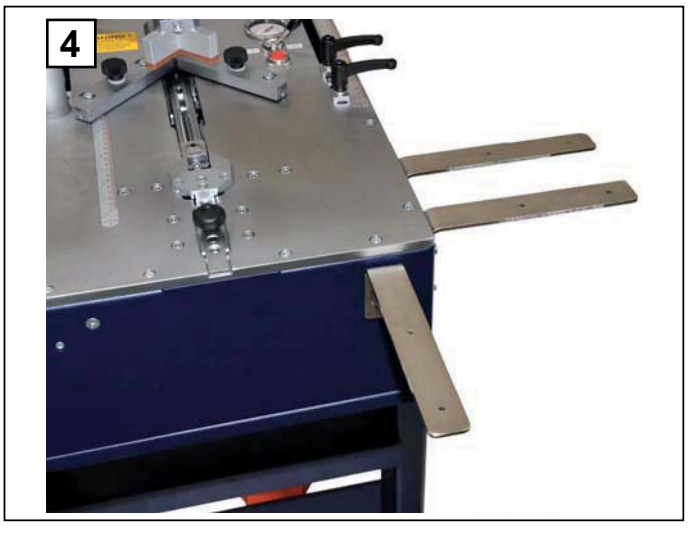
1. Check that each of the 6 brackets comes complete with the items shown in the photo.



2. Remove the grub screws from the machine casing.



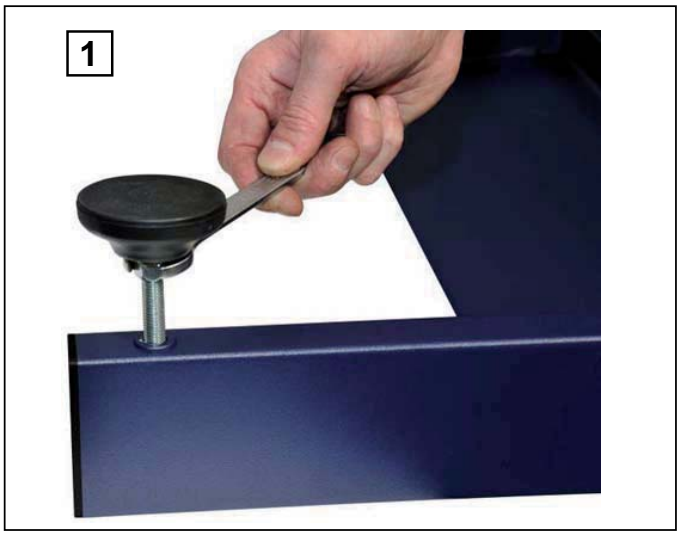
3. Put the washer with spacer and the Allen screw into the slot on the bracket. Do not tighten completely until the work surface has been put on top so that the height can be adjusted as required.



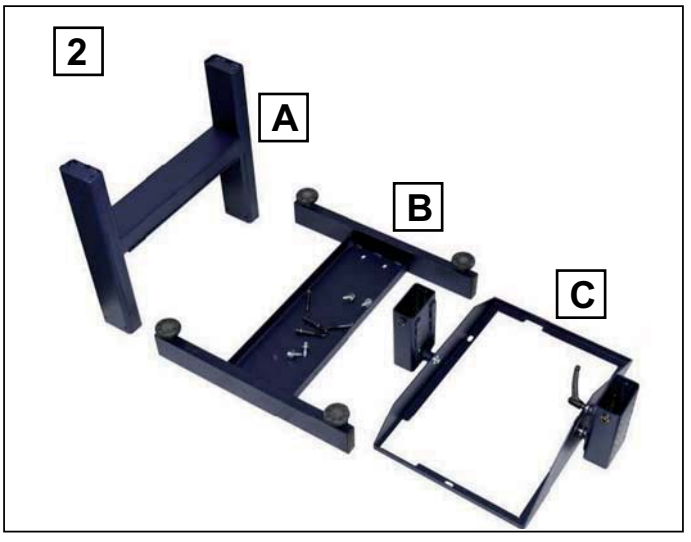
4. After installing all 6 brackets, put the wooden word surface on top and adjust the height of each bracket as required.

Support stand assembly (optional)

The machine support stand can be ordered from the manufacturer.
To assemble, follow the simple steps described below:



1. Screw the support feet into the base of the stand.



2. Proceed with assembly by joining together the base (B), the uprights (A) and the cradle fitted with supports (C).

3. Join the base to the uprights using the 4 screws provided

4. Fit the cradle supports onto the uprights.

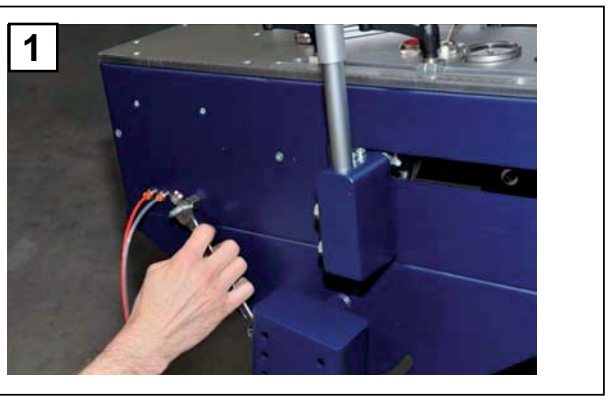
5. Adjust the height as required and then tighten the Allen screws.

6. Tighten the grub screws and lock nuts.

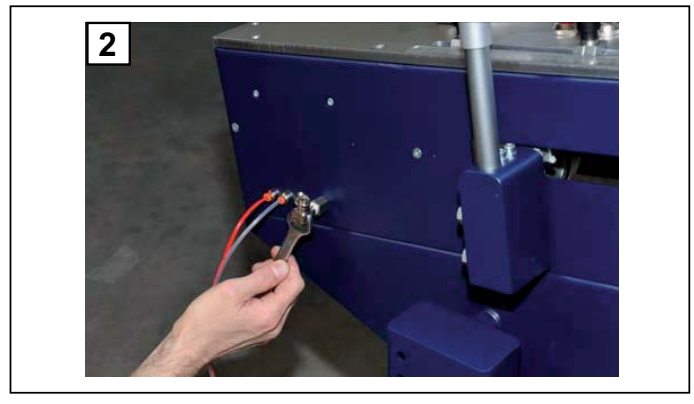
7. Position the machine on the cradle and insert the three Allen keys.

Support stand assembly (optional)

In compressed air supply inlet, the machine is fitted with a series of quick-fit connectors and is designed so that a filter unit with regulator can be installed (optional)
To install the filter unit, proceed as follows:



1. Remove the quick-fit connector.



2. Screw in the compressed air line connector.

3. Secure the unit in place with the 2 Allen screws.

4. Connect the filter to the machine with the compressed air line.

5. Screw the quick-fit connector into filter inlet.

6. Connect up the compressed air supply and adjust the pressure to at least 6 bar, checking the reading on the pressure gauge.

3.4.2. Compressed air supply

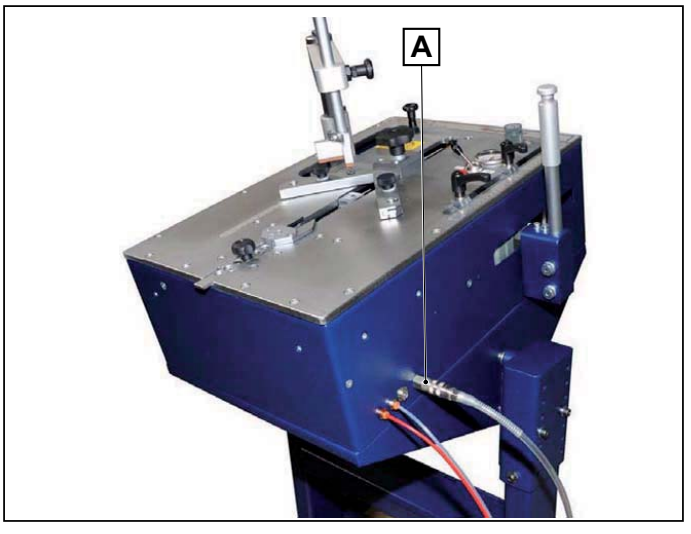
The compressed air supply must be maintained in compliance with the following technical prescriptions:

- The compressed air supply must be of the type and intensity specified on the first page of the “pneumatic diagram”. If excessive pressure values are applied the components will be irreparably damaged.
- The compressed air supply: taking into account the fact that the machine’s pneumatic system is construed as a component of the distribution network, in the context of protection against overpressure, a protection device must be installed coordinated with the machine’s pneumatic circuit, in compliance with legislation and the legislative and regulatory provisions in force in the country of installation.
- The pneumatic system compressed air supply lines must be routed through the spaces provided by the user and must be adequately protected.
- The compressed air supply line must have a section and characteristics corresponding to the specifications shown on the first page of the “pneumatic diagram”. Pipelines of different sections to those specified can alter pressure values and therefore impair correct operation of the machine.

The following units are incorporated in the compressed air inlet point:

Standard supply

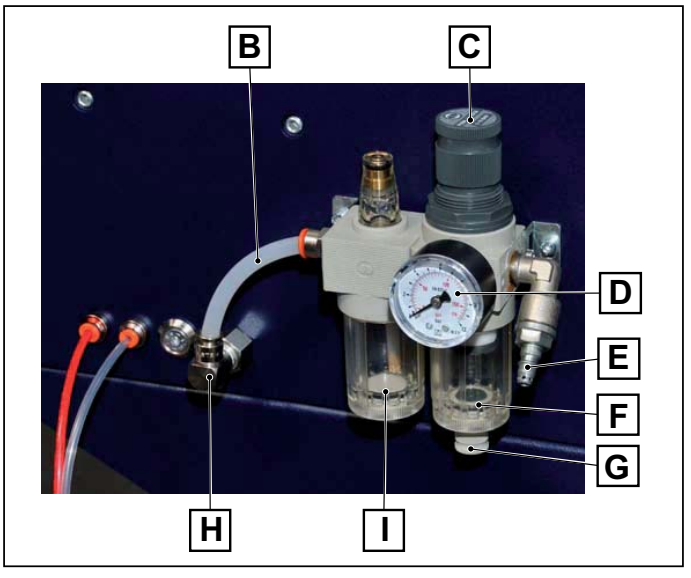
(A) Quick-fit connector



Optional supply

the filter regulator unit can be supplied on request.

(B) Rislan air inlet pipe
(C) Pressure regulation knob
(D) Supply pressure gauge
(E) Compressed air inlet connection point with quick-fit connector
(F) Condensate collection bowl
(G) Connection point for draining off condensate collected in the bowl
(H) Air inlet into machine connector
(I) Lubricant reservoir, to be half filled with oil



The figure alongside shows the components of the filter unit supplied as an optional extra.

1. Before hooking up the compressed air supply to the filter unit, check that the compressed air line is of the right section for the required flow rate.
2. Make the pneumatic hook-up to the inlet of the filter/pressure reducer/lubricator unit (E).
3. Once the compressed air supply line has been connected up to the relative connector, check the reading on pressure gauge (D) to ensure the pressure is approximately 6 bar; if this is not the case, adjust by acting on the regulator knob (C).

User's compressed air production system

The compressed air production system must be designed, installed and maintained in compliance with the applicable prescriptions indicated in the safety regulations in force.

To high obtain quality compressed air, note that:
- maintenance and operation of the compressors, the auxiliary systems and the primary systems must be in compliance with the manufacturers' instructions and specifications;
- the lubricant must comply with the specifications given by the compressor manufacturer;
- the compressor or its suction line must be positioned in an area having the lowest possible level of pollution caused by exhaust fumes from vehicles, industrial processes, etc.;
- a filter should be installed on the compressed air line as close to the user point as possible.

Air quality:
- To obtain the best possible performance and the maximum lifetime of the pneumatic system use compressed air having a dew point between +2°C and + 10°C. It is essential to install a cooler -dryer
- Use a separate air filter, installed as close to the user point as possible. Flush the line with compressed air before connecting it.

For correct use of compressed air, in general terms, consult the following reference standards:
- ISO 8573 – 1, this standard defines the industrial compressed air quality for general use without considering the quality of air at the compressor outlet.
- The compressed air quality level for special applications must be based on the value resulting from a large number of measurements taken during a specific time period and in clearly defined operating conditions.

For the required minimum pressure value, the nominal working pressure and the air consumption expressed as a mean value for correct machine operation, please refer to heading "TECHNICAL CHARACTERISTICS".

Compressed air isolation device

The compressed air isolation device, as can be seen in the "pneumatic diagram" supplied with the machine, is supplied for the sole source of the machine compressed air supply and is of the "isolating shut-off valve" type. This device is identified with the wording, visible in normal conditions of use, "PNEUMATIC SUPPLY ISOLATOR DEVICE".

The unit is located outside the machine's base.

4. INITIAL START-UP AND USE OF THE MACHINE

DANGER - WARNING
THE MACHINE MUST ONLY BE OPERATED BY AUTHORISED AND DULY TRAINED PERSONNEL WITH ADEQUATE TECHNICAL EXPERIENCE.
MACHINE OPERATORS MUST BE AWARE OF THE FACT THAT KNOWLEDGE AND IMPLEMENTATION OF THE SAFETY RULES ARE AN INTEGRAL PART OF THEIR WORK.
UNQUALIFIED PERSONNEL MUST NOT BE ALLOWED ACCESS TO THE MACHINE'S OPERATING AREA WHILE IT IS IN USE.

Before switching on the machine, operators should:
- carefully read all the technical documentation
- know which protective equipment and emergency devices are available on the machine, where they are located, and how they work

The partial removal of safety guards and warning signs is forbidden.

Unauthorised use of commercial parts and accessories belonging to safety guards and safety devices can result in malfunctions and the occurrence of hazardous situations for operators.

Before starting the production cycle, the operator must be thoroughly familiar with:
- The position, function and use of all controls.
- The position, function and use of all safety devices.
- The machine's characteristics.
- This manual, and know how to consult it.

The operator must also have been appropriately trained.

4.1. WORKSTATIONS AND OPERATORS' TASKS

The machine described herein is designed to be run by 1 operator suitably trained and instructed with regard to residual risks. The operator must have the same skills, in terms of safety, as the maintenance technicians and adequate professional competence.
The normal work area of the operator and relevant tasks/assignments are:

- The manual introduction/removal of mouldings onto the working bench, with the fixed safety guards closed and locked.
- The manual loading of V-nails in the magazine, with the fixed safety guards closed and locked.
- The adjustments and tooling of the main machine units (head, front clamp, fences, etc.) needed to operate the machine, using the relevant tools available, with the fixed guards closed and locked.
- The manual removal of V-nails jammed in the magazine and/or nailing head, with the fixed safety guards closed and locked.
- Monitoring operations (for example reading the data on the console panel and machine instrumentation). These are very simple tasks which can be carried out in total safety and clearly described in the Instruction Manual.
- General monitoring of machine operation - for example checking the cleanliness of the machine, etc. In the event of a problem, the operator must not intervene, but simply call the Maintenance Service.
- Cleaning external and internal machine parts, and any other parts that may require cleaning (e.g. the upper/surrounding part of counter-rotating rollers) via the fixed safety guards, while these are closed and locked. Any cleaning of internal machine parts which requires the removal of the fixed guards must be performed by a qualified maintenance technician.

The operator is responsible for the operating process, and must control the machine by means of the command actuators located on the control panels.

Apart from normal machine operation, the operator must also start and stop the machine in normal conditions, and stop it in emergency conditions.

The operator must also carry out checks and general monitoring operations while the machine is running. In the event of a problem he/she must not intervene, but simply call the Maintenance Service.

All operations performed by the operator must be carried out with all protection devices activated, all guards in place, and all safety devices engaged in order to prevent the risk of injury to arms, legs and other body parts.

All handling operations, preparation, adjustments, installation and connection of power supplies, along with fine-tuning and operating checks, must be carried out by trained, skilled maintenance personnel.

All maintenance and control operations must be carried out by trained and skilled maintenance personnel.

All installation and hook-up operations must be carried out using suitable equipment and tools of an appropriate size (e.g. a flathead or Phillips screwdriver, hex wrenches, Allen keys, etc.), depending on the type of fasteners.

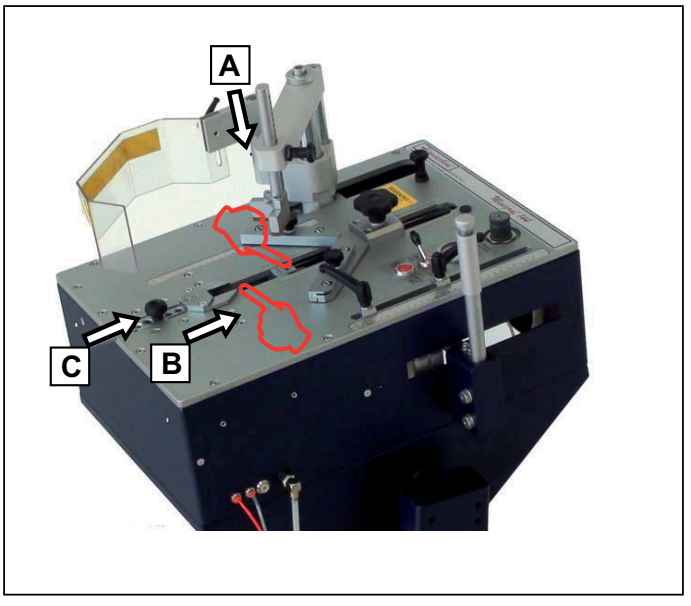
Before carrying out any installation or hook-up operation, the machine and any on-board components must be thoroughly cleaned.

DANGER – CAUTION
Unless otherwise specified in the contract and clearly indicated in the technical specifications of this Manual, the machine is not suitable for use in environments different to those permitted and duly specified in this Manual.

The main hazardous work areas of the machine, that may produce risks for the operator, are:

- The area beneath the clamp, inside the magazine and near the firing head.
- The area in front of the front clamp.
- The area around the front clamp slide if removed.
- The area inside the machine during adjustment, tooling and cleaning operations.

Schematic indications of the danger zones for machine fitters:
A. area under the vertical clamp
B. area in front of the front clamp
C. area around the front clamp slide if removed.



4.3. CHECKS, ADJUSTMENTS AND START-UP

All functions/operations pertaining to operating modes must always comply with safety measures and the prescriptions for the protection against residual risks.
During normal production, the machine must only be used to process the products specified herein.

During the working cycle, it is essential to comply with safety measures and prescriptions for the protection against residual risks.

4.4. START-UP

Insert the compressed air supply connector into machine inlet.	
If there is a filter unit, insert the compressed air supply connector into filter unit inlet.	

Filling the V-Nail cartridge

Insert the V-Nails as follows:
(A) Switch the PLV valve (1) lever to the OFF position.
(B) The V-nail pusher cylinder opens.
(C) Insert the stick of V-Nails in the magazine (2), ensuring that the sharp part (glue-edge side) is facing upwards, and that the “V” is positioned as shown in the photo
(D) Switch the PLV valve (1) lever to the ON position.

To insert V-nails of the same type in the magazine, there is no need to remove the cartridge. The V-nail stick can be inserted from the top through the free zones envisaged for moving the fences unit or the V-nail firing unit as illustrated in the figure (2).

1

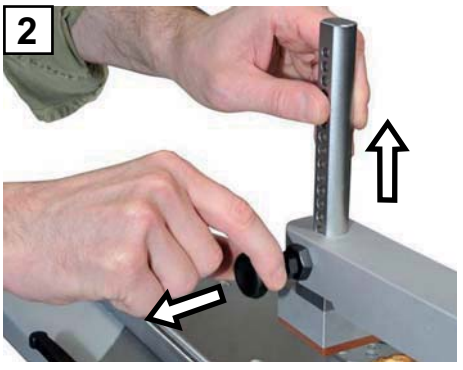
Replacing the V-nail cartridge

To use V-nails of a different size it is necessary to change over the cartridge by removing it from the magazine.

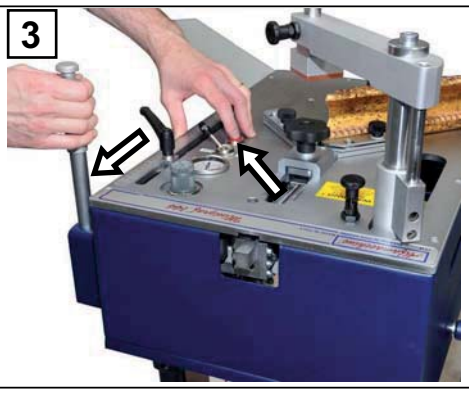
2

This is a simple operation performed in the following steps:

1. Switch the PLV valve (1) lever to the OFF position to open the V-nail pusher.



2. If necessary, to overcome the locking knob on the mobile fence, lift the vertical clamp by pulling out the spring-loaded knob.

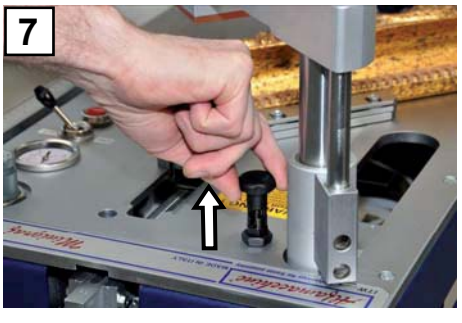


3. Press the red button to move the carriage beyond the upper travel stop.

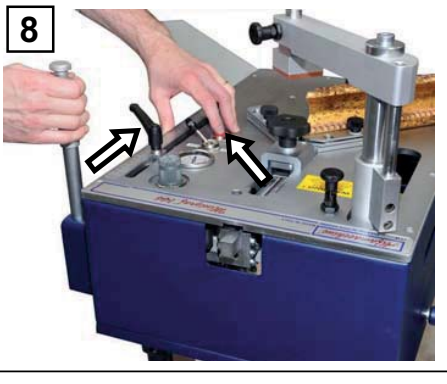
4. Pull the cartridge out.

5. Insert the new cartridge in the magazine, keeping it slightly slanted and then press it downwards.

6. Press the cartridge in fully until it locks into position.



7. Lift the carriage release knob.



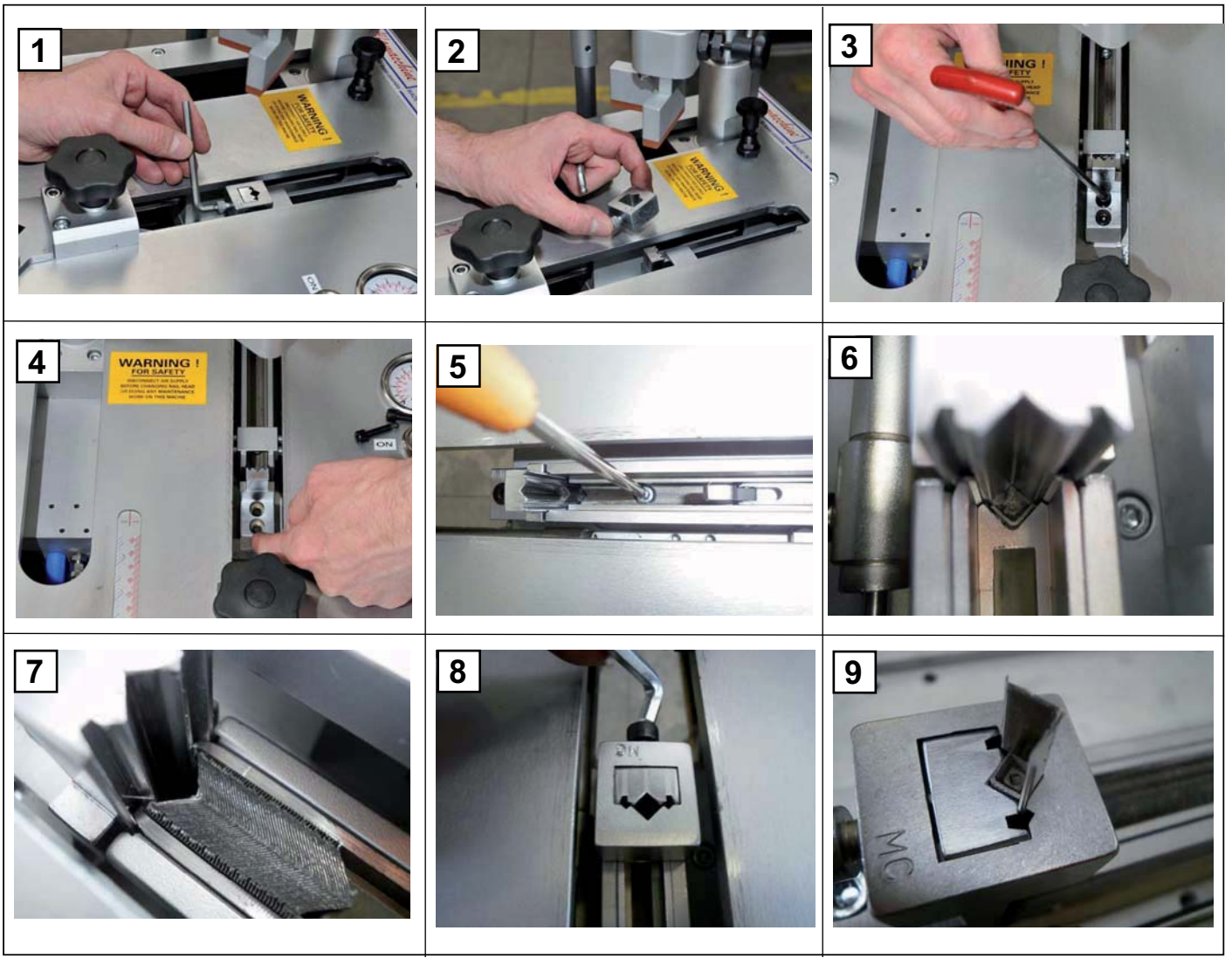
8. Press the red button to move the carriage back within the travel stops and reposition the vertical clamp.

V-nail firing unit alignment

Mechanical alignment of the V-nail firing unit is necessary following: slackening occurring over time, wear on the components, jamming during firing, replacement of parts, maintenance operations. The parts which need to be aligned are: head, L-shaped support, hammer, magazine and V-nail cartridge.

To complete mechanical alignment, proceed as follows:

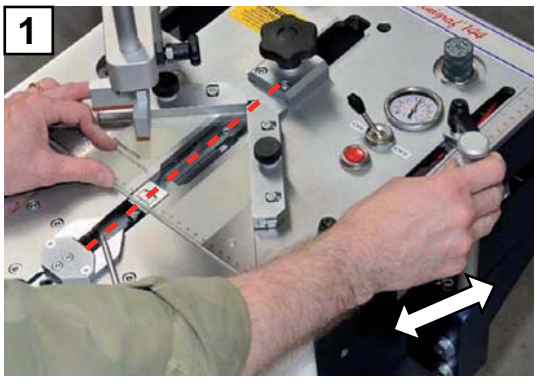
1. Undo the Allen screws which secure the head to the L-shaped support.
2. Remove the head from the L-shaped support.
3. Slacken the screws which secure the L-shaped support to the carriage top.
4. With the hammer in the high position, move the L-shaped support towards the hammer and tighten the Allen screws.
5. Move the magazine towards the L-shaped support after slackening the two M5 screws which hold the magazine in place.
6. Check that the V-nail cartridge and the L-shaped support are perfectly aligned.
7. Insert a V-nail in the cartridge, rest it against the L-shaped support to check that the V-nail legs are precisely in the guide.
8. Replace the head on the L-shaped support and secure in place with the relative screw
9. Insert a stick of V-nails in the cartridge and fire a V-nail (into nothing) to check that it comes out properly. The V-nail must run precisely between the L-shaped support and the head with minimum clearance, without there being any resistance.

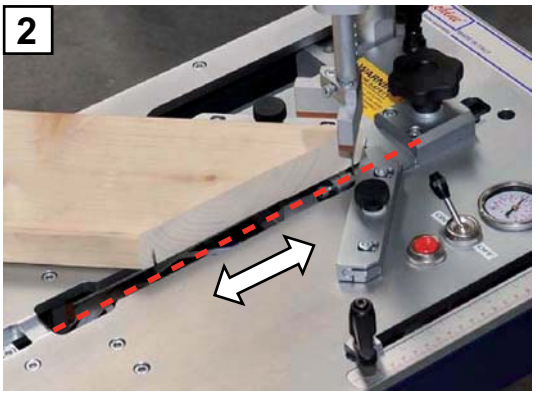


Adjustment, alignment and tilting of the fences.

1. To check correct positioning for 90° frames, you can ask Alfamacchine to provide you with the transparent right-angle set square on which the height is shown by a serigraph line.
   Position the set square up against the fence and activating the handle, move the head along the whole route making sure that the centre of the head is aligned with the line marked on the set square.

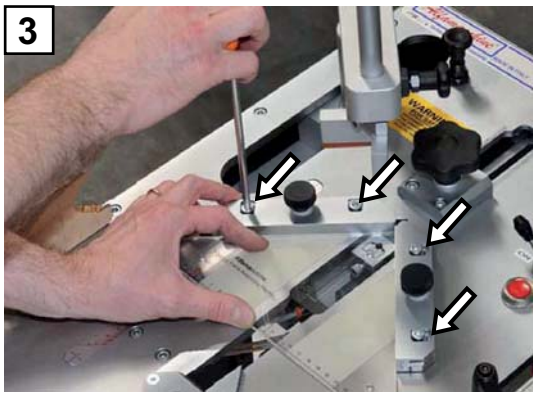
2. Another way to align the fences is to use a reference moulding which has a very precise 90°, 120° or 135° cut, depending on the fence used.
   Position the reference moulding up against the fence and activating the handle, move the head along the whole route making sure that the centre of the head is aligned with the cut edge of the frame piece.
   Repeat the operation for the other fence.





3. To correct the angle of the fences, slacken the 4 fixing screws, adjust the position making use of the length of the slots, and then tighten the screws.

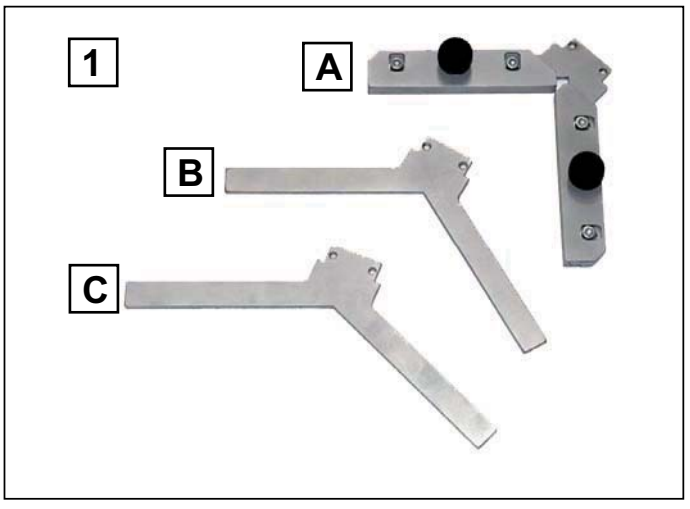
4. The mouldings may have an outer edge which slants slightly. To achieve better contact between these mouldings, the slant along the contact edge of the guides can be adjusted.
   Turn the knobs as shown in figure alongside to achieve the correct contact tilt in relation to the working bench.



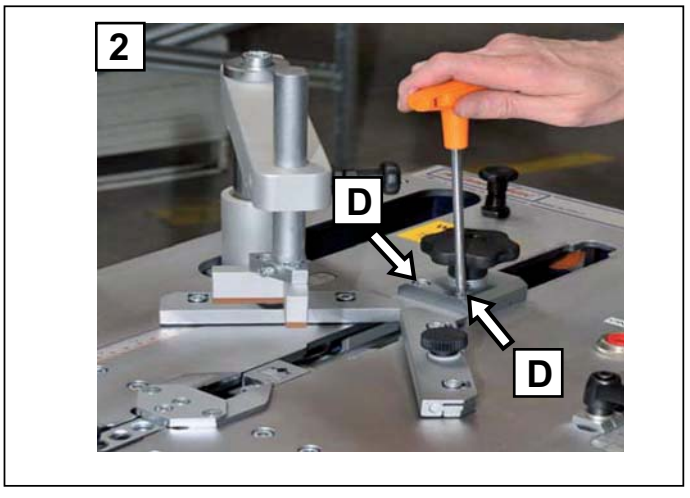
Optional fixed fences

1. To vary the contact angle, it is necessary to replace the fixed fence unit with one offering the required angle.
   The fence unit for joining 90° mouldings (A) (four-sided frames) is supplied as a standard component.
   By installing fence (B) (optional) the machine can be used to join mouldings at 120° (6-sided frames).
   By installing fence (C) (optional) the machine can be used to join mouldings at 135° (8-sided frames).

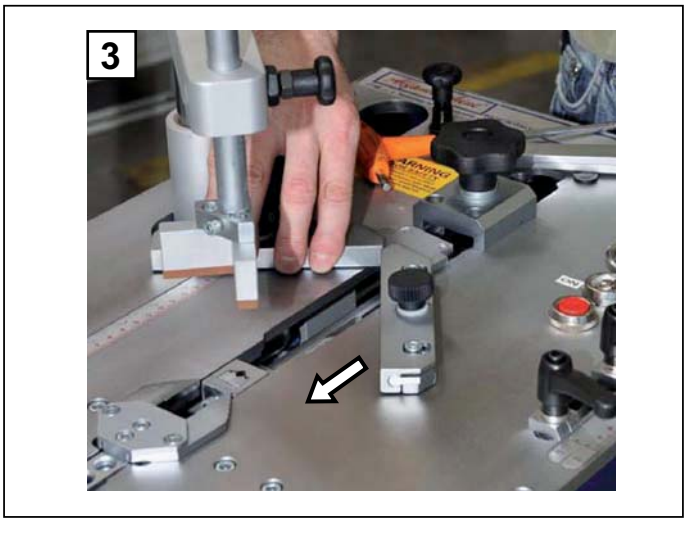
NOTES: The declared stroke of the machine (200 mm) is determined depending on the use of the standard 90° fence unit.
If, however, fences with different angles are used (120° or 135°) the overall stroke is reduced because they take up more room.



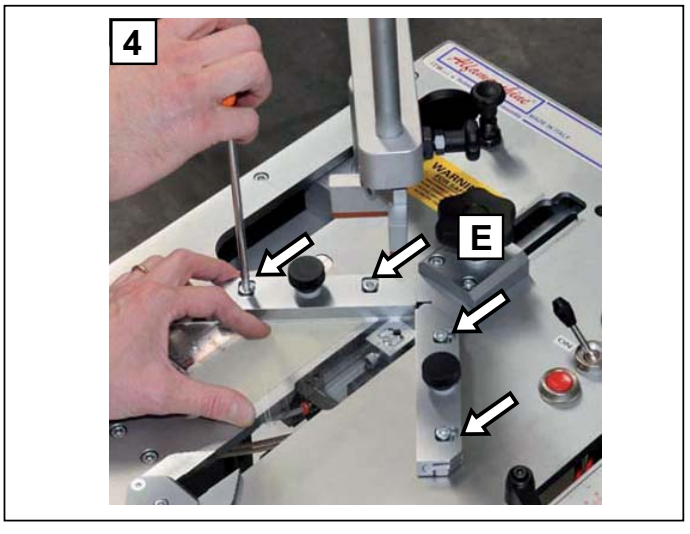
2. To replace the fence unit, undo the 2 Allen screws (D).



3. Once the screws (D) have been taken out, remove the fence unit.
   To install a different fence unit, repeat the above operations in reverse order and tighten the Allen screws.

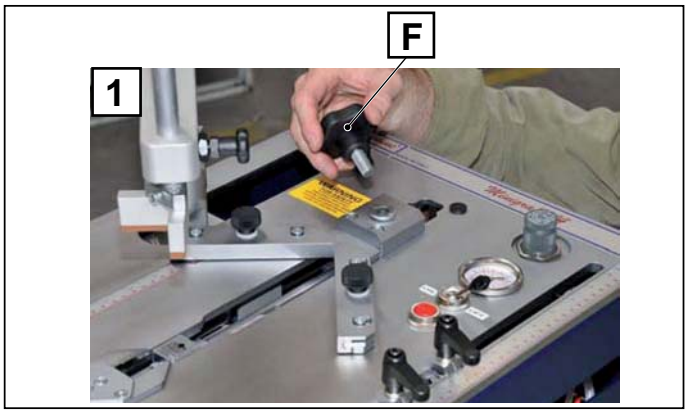


4. If the fixed square is without guides, it is necessary to remove the guides from the old fence unit and transfer them to the new one.
   To perform this operation, simply act on the 4 screws (E) indicated in the figure.

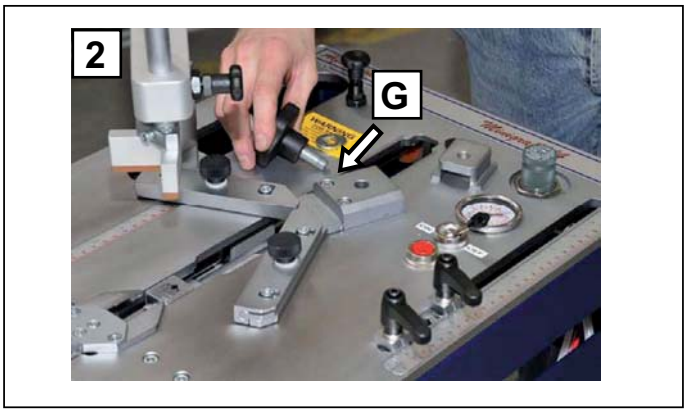


Disassembly of the fence unit

1. To disassemble the fence support, simply undo the clamp knob (F).

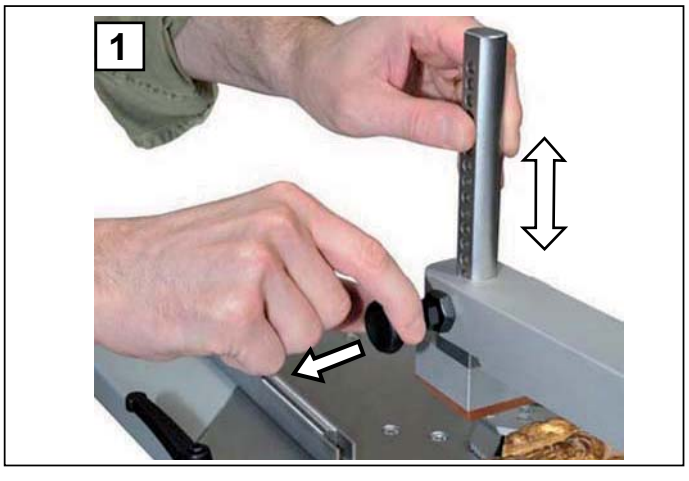


2. Once the knob has been unscrewed, remove the slide (G) from the bottom of the working bench.

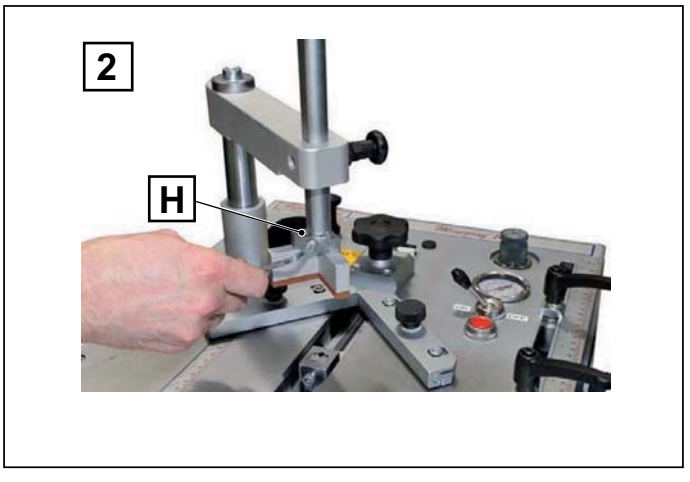


Vertical clamp height adjustment and replacement

1. To adjust the position of the clamp to the thickness of the frame, proceed as follows:
   a. Pull out the spring-loaded knob.
   b. Lift or lower the punched rod as required.
   c. Release the spring-loaded knob to block the rod.

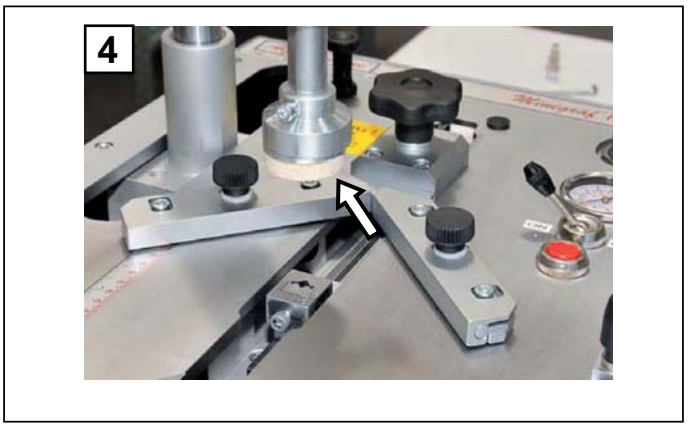


2. To replace the pressure plate, undo the screw (H) which secures it to the rod and pull it off downwards.



3. Once the new mechanical pressure plate or magnetic pressure plate holder has been installed, tighten the Allen screw.

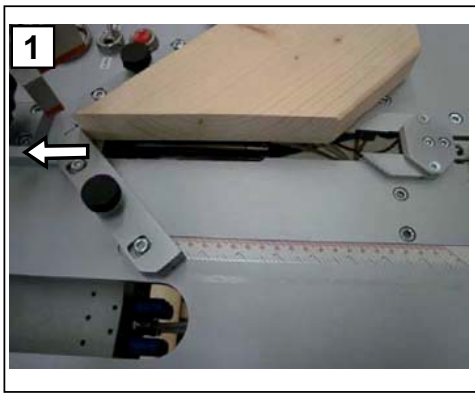
4. Position the magnetic accessories under the pressure plate and check the correct position by inserting mouldings to be joined.

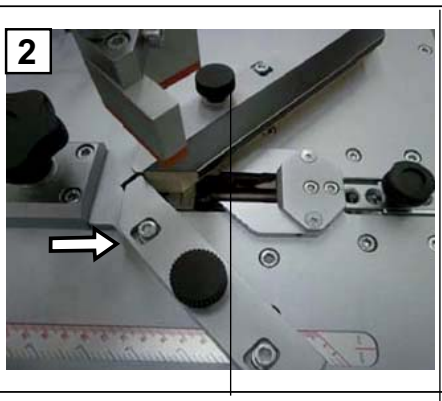


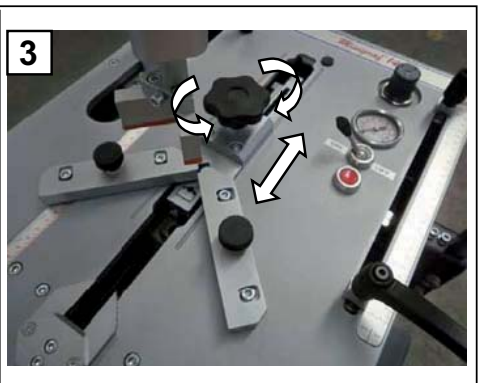
Front clamp and mobile fence adjustment

Based on the size of the frames to be assembled, a series of adjustments must be made to the front clamp and mobile fence unit. The relative procedure is described below:

1. If the moulding is wide, the mobile fence unit needs to be moved towards the back of the machine.
2. If the moulding is narrow, the mobile fence unit needs to be moved towards the front locking clamp.
3. To slide the mobile fence unit over the working bench, slacken the knob by turning it anti-clockwise, and once the correct position has been found, secure the fence unit in place by turning the knob clockwise to tighten it.
4. Usually the front clamp does not need moving.
   Should the position of the front clamp need changing, unscrew the knob and remove it. Move the punched rod to the required position and secure in place.
   The optimum space which should be left between the front clamp and the mouldings is at least 10 mm (1/2 inch).



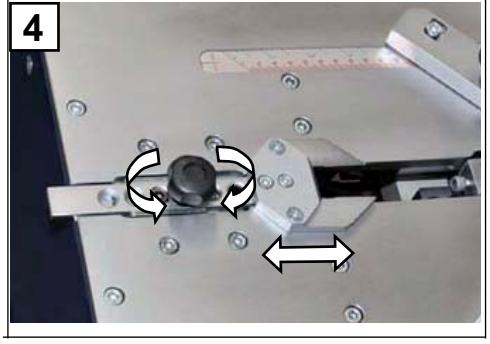




Adjusting the pressure of moulding clamping devices

The procedure for adjusting the pressure of vertical and front moulding clamps is described below.
The blocking pressure of the front clamp is in any case limited to 2 bar.
The work pressure must be suitable for the hardness of the mouldings to be joined.
Adjust the clamping pressure in such a way as to avoid crushing or damaging the surface of the material to be joined, but ensuring that the thrust of the hammer for inserting V-nails does not cause the moulding itself to lift.
The harder the material to be joined, the greater the pressure that can be applied to the clamping devices.
To correctly assemble the mouldings, the operator must always check they do not lift up when V-Nails are being inserted.
An excessively low work pressure may result in the incomplete insertion of the V-nail in the frame.
The working pressure is adjusted by turning the pressure regulator knob (A) located on the working bench.
The working pressure value can be read on the pressure gauge (B).
To alter the operating pressure, proceed as follows:

1. Lift the knob by about 3-4mm.
2. Turn it clockwise to increase the pressure, or anticlockwise to reduce the pressure.
3. Press the knob to lock it back in place.



The following operating pressure values are recommended:

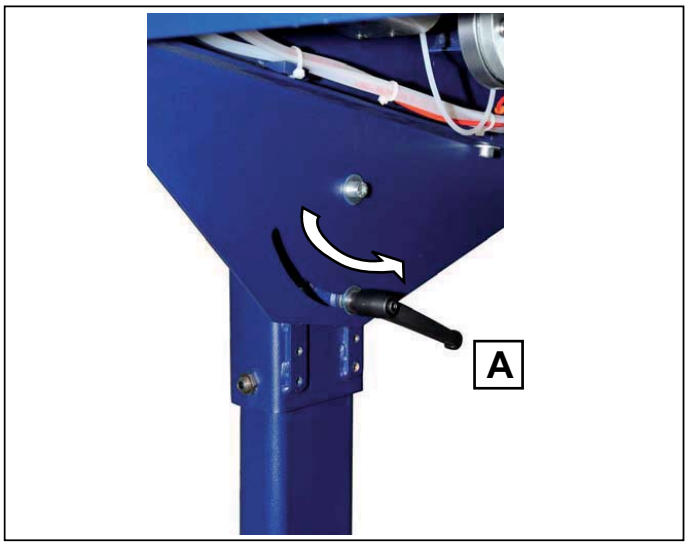
Type of wood		Pressure	Thrust
Soft	Samba, etc.	2 - 3 bar	100 kg
Medium	Ramin, etc.	3 - 5 bar	150 kg
Hard	Oak, etc.	5 - 7 bar	200 kg

Increase the pressure by about 10 - 20% for H15 or overlapping V-nails.

Adjusting the tilt of the working bench

Depending on the operator's needs, the working bench can be tilted.
To carry out adjustments, proceed as follows:

1. Slacken the handle (A) located on one of the support stand legs, under the working bench.
2. Slowly tilt the working bench to the required position.
3. Re-tighten the handle once the required position has been achieved.

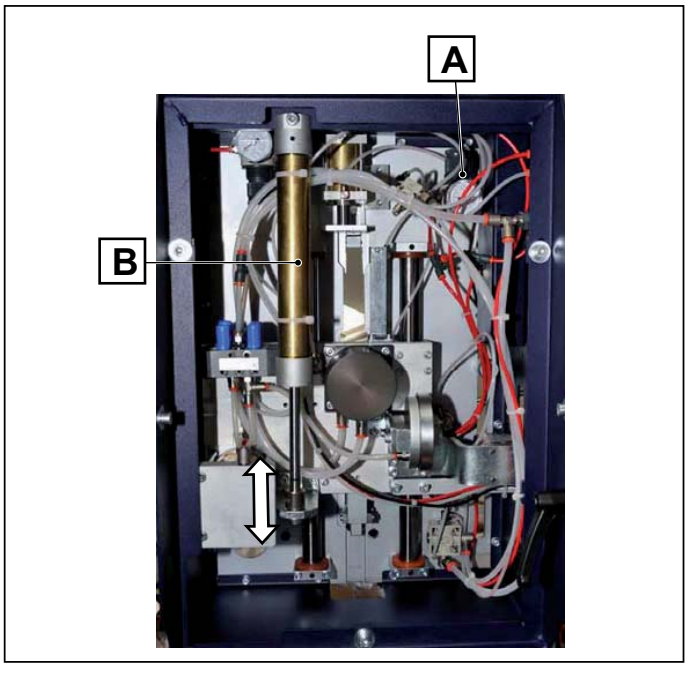


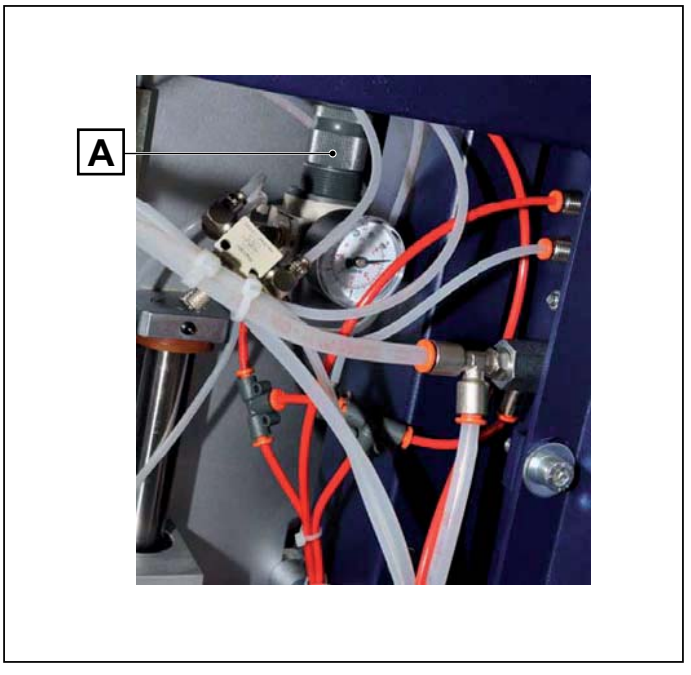
Regulation of the balancing system

The machine is fitted with a carriage balancing system
When working with the machine on a tilt, the balancing system pressure needs to be regulated by acting on the pressure regulator (A) located under the machine.
This system makes it easier to move the V-nail firing unit activated by the operator using the relative handle which, due to the effects of gravity caused by the machine tilt, would otherwise be very heavy to move.
To calibrate the balancing system, proceed as follows:

1. Tilt the machine until the desired gradient is achieved.
2. Lift the pressure regulator knob (A) and turn it clockwise to increase the pressure or anti-clockwise to decrease it. The pressure regulator acts on the balancing cylinder (B) connected to the V-nail firing unit carriage.
3. Move the handle along the route to verify correct balancing.

If calibration is correct, the V-nail firing unit must remain in the position in which the handle is left. If it falls, increase the pressure, if it lifts, decrease the pressure.



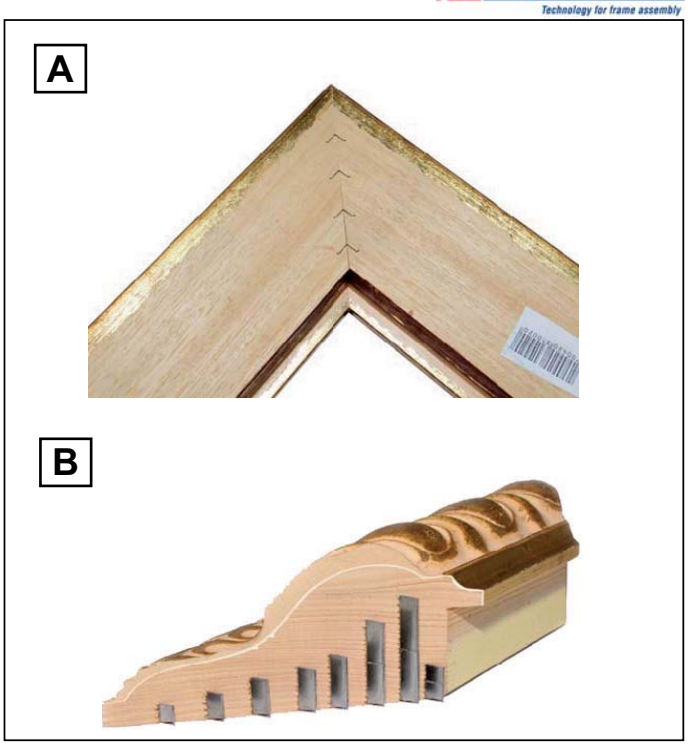


Adjusting V-Nail positioning

The machine is equipped with a mobile V-nail firing unit, assembled on a carriage controlled manually by acting on a handle.
The maximum stroke of the carriage is 200 mm. Within this stroke, multiple V-nail insertion points (A) can be defined.

(A) This picture shows 4 V-Nails inserted along the join between 2 mouldings.
(B) Depending on the thickness of the frame, two or more V-Nails can be inserted in the same point.

As well as blocking the moulding, the braking system (AFC) guarantees perfect locking also of the V-nail firing unit during multiple insertion of V-nails in the same position.



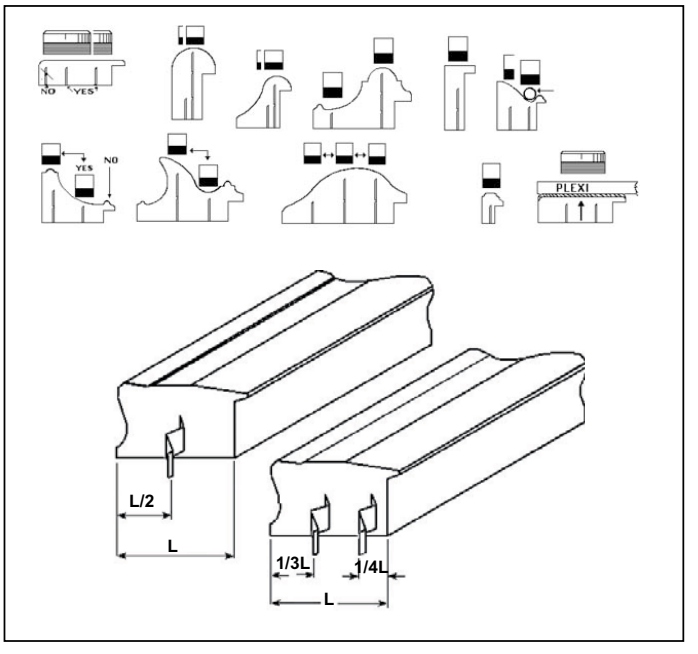
SUGGESTIONS FOR MAKING PERFECT JOINS

1) V-Nail types

In order to ensure that the machine can make top quality joins using a wide variety of materials, different V-Nails are available with different degrees of sharpness suitable for use with different hardness values and characteristics of the materials being handled.
V-Nails can be divided up into the following categories:

Material	Recommended sharpness
Soft wood and plastic	SW transparent stick
Medium/Hard wood and MDF	HW Brown stick
Very hard wood and HDF	RHW Red stick

! It is advisable to carry out a check on the material in question for selecting the most suitable sharpness.

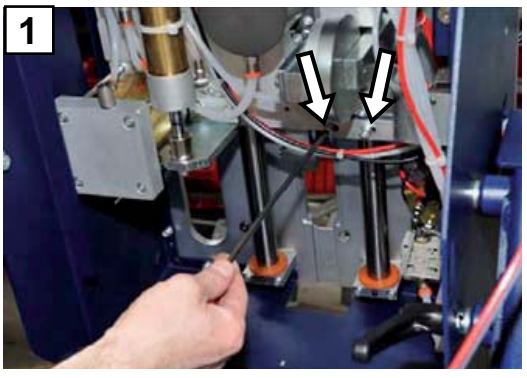


2) Stapling positions

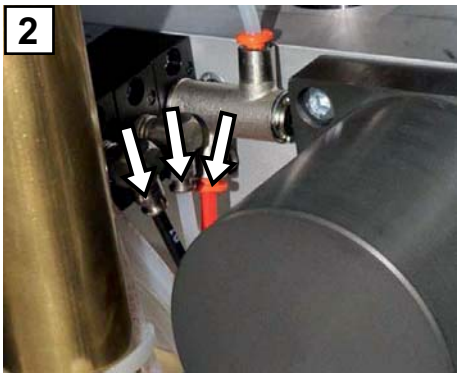
The following guidelines are designed to help you get the best results in terms of quality joins:
- Avoid inserting V-Nails close to the moulding edge. The minimum recommended distance from the outer edge is at least 10mm.
- When creating a join with just one V-Nail, position the V-Nail on the centre line of the frame.
- If you wish to insert 2 or more V-Nails for each join, it is advisable to insert the outer V-Nail at 1/3 from the outer edge and the inner V-Nail 1/4 from the inner edge.
- Position the vertical stopper as shown in the figure.

Handle positioning

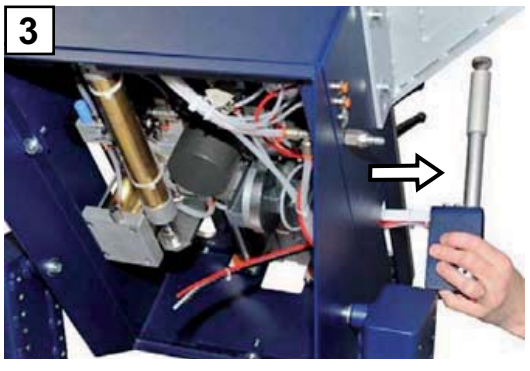
The machine is designed to operate with the handle installed on either the left- or right-hand side.
To change its position, proceed as follows:



1. Remove the 2 screws which secure the lever to the carriage.

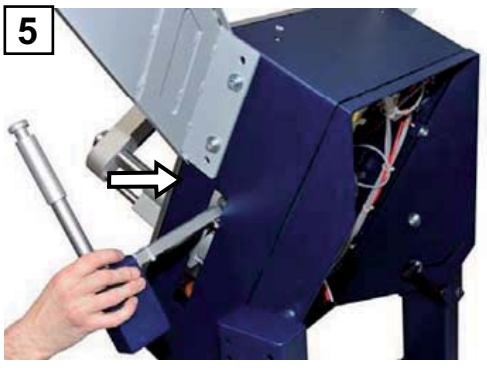


2. Extract the 3 pipes from the connectors, taking care to remember the exact position of each one (black, white and red).

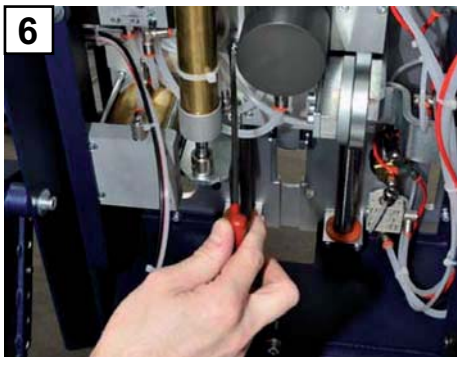


3. Remove the handle from the machine.

4. The dismantled handle appears as shown in the photo with 3 pipes (black, white, red) connected to the button activated pneumatic valve.



5. Install the handle on the opposite side of the machine.



6. Secure the handle to the carriage using the 3 screws and connect the pipes to the exact same connectors as before.

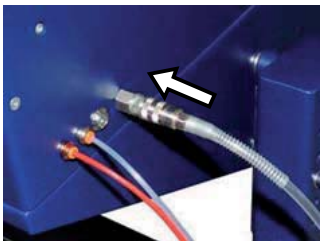
4.5. WORK CYCLE

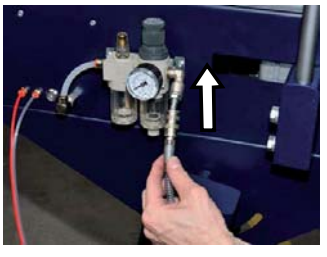
DANGER – CAUTION
During normal use, the machine must only process the products/materials indicated in this manual.

Safety measures and the indications on residual risks must always be observed during machine operation.

Check that the V-nail magazine is full, that the head is installed correctly and all necessary adjustments have been made.

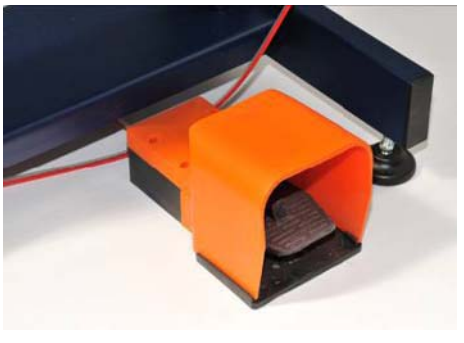
Insert the compressed air line directly into the machine or filter unit (if installed).





The machine is ready to join mouldings. First insert the moulding on the right-hand of the frame, then bring the left-hand moulding up against it.

Keeping the positioned mouldings still with your hands, press the pneumatic pedal to activate the front locking clamp.
Movement of the front clamp will block the mouldings against the fences so that one hand is now free to take hold of the handle to control the following operations.

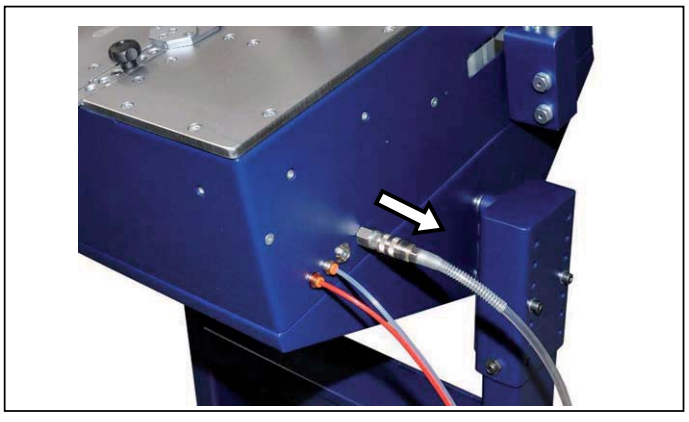


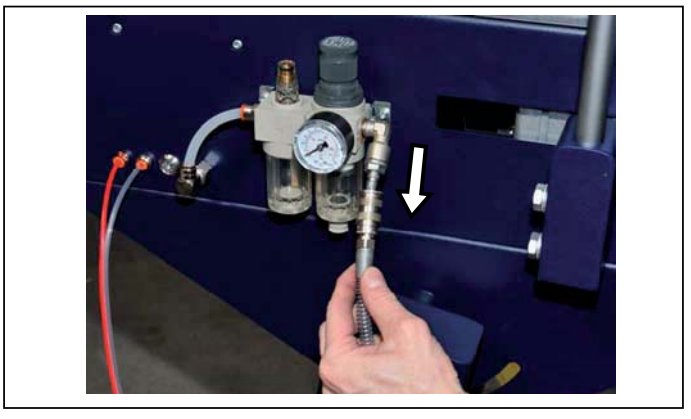
Move the V-nail firing unit carriage with the handle:
Press the button halfway down to block the frame pieces with the vertical clamp.
Press the button down completely to insert V-nails.
Release the button and move the carriage to the next position and insert another V-nail.

4.5.1. CYCLE STOP

PERICOLO – ATTENZIONE
DANGER - WARNING
THE MACHINE MUST BE DISENABLED AFTER USE.
THE COMPRESSED AIR LINE TO THE MACHINE MUST BE DISCONNECTED.
THE PNEUMATIC ACTUATORS WHICH MAY HOLD ACCUMULATED ENERGY, MUST BE DISCHARGED TO AVOID ANY HAZARDOUS INADVERTENT ACTIVATION.

If there is a filter unit on the machine, turn the knob to discharge the machine's pneumatic system, then disconnect the compressed air line.





5. MAINTENANCE, TROUBLESHOOTING, AND CLEANING

5.1. MAINTENANCE TECHNICIAN REQUIREMENTS

The term "maintenance" does not just cover periodical controls of normal machine operation, but also the analysis and consequent rectification of any of those problems which for any reason stop the machine from working properly or not at all.

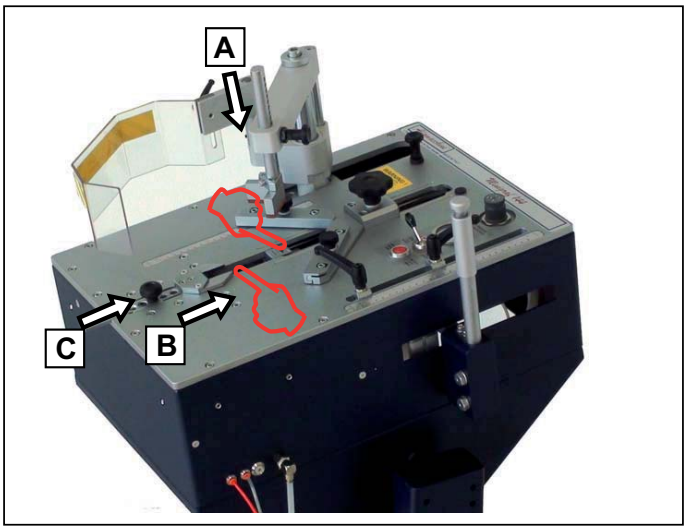
Specifically, personnel appointed to perform the servicing, cleaning, replacing of parts and troubleshooting, must work in compliance with the following aims:
1. limit the deterioration of wear parts.
2. reduce accidents to the absolute minimum.
3. reduce costs arising from faults.
4. limit the number and duration of interventions.
5. work in collaboration with the line operators to improve the efficiency of the plant.

5.2. WORK STATIONS AND MAINTENANCE TECHNICIAN DUTIES

The maintenance technician duties are:
- to perform tooling operations and adjust mobile parts on the machine,
- to calibrate, adjust and clean internal machine parts,
- to clean the inside of the machine (disassembling parts if necessary), carry out maintenance, lubrication, assistance operations, troubleshooting and the replacements of worn or damaged parts or structural elements.

The work zones that may present risks for the machine's maintenance technician are the following:
- the area relative to tooling, calibration, adjustment, lubrication, troubleshooting, worn and broken part replacement operations, as indicated in this instruction manual,
- the areas in and around the machine during the movement of mobile parts,
- the areas around the air lines,
- the areas around the fixed guards.

Schematic indications of the danger zones for machine maintenance technicians:
A. area under the vertical clamp
B. area in front of the front clamp
C. the area around the front clamp slide if removed.



5.3. MAINTENANCE PRESCRIPTIONS

DANGER - WARNING
ALL THE MAINTENANCE, CLEANING AND PARTS REPLACEMENT MUST BE CARRIED OUT SOLELY AND EXCLUSIVELY WITH THE MACHINE DISCONNECTED FROM ALL POWER SUPPLIES.

It is prohibited to perform any maintenance work on parts that are in motion.

5.4. GENERAL WARNINGS

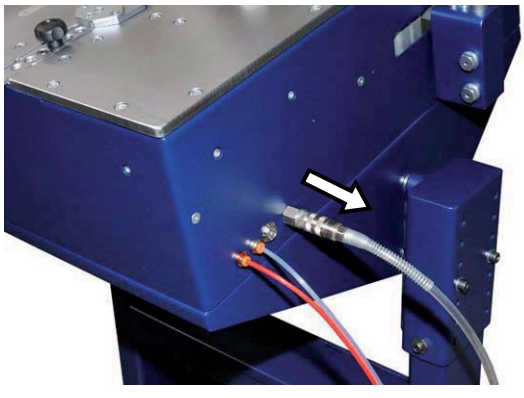
DANGER - WARNING
BEFORE PERFORMING ANY MAINTENANCE, CLEANING, REPLACEMENT OF PARTS AND TROUBLESHOOTING, PAY THE UTMOST ATTENTION TO THE DECALS AFFIXED TO THE MACHINE.
DURING ALL ACTIVITIES DO NOT TAMPER WITH OR DEACTIVATE ANY OF THE SAFETY DEVICES FOR ANY REASON, EITHER TO CREATE BYPASSES OR TO USE THEM FOR PURPOSES OTHER THAN THEIR INTENDED USE AS PRESCRIBED BY THE MANUFACTURER.

After performing any of the above tasks on the machine, reset and reactivate all the safety devices.
Do not tamper with or deliberately damage the protective screens nor remove or conceal the warning notices. In the event of deterioration or illegibility of the safety decals immediately order replacements from the supplier.

DANGER - WARNING
BEFORE PROCEEDING WITH MAINTENANCE, CLEANING AND/OR THE REPLACEMENT OF PARTS, ALWAYS PUT UP A SIGN WHICH IS CLEARLY VISIBLE INDICATING THAT MAINTENANCE OPERATIONS ARE UNDERWAY AND THAT THE MACHINE CAN ONLY BE RESTARTED AFTER HAVING DULY ASCERTAINED THAT ALL OPERATIONS HAVE BEEN COMPLETED AND ALL SAFETY GUARDS HAVE BEEN REPLACED.

5.5. ISOLATION FROM EXTERNAL ENERGY SOURCES

During maintenance, cleaning and replacement of parts, the machine must not be used and no commands must be transmitted.
Before performing any maintenance, lubrication, cleaning and replacement of parts etc. external energy supplies must be disconnected.
All disconnecting devices must be padlocked in the “0” (OFF) position.
Turn the knob to discharge any residual pressure from the pneumatic system and disconnect the compressed air line.



5.6. ROUTINE MAINTENANCE

Personnel responsible for carrying out the operations described in this chapter must have read, understood and consequently observe all the safety prescriptions, in particular:
1. waiting for the stopping times, before putting limbs or body parts inside machine danger areas,
2. the adequate use of personal protective devices and safety accessories needed to perform cleaning operations inside the machine’s danger areas,
3. It is prohibited to perform any repair or adjustment work on moving parts,
4. before performing any maintenance, cleaning and replacement of parts, the machine must be isolated from all energy supplies.

Furthermore, all general rules must be observed to keep the machine in perfect working order:
1. keep the machine clean and tidy,
2. avoid all damage,
3. avoid a situation wherein make-shift or urgent repairs become commonplace,
4. do not perform work on the machine which produces swarf; for example, should it be necessary to drill holes, carefully check that no residues end up in machine parts,
5. for disposal of worn or replaced materials, observe the relative legislation in force.

5.7. TASKS THAT CAN BE PERFORMED BY THE OPERATOR

A list of all the periodical checks/inspections, adjustment and control operations and ROUTINE MAINTENANCE operations which can be carried out by the machine operator is provided below.
The position of the machine components is shown in the layouts provided as an appendix to this manual.

FREQUENCY	CHECK	METHODS AND ANCILLARY NOTES
Before each work shift	Check the work area: • it must be clean and free of dust	The work area and all parts around the machine must be clean. All dust and foreign materials which could impede correct operation or compromise the original safety conditions of the machine must be removed. Remove all shavings from the machine with a jet of compressed air or a lint-free cloth. For all types of maintenance task or for the replacement of parts, call out the maintenance service.
Before each work shift	Check correct operation: • of the emergency stop device; • of the command/control system parts relative to safety	On the emergence of the slightest problem eliminate it by performing an inspection procedure that checks the correct mechanical operation of machine devices. For all types of maintenance task or for the replacement of parts, call out the maintenance service. Parts must always be replaced using original spare parts or at least parts which provide equivalent quality and safety .
Before each work shift	Visual inspection of condition: • of fixed guards	All fixed guards must perform the function for which they were designed. Check their condition, both on the internal and external sides of their surface, and check there are no signs of erosion or breakage. For all types of maintenance task or for the replacement of parts, call out the maintenance service.
When necessary	Visual inspection: • for jammed V-Nails	During operation V-nails may escape from the magazine and remain in circulation near the nailing head. Remove using the special magnet pen supplied with the machine. 
At least once a week	Visual inspection of condition • of all dataplates/decals.	If they are illegible new copies must be ordered from the manufacturer or in any case replaced by the user with equivalent ones showing exactly the same information as the original.

Parts must always be replaced using original spare parts or at least parts which provide equivalent quality and safety .
The instructions concerning replacement operations are not given in this manual and must therefore be explicitly requested from the machine manufacturer, who shall remain responsible for the replacement operations.

5.8. TASKS THAT CAN BE PERFORMED ONLY BY MAINTENANCE TECHNICIANS

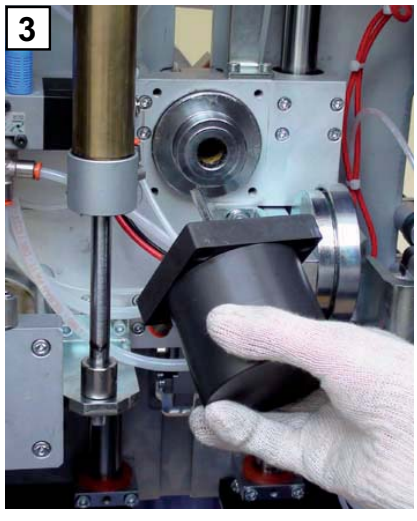
The ROUTINE MAINTENANCE operations which must be performed by a maintenance technician are indicated below.

The instructions concerning replacement operations are not given in this manual and must therefore be explicitly requested from the machine manufacturer, who shall remain responsible for the replacement operations.

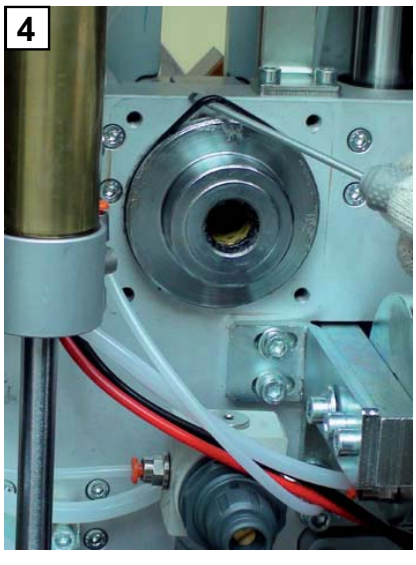
FREQUENCY	CHECK	METHODS AND ANCILLARY NOTES
Every 1,000,000 insertions	Check / replace: • seals and hammer	Proceed to remove the hammer to replace just the seals or the whole piston as illustrated below:

1. Slacken the locking handle on the support stand to tilt the working bench backwards.
   Disconnect the air supply from the machine.

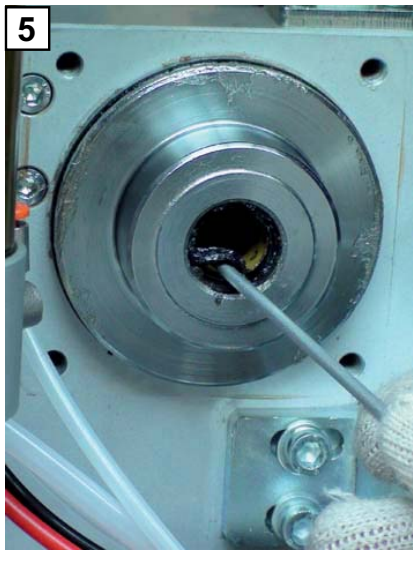
2. Disconnect the 2 pipes connected to the cylinder
   Remove the 4 Allen screws which secure the pneumatic cylinder to the head.



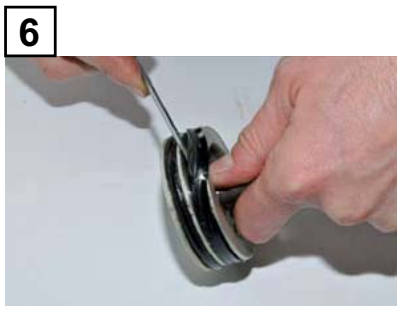
3. Remove the pneumatic cylinder and extract the hammer which may still be stuck inside.
   Remove all traces of dirt, wash with degreaser, check for signs of wear, grease all the internal surface.



4. Replace the external head seal using a screwdriver to facilitate the operation.
   Clean the seal seat well and grease.



5. Replace the internal lip seal on the head, using a screwdriver to facilitate the operation.
   Thoroughly clean the seat and the hole in which the bushing is installed and grease.



6. Remove the seals from the hammer, clean well and grease, check for signs of wear and/or splintering.
   Install new seals taking care to position the lip seal the right way round.

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7. It the hammer is worn out or splintered, proceed to replace the whole piston. The raised ends of the hammer must have marked edges to ensure correct insertion of the V-nails.

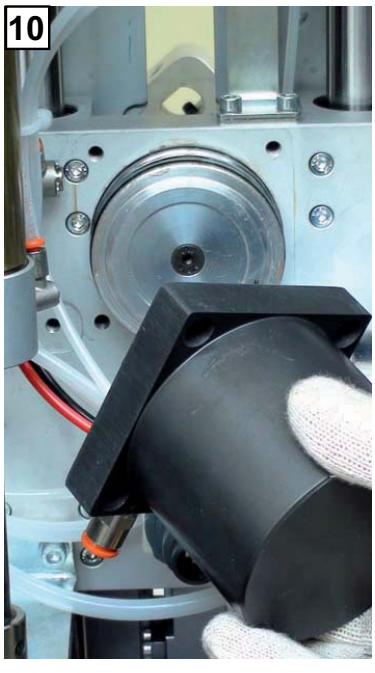
8

8. Grease the hammer piston and seals well then insert in the relative hole taking care not to pinch the lip seal.
If insertion proves difficult, it is advisable to remove the L-shaped support, the head and V-nail cartridge.

9

9. NB: align the hammer so that the high part of the piston has the 2 raised sides pointing towards the magazine.

10



10. Replace the cylinder and push it well up against the head.
Tighten the 4 screws and reconnect the air lines.

Once this operation has been completed, check alignment of the V-nail firing unit. L-shaped support, magazine and head.
Reconnect the compressed air supply to the machine and activate the hammer several times to check it moves correctly and that there are no mechanical hindrances.
Insert the V-nail cartridge and fire several V-nails to check that they come out of the head correctly.

FREQUENCY	CHECK	METHODS AND ANCILLARY NOTES
Every 5,000,000 insertions	Check / replace the L-shaped support.	Proceed with disassembly by following the instructions provided in the heading MECHANICAL ADJUSTMENTS / MAINTENANCE.
At least once a month		All parts inside the enclosures and machine compartments housing the motors must be kept clean and dry. Use suitable and normally available tools and equipment (e.g. vacuum cleaners and dry brushes to remove dust and absorbent cloths for removing moisture) to keep said areas of the machine in a suitable operating condition.
At least once a month	**Check the effectiveness:** • of mechanical connections	Use suitable tools and equipment to check the tightness of terminals, screws, nuts, bolts and connections in general on both the equipment and the machine.
At least once every three months	**Check the reliability and functionality:** • of fixed guards • of safety devices	**The necessary inspections concern:** • loss or damage to any part of the safeguards, especially if this entails a reduction in the safety function it is designed to perform, for example a reduction in resistance to impact caused by scratches/damage to Plexiglas panels. • replacement of wear parts • correct operation of interlocks • deterioration of joints or fixing points • deterioration due to corrosion, temperature variations or chemical effects • satisfactory operation and lubrication of moving parts, if necessary • modification of safety distances and size of openings • deterioration of the acoustic performance, if applicable. Replacement must be carried out when one of the components indicated displays anomalous wear and at the first sign of cracking, erosion or breakage. Parts must always be replaced using original spare parts or at least parts which provide equivalent quality and safety . Contact the manufacturer directly.

Parts must always be replaced using original spare parts or at least parts which provide equivalent quality and safety .
THE INSTRUCTIONS CONCERNING REPLACEMENT OPERATIONS ARE NOT GIVEN IN THIS MANUAl and must therefore be explicitly requested from the machine manufacturer, who shall REMAIN RESPONSIBLE FOR THE REPLACEMENT OPERATIONS.

5.9. CLEANING

DANGER – CAUTION
It is prohibited to manually clean, oil or grease moving machine parts and elements unless this is strictly necessary for some specific technical requirement. If this is the case all suitable measures must be taken to prevent hazards.
Workers must be informed by means of clearly visible warning signs.
Cleaning operations which can be performed by maintenance technicians are indicated below.

Normally, some cleaning operations can be performed by the machine operator; i.e., in the case of normal operations on the outside of the machine that call for the use of simple personal protective equipment.
The operations to clean internal parts of the machine must be carried out by the maintenance service.

To avoid inadvertent untimely and hazardous activation of the machine or unwanted and inadvertent modifications of any kind, cleaning operations should be carried out by the same personnel who usually work on the machinery rather than personnel from a cleaning company who may not observe all the recommendations indicated herein.

All cleaning operations must be carried out only after the machine has been cut off from external power supplies and all accumulated energy has been discharged.

DANGER – CAUTION
Never use petrol, solvents or other inflammable and/or corrosive fluids to clean the machine and the machine components.
Use exclusively commercial, approved non-flammable and non toxic solvents.

Comply with the methods of use and use all the necessary personal protective equipment specified by the supplier of such substances.

The machine and its on-board components must never be washed with water, especially not in the form of jets of any type or intensity; i.e. it must not be washed using buckets, hoses, or even sponges.
For the identification of the components mentioned and details on their position, refer to the “mechanical components” layout and the attached layout supplied with the machine.

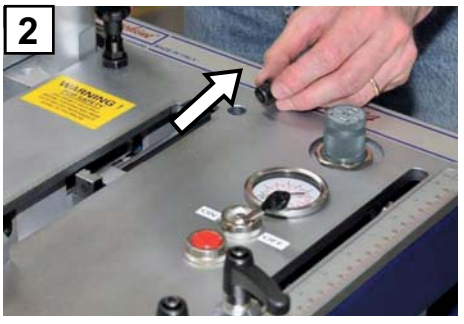
Fixed guards must be removed in order to gain access to some of the parts requiring lubrication.
Fixed guards are identified by the following sign:

Once all cleaning operations have been completed, all the fixed guards must be refitted and secured in place.

FREQUENCY	PERSONNEL	ZONE - METHODS
When necessary	Also machine operator	THE WORKING BENCH AND THE HEAD MUST BE KEPT CLEAN FROM ALL RESIDUES OF GLUES USED TO JOIN THE FRAMES. DO NOT USE WATER. USE A PETROLEUM BASED CLEANING PRODUCT.
When necessary	Also machine operator	THE V-MAIL MAGAZINE AND THE GUIDE MUST BE KEPT CLEAN FROM ANY RESIDUES AND DUST. DO NOT USE WATER. USE A PETROLEUM BASED CLEANING PRODUCT.
At least once a week	Also machine operator	• THE WORKPLACE AND THE CONTROL STATION MUST BE KEPT CLEAN AND TIDY. REMOVE ALL DUST AND DIRT. AN UNTIDY WORKPLACE INCREASES THE RISK OF ACCIDENTS. DURING CLEANING OPERATIONS, ALWAYS USE A DUST MASK AND ANY OTHER PPE PRESCRIBED FOR THE TYPE OF OPERATION BEING CARRIED OUT AND DEPENDING ON THE SUBSTANCES USED FOR CLEANING. COMPLY WITH THE METHODS OF USE AND USE ALL THE NECESSARY PERSONAL PROTECTIVE EQUIPMENT SPECIFIED BY THE SUPPLIER OF SUCH SUBSTANCES. • AVOID THE USE OF RUBBING ALCOHOL, BENZENE, SOLVENTS OR ANY OTHER TYPE OF DETERGENT ON NON-METAL PARTS WHICH, WHEN NECESSARY CAN BE CLEANED USING A NEUTRAL, NON-FOAMING, WATER-BASED DETERGENT ONLY . IF NECESSARY, METAL PARTS CAN BE CLEANED USING A LINT-FREE CLOTH DAMPENED SLIGHTLY WITH RUBBING ALCOHOL, TAKING GREAT CARE HOWEVER NOT TO COME INTO CONTACT WITH ANY ADJACENT OR NEARBY PLASTIC MATERIALS. NEVER USE ABRASIVE PRODUCTS, COLOURED SUBSTANCES, METAL SCOURERS, WIRE BRUSHES, SCRAPERS, ETC. • COMPLY WITH THE METHODS OF USE AND USE ALL THE NECESSARY PERSONAL PROTECTIVE EQUIPMENT SPECIFIED BY THE SUPPLIER OF SUCH SUBSTANCES.
At least once every six months	Maintenance technician	• Remove all rust marks that may have formed on unpainted surfaces during transport or storage. For this operation use a specific commercial antirust agent. • Comply with the methods of use and use all the necessary personal protective equipment specified by the supplier of such substances • Remove the double-action purifying filter (centrifugal for capturing large particles of impurities and condensate and filtering for the smaller solid particles suspended in the air) located in the compressed air supply hook-up zone. • CONDENSATE IS DRAINED by means of the special valve (A) on the bottom of the collection cup (B). The cups can also be taken out for cleaning. • CONDENSATE MUST ALWAYS be drained before it reaches the level of the filtering elements or the filter separators. • When cleaning, do not use synthetic solvent-based degreasing substances. • Once the filters are clean they can be refitted in the places from which they were removed and the grilles must be refitted and fastened in place. Wear a dust mask during cleaning procedures. 

FREQUENCY	PERSONNEL	ZONE - METHODS
At least once every six months	Maintenance technician	THOROUGHLY CLEAN THE MAGAZINE AND V-NAIL CARTRIDGES. THIS OPERATION INVOLVES DISMANTLING THE MAGAZINE AS FOLLOWS:

1. Press the red button and move the carriage beyond the upper travel stop.



2. Remove the plug from its seat.

3. Remove the screw which fastens the magazine to the V-nail pusher pneumatic actuator.

4. Remove the 2 Allen screws.

5. Remove the magazine.

6. Remove the V-nails, the cartridge and proceed with cleaning operations using a cloth and a brush. Do not use water. Repeat the above operations in reverse order to reassemble.

5.10. LUBRICATION

During lubrication operations:
1. Avoid bringing oil and/or grease into contact with the skin.
2. During oil and/or grease changes use protective gloves.

Both spent and fresh lubricants are highly polluting: for disposal of lubricants consult your lubricant dealer or contact a specific toxic waste disposal company.

All lubrication operations must be performed:
1. after first cutting off all external energy supplies,
2. strictly observing the safety indications given in the “safety datasheets” provided with each individual lubrication product used.

The lubrication operations which must be performed by maintenance technicians are indicated below.

To obtain high performance and faultless operation, it is important to lubricate moving parts of the machine on a regular basis.

The position of machine components which need lubricating is shown in the layout provided as an appendix to this manual.

For the disposal of spent oil and grease, observe the relative legislation in force.

Do not disperse spent oil in the environment. Consign it to specifically authorised collection centres.

NOTES
Fixed guards must be removed in order to gain access to some of the parts requiring lubrication.
Fixed guards are identified by the following sign:

Once lubrication operations have been completed, all the fixed guards must be refitted and secured in place.

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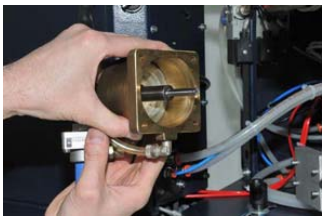
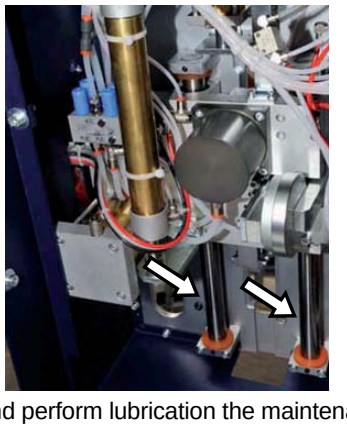
FREQUENCY	LUBRICATION	METHODS AND ANCILLARY NOTES
At least once every six months	Maintenance technician	Lubricate the hammer piston by following the instructions provided in the heading ROUTINE MAINTENANCE.   Lubricate the carriage guides located under the work surface.
When necessary	Maintenance technician	  To gain access and perform lubrication the maintenance technician must: 1. Isolate the machine from external power supplies. 2. Remove the fixed guards when necessary. 3. Using a brush, manually spread a layer of lubricant on the upper part of the sliding guides. 4. Refit and secure the fixed guards. **For lubrication, use SHELL grease.**
Every 200 hours	Hammer piston	Automatic lubrication of the pneumatic actuators. Make sure there is oil in the reservoir of the filter unit.  Remove the reservoir indicated by the arrow by turning it anticlockwise. Top up, if necessary, with CASTROL MAGNA GC 32 oil or equivalent. Reposition the reservoir in its seat and tighten by turning clockwise. Adjust the flow of oil which drops during air circulation. The correct frequency is 1 or 2 drops every 50 V-nailing cycles.

6. TROUBLESHOOTING AND RELEASE OF MOVING PARTS

Should any one of the mobile elements get jammed, to ensure it can be released in total safety, the operator must stop the machine and proceed to notify the maintenance staff unless he has been previously given the authorization to intervene in these situations.
The following section describes operations for troubleshooting and releasing moving parts that can be performed by maintenance technicians.
Before performing any work or investigations:

1. Install a sign indicating that maintenance is in progress on the machine
2. Make sure that the upline and downline connected machines do not constitute a source of danger or an impediment to the maintenance work; switch off said machines using the designated procedures.
3. Before restarting the machine, make sure there are no personnel still performing cleaning and /or maintenance operations on it.
4. For mechanical repair work, always seek the assistance of the manufacturer.
5. Always consult the machine manufacture in accordance with the methods specified on the initial pages of this manual.
6. Do not zero/reset the safety devices automatically by means of an external sequence without first checking and identifying the cause of the stoppage.

By observing any types of information that the machine control system provides, machine faults can be identified and interpreted.
All information devices (visual, audible) aimed at avoiding potential ergonomic hazards, with the relative explanations and the type of information the operator/s will receive are described in chapters 3 and 4.
Depending on the type of information, action must be taken to eliminate the cause that led to/generated the visual or audible alarm signal.

The PROBLEMS OR FAULTS which could lead to a MACHINE STOPPAGE are:

PROBLEM / FAULT	POTENTIAL CAUSE(S)	METHODS AND ANCILLARY NOTES
When the pedal is pressed right down and the button is pressed, V-nails are not fired correctly	Insufficient operating pressure	- Check that the minimum pressure value for the system is over 6 Bar. - Check that the operating pressure is somewhere between 4 - 7 bar. - Check that the pressure value indicated on the gauge is over 2 bar, this value depends on the hardness of the material being joined..
	V-nails badly positioned in the cartridge.	- Check that the sharpened part (edge with glue) is pointing up. - Check V-nails placement: - Check that the vertex of the “V” on the nail is pointing towards the rear of the machine or towards the fence unit. - Check that the V-nails show no signs of defects (poor gluing, uneven profiles, etc.), replace if necessary.
	V-nail guide channel (L-shaped support) is blocked or worn	Check that the V-nail guide channel (L-shaped support) is not dirty or clogged. Clean if necessary.
	Insufficient thrust on the V-Nails from the pusher	Check that the pressure of the reduction valve which supplies the V-Nail pusher cylinder is at least 2 Bar. If necessary increase by 10%.
	Faulty V-Nails	- Replace the V-nails
	Insufficient air pressure	Check that the air pressure from the compressor is at least 6 bar.
	V-nail magazine open	Close the magazine by acting on the relative lever valve (ON position). - Replace the pedal valve.
	Faulty valves	- Replace the control valves
Pressing the button a number of times, operation starts out correctly but becomes irregular.	Valves clogged by excess oil or condensate	Remove any excess oil or condensate from the valves by disconnecting the command tubes one at a time and getting the air out.
	Faulty valves	Replace the valves if necessary. - Replace the pedal valve. - Replace the control valves

./. Cont.

./. Cont.

PROBLEM / FAULT	POTENTIAL CAUSE(S)	METHODS AND ANCILLARY NOTES
When the button is pressed, the pressure shown on the pressure valve drops significantly (by over 0.7 bar)	Faulty pressure regulator	Replace the regulator
	Air supply line too long or with an unsuitable diameter.	Replace the line with one with a larger diameter.
	FRL reducer lubricator filter, if installed, is clogged.	Wash or replace the FRL lubricator filter
When the pedal is pressed the machine works correctly, but when the pedal is released there is a delay in repositioning of the columns and/or hammer.	Faulty or clogged valves	- Remove oil and/or condensate - Replace the pedal valve. - Replace the faulty control valves.
When wanting to insert more than one V-nail in the same place, they do not overlap in height or are inserted at an angle.	Unsuitable V-nails	Replace the V-Nails with more suitable ones.
	Incorrect clamping of the mouldings (the mouldings are moving during V-nail insertion)	- Check and if necessary correct the position of the vertical and front clamps. - Increase the pressure by acting on the pressure reduction valve.
	Warn hammer	- Replace the pressure plate - Replace the hammer
	Blocked hammer	Clean the upper part of the hammer, removing any product which may have got stuck on the upper profile.
	The V-nail firing unit is not at the same level as the working bench surface.	Adjust the V-nail firing unit so that it is at the same level as the working bench surface.
	Check that the AFC braking system is working properly	Replace the seals. Adjust the piston stroke by acting on the relative screw.
When working in a horizontal position the carriage tends to move towards the upper stopper and pulling the lever towards the bottom stopper is hard work.	Balancing cylinder powered.	Act on the pressure reduction valve and set the pressure to 0 bar.
Machine runs noisily.	Machine moving parts are not well lubricated.	Check and remove if necessary, any jamming of moving parts and/or perform lubrication as required.

7. REINSTALLATION AND REUSE

CAUTION - DANGER
MOVING AND REINSTALLING THE MACHINE IN A DIFFERENT LOCATION ARE HIGHLY DELICATE OPERATIONS WHICH CALL FOR SIGNIFICANT EXPERIENCE. CONSEQUENTLY TO ENSURE THAT THE OPERATIONS ARE CARRIED OUT WITHOUT ANY RISKS FOR PERSONNEL OR THE MACHINE, THESE OPERATIONS MUST BE CARRIED OUT SOLELY AND EXCLUSIVELY BY PERSONNEL APPOINTED DIRECTLY BY THE MACHINE MANUFACTURER OR AUTHORISED BY THE SAME.

8. EXTINGUISHING MEDIA

The indications on extinguishing media are of fundamental importance as any operations/interventions which are not carried out in compliance with the indications provided below or are not foreseen, may damage the machine, its internal components, the power supply system, the product being handled/produced not to mention injury to operators. Failure to observe the indications will also nullify the warranty.

CAUTION - DANGER
ALL OPERATIONS TO PUT OUT A FIRE MUST BE CARRIED OUT BY PERSONNEL WHO ARE ADEQUATELY INFORMED AND TRAINED CONCERNING THE RISKS AND HAZARDS THAT MAY ARISE DURING EXECUTION OF SAID ACTIVITIES. THEY MUST HAVE READ AND UNDERSTOOD THE SAFETY PRESCRIPTIONS PROVIDED IN THIS INSTRUCTION MANUAL AND BE IN GOOD PSYCHO-PHYSICAL SHAPE.

In the event of a fire break affecting the machine or the products it interacts with, always use CO2 extinguishers type C.

A fire extinguisher of this type must be kept next to the machine work station at all times.

9. SCRAPPING AND DISPOSAL

DANGER - WARNING
IF YOU DECIDE YOU NO LONGER WISH TO USE THE MACHINE DESCRIBED IN THIS MANUAL BECAUSE IT HAS BECOME OBSOLETE AND/OR IRREPARABLY DAMAGED OR WORN TO A POINT WHERE ANY FORM OF REPAIR WOULD NOT BE ECONOMICALLY VIABLE, IT MUST BE PUT OUT OF SERVICE AND RENDERED INOPERATIVE AND FREE FROM ALL POTENTIAL HAZARDS.

Decommissioning of the machine must be carried out by specialised and suitably equipped personnel.
If the client does not have the right personnel or tools to be able to proceed with demolition of the machine in total safety and in such a way as to safeguard the operators involved, he must seek the assistance of the machine manufacturer's technical staff.

Before starting the scrapping procedures display signs informing persons in the area that work is in progress.

9.1. SCRAPPING

NOTES
To be able to perform the necessary tasks in maximum safety, the areas around the machine, for a whole 360° and over a distance of at least 2000 mm, must be free of walls, other machinery, equipment or other elements, such as support pillars, which might get in the way.

The main sequential stages for dismantling and scrapping include the following (the list is provided as a guideline and is not exhaustive): disassemble all machine components and consign them to an authority or company for differentiated collection in compliance with the relative legislation in force.

All operations to disconnect the machine must be carried out using suitable equipment and tools of an appropriate size (e.g. a flathead or Phillips screwdriver, hex wrenches, Allen keys, etc.), depending on the type of fasteners.

During dismantling procedures do not enter the interior of the machine or climb under or on top of it for any reason: always work while standing alongside the machine.

Before disassembling parts and/or disconnecting and/or loosening any joining elements, take steps to ensure that the connected parts cannot subsequently fall on top of yourself or other exposed persons.

This must be achieved also using ancillary supports or restraints, or approved and certified lifting devices in compliance with statutory legislation in force in your country.
Never carry out dismantling procedures single-handedly. Always make sure there is someone there to provide assistance and/or help in the event of accidents. Said assistant must have the professional training of a maintenance technician or higher.

Pay attention to any decals affixed to the components to be disconnected and next to terminal boxes.
When the machine has been fully dismantled all the machine's identification plates and accompanying documents must be destroyed.

9.2. DISPOSAL

DANGER - WARNING
DISPOSE OF THE COMPONENTS WHICH MAKE UP THE MACHINE IN ACCORDANCE WITH OPERATING METHODS WHICH OBSERVE THE MAIN REGULATIONS GOVERNING SAFETY AND ENVIRONMENTAL PROTECTION.

The machine can be disposed of without having to reduce it to small pieces; simply separate the main units it is made up of and load them onto a lorry for transfer to a scrap merchant.

Clearly, this operation must be performed using adequate lifting and handling equipment including forklifts, hoists, A-frames, overhead travelling cranes, etc., all of which must be approved and certified in compliance with statutory legislation and applicable regulations.

Proceed with disposal operations in accordance with the relative legislation in force, by contacting the relative bodies and/or specialized waste disposal companies authorized to handle industrial machinery and/or waste disposal, to make sure that all plastics, metal materials and components which must be disposed of separately are duly sorted.

The employer must be aware of all the statutory legislation in force in the country of disposal and must operate in compliance with the relative provisions.

Abandoning the machine in the environment is prohibited. Violators may face prosecution.

IDENTIFICATION DATA

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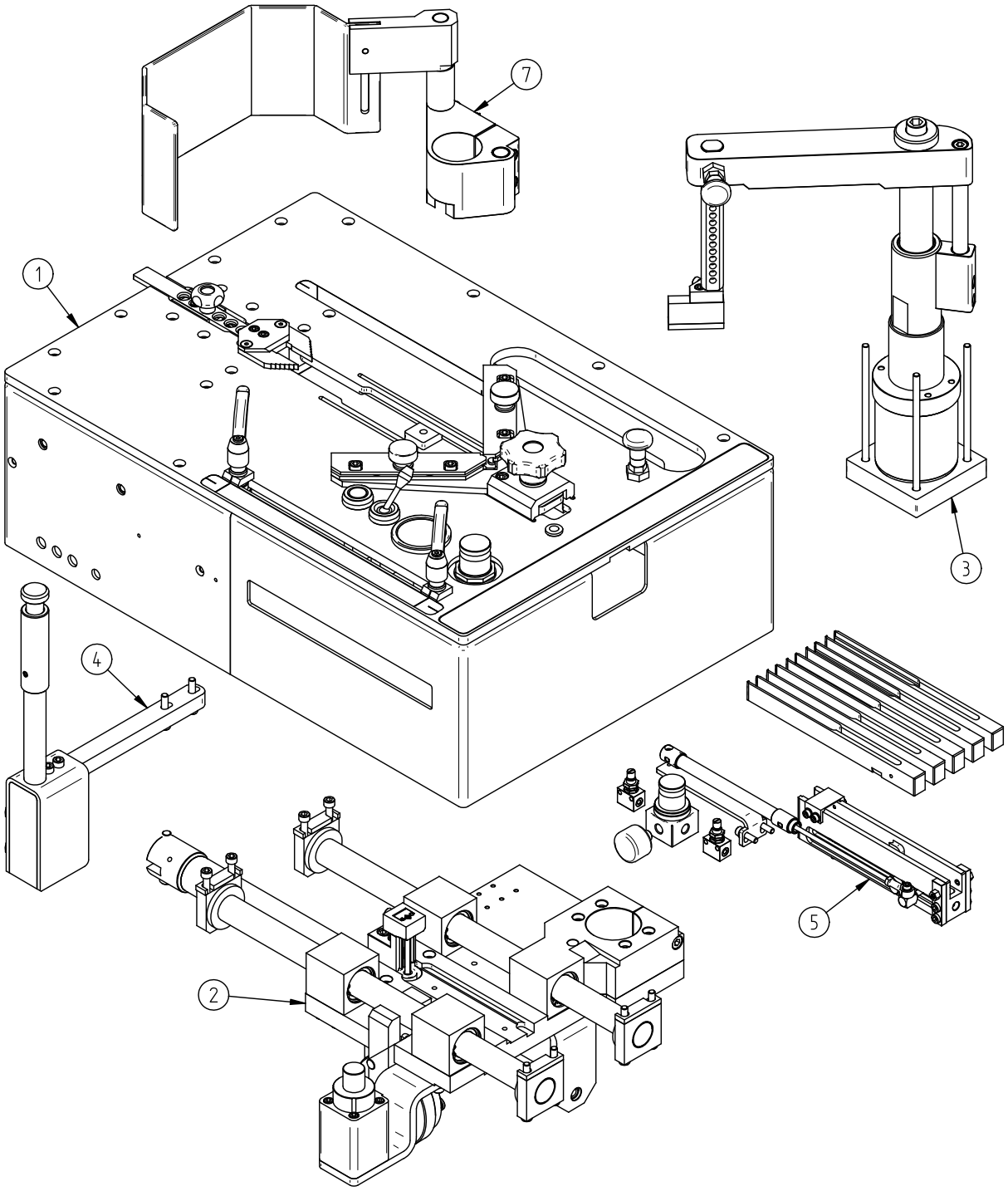
Name	**FRAME ASSEMBLING MACHINE**
Function	**ASSEMBLY OF FRAMES BY INSERTION OF METAL V-NAILS**
Model / Type	**Minigraf - 144**
Serial number	
Year of construction	**2011**
Manual Revision	**01**

DOCUMENT

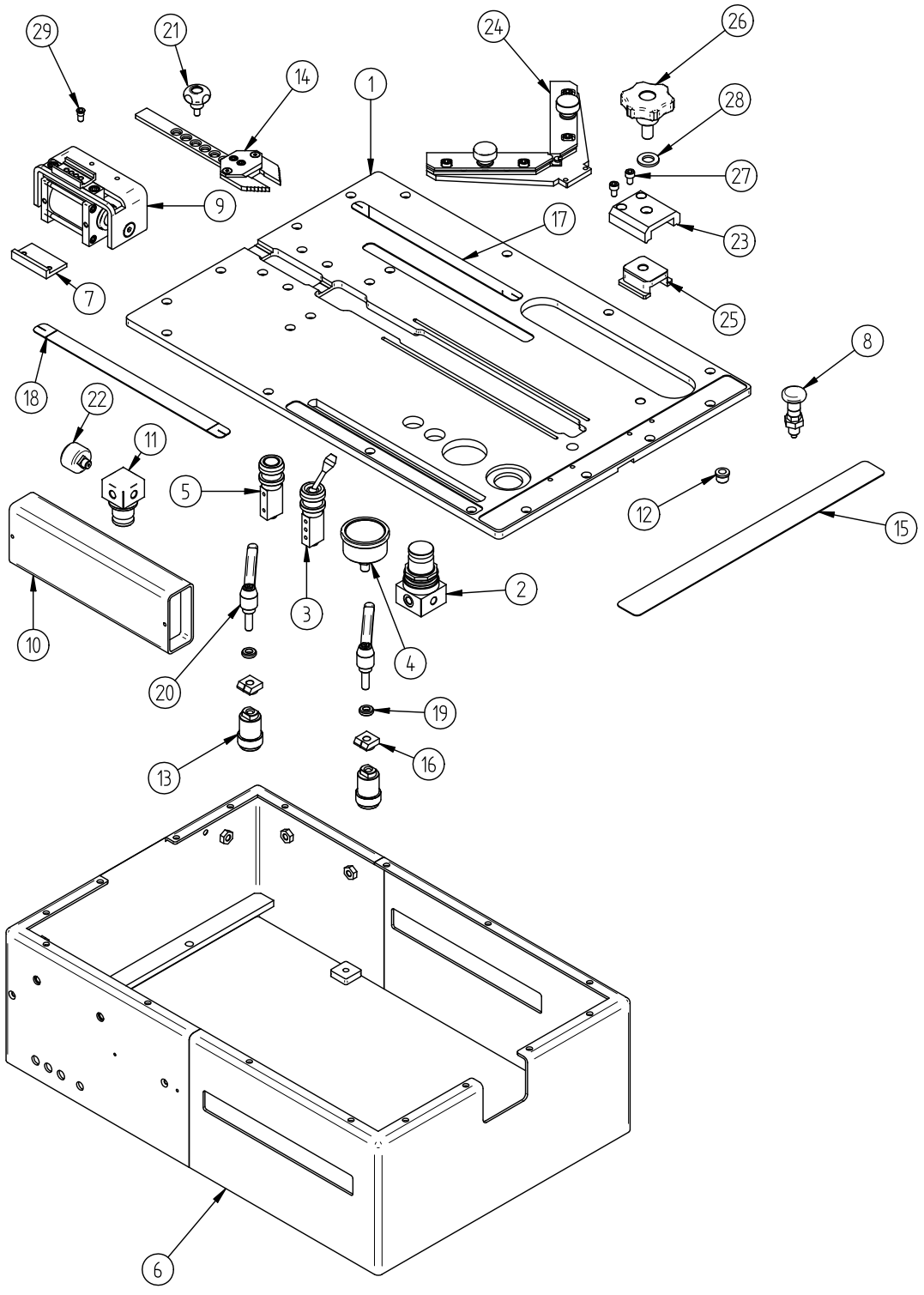
INSTRUCTION MANUAL
No. of volumes: 1
Date: 15/05/2013

Revision: 00



POS.	CODE	DESCRIPTION
1	TABLE 1	WORKING BENCH ASSEMBLY
2	TABLE 2	SLIDE ASSEMBLY
3	TABLE 3	VERTICAL CLAMP ASSEMBLY
4	TABLE 5	MAGAZINE ASSEMBLY
6	TABLE 7	EC SAFEGUARD ASSEMBLY

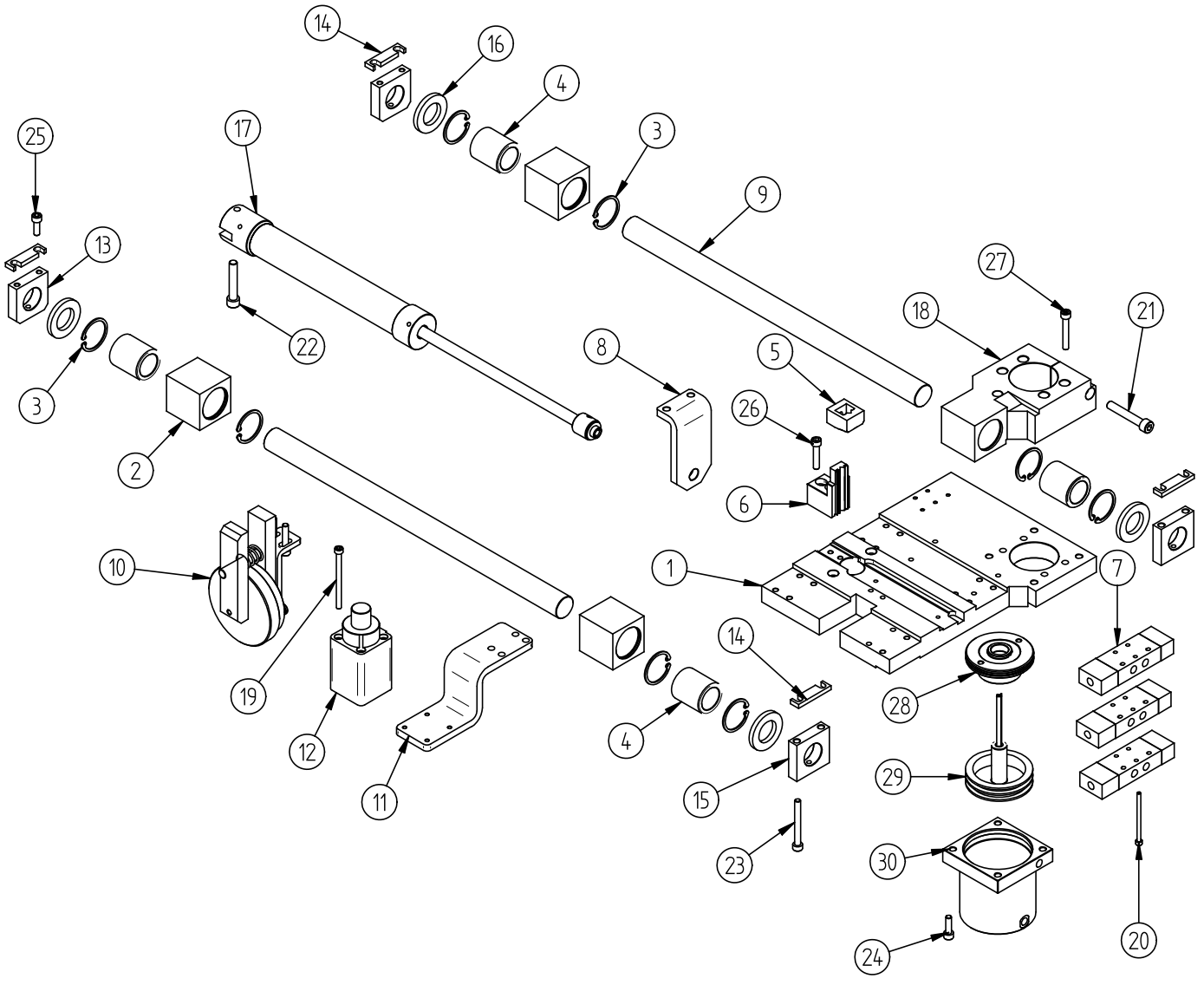
TABLE 1 - WORKING BENCH ASSEMBLY



POS.	CODE	DESCRIPTION
1	M30100001	WORK SURFACE M144
2	735630006	MICRO-REGULATOR BIT 1/8
3	732140001	VALVE 0ALF M5 PLV
4	734230004	PRESSURE GAUGE 0-10 BAR 1/8
5	732140005	BUTTON VALVE
6	M29000004	CASING M144
7	384200020	HORIZONTAL LOCKING DEVICE SUPPORT
8	753320012	STOP KNOB
9	M29100012	HORIZONTAL LOCKING DEVICE M144
10	240450044	RESERVOIR
11	735630004	MICRO-REGULATOR 0-4 1/8
12	365010130	NYLON PLUG D.13
13	M29100011	STOPPER
14	M29000015	FRONT CLAMP
15	365210335	INSTRUMENT PANEL PLATE
16	M30100048	POINTER
17	366710106	FENCE RULER MM-INCH
18	366710105	RULER MM-INCH

POS.	CODE	DESCRIPTION
19	336100070	POINTER WASHER
20	753170008	HANDLE M8x25
21	753320001	GRIP KNOB M6x12
22	734230002	PRESSURE GAUGE 0-4 BAR 1/8
23	M30100009	FENCE SUPPORT
24	M29100004	2-KNOB FENCE UNIT
25	M30100010	FENCE LOCKING SLIDE
26	M30100080	GRIP KNOB M12x22
27	710100072	HEX. SOCKET CYLINDRICAL HEAD SCREW M6 X 10
28	718100006	WASHER M12
29	366210030	FRONT CLAMP ACTIVATION SCREW

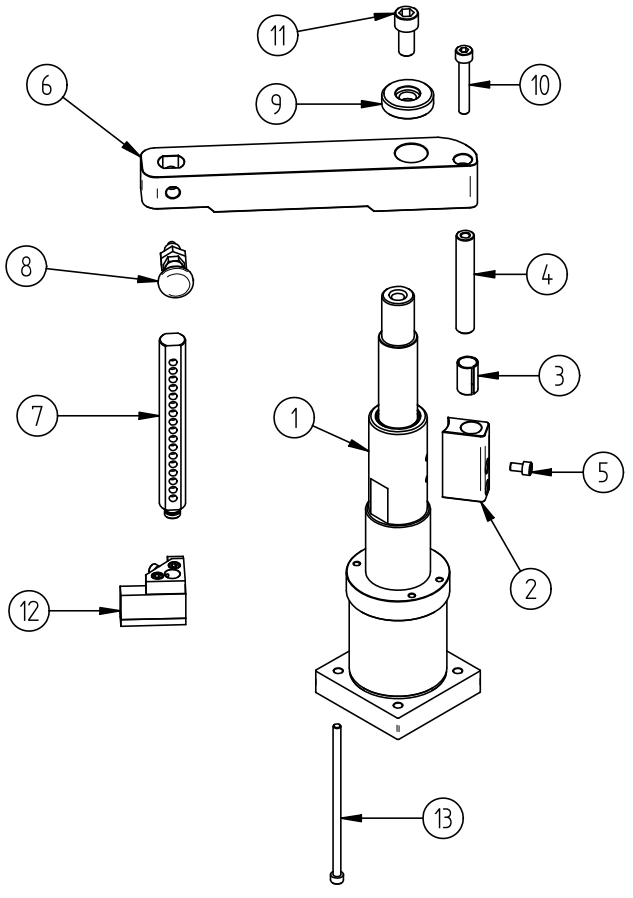
TABLE 2 - SLIDE ASSEMBLY



POS.	CODE	DESCRIPTION
1	M30100004	SLIDE PLATE
2	M30100006	ROD SLEEVE
3	705050024	CIRCLIP I35
4	740550084	SLEEVE KH2540
5	394950570	MC HEAD
6	M30100011	L-SHAPED SUPPORT
7	732440003	VALVE
8	M30100039	BALANCING CYLINDER SUPPORT.
9	334000490	MC ROD
10	M22000004	BRAKE UNIT
11	M30000009	STOPPER CYLINDER SUPPORT.
12	753750017	STOPPER CYLINDER
13	M30100002	FRONT ROD BLOCK
14	M30100003	BLOCK SPACER
15	M30100005	REAR ROD BLOCK
16	M30100012	STOP RING
17	M29100008	BALANCING CYLINDER
18	M30100076	ROD SUPPORT

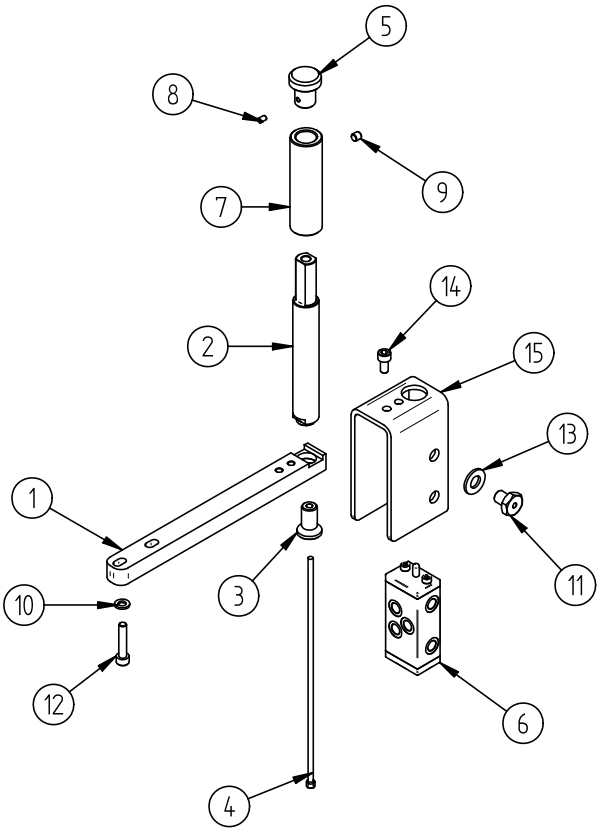
POS.	CODE	DESCRIPTION
19	710100061	HEX. SOCKET CYLINDRICAL HEAD SCREW M5 X 70
20	710100015	HEX. SOCKET CYLINDRICAL HEAD SCREW M4 X 60
21	710100120	HEX. SOCKET CYLINDRICAL HEAD SCREW M8 X 50
22	710100119	HEX. SOCKET CYLINDRICAL HEAD SCREW M8 X 45
23	710100147	HEX. SOCKET CYLINDRICAL HEAD SCREW M6 X 55
24	710100093	HEX. SOCKET CYLINDRICAL HEAD SCREW M6 X 20
25	710100076	HEX. SOCKET CYLINDRICAL HEAD SCREW M6 X 18
26	710100080	HEX. SOCKET CYLINDRICAL HEAD SCREW M6 X 30
27	710100082	HEX. SOCKET CYLINDRICAL HEAD SCREW M6 X 40
28	352400010	CYLINDER HEAD
29	M29100022	COMPLETE HAMMER
30	352200260	CUP

TABLE 3 - VERTICAL CLAMP ASSEMBLY



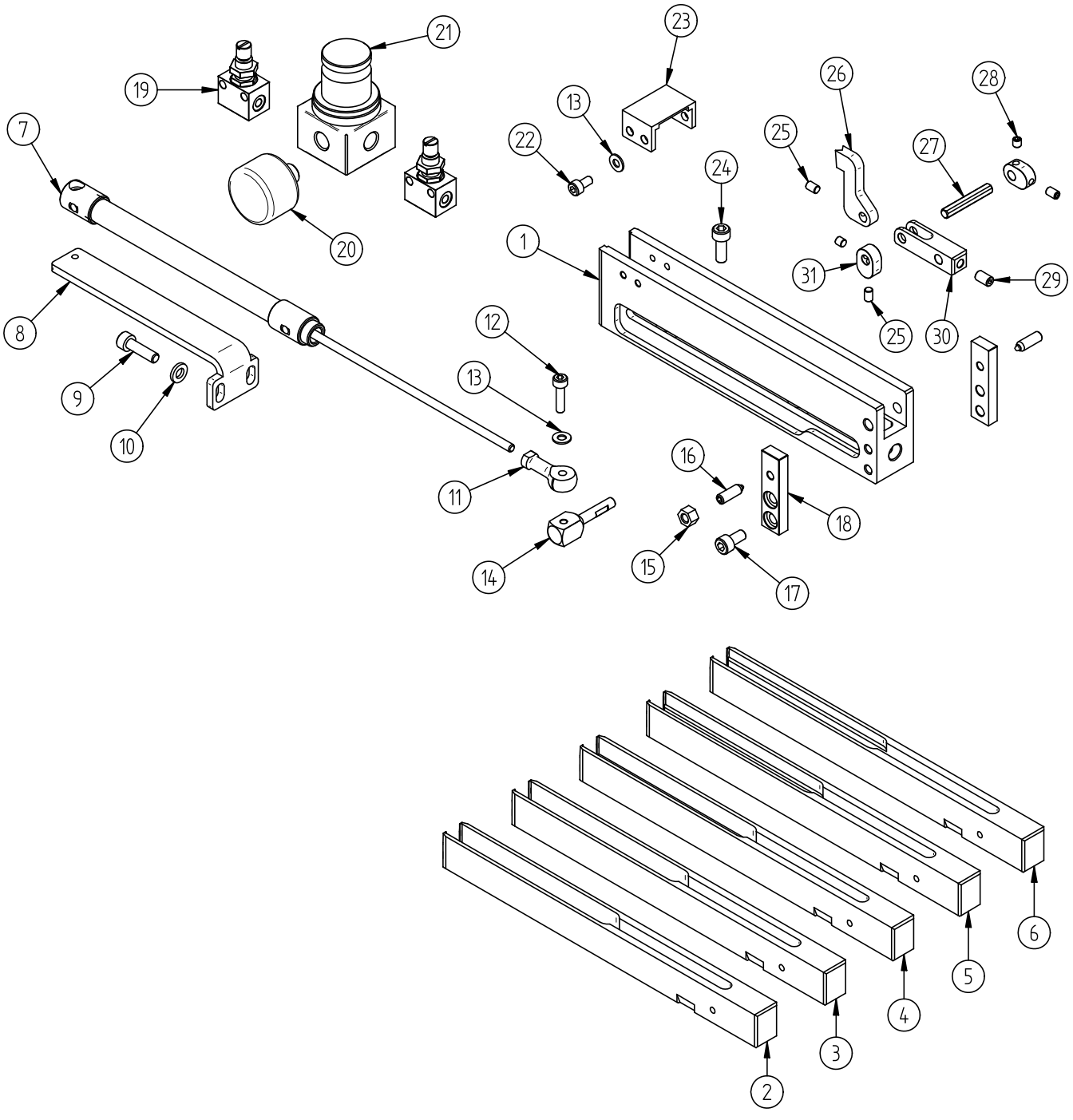
POS.	CODE	DESCRIPTION
1	M22100002	COMPLETE COLUMN
2	M30100038	ARM STOPPER
3	753420016	BUSH D14 L25
4	M30100044	ARM ANTI-ROTATION PIN
5	710100072	HEX. SOCKET CYLINDRICAL HEAD SCREW M6 X 10
6	M30100018	ARM
7	334000100	VERTICAL CLAMP ROD
8	753320010	LOCKING KNOB
9	336100120	STOP WASHER
10	710100120	HEX. SOCKET CYLINDRICAL HEAD SCREW M8 X 50
11	710100190	HEX. SOCKET CYLINDRICAL HEAD SCREW M12 X 25
12	242230050	COMPLETE ANGLE PRESSURE PLATE
13	710100067	HEX. SOCKET CYLINDRICAL HEAD SCREW M6 X 140

TABLE 4 - CONTROL LEVER ASSEMBLY



POS.	CODE	DESCRIPTION
1	M30100017	SLIDE MOVING LEVER
2	M30100051	LEVER PIN
3	366210020	LEVER PIN FIXING SCREW
4	331500060	COMPLETE BUTTON ROD
5	363710020	BUTTON
6	732290001	BUTTON VALVE
7	336500090	BUTTON BUSH
8	714300063	GRUB SCREW M4x6
9	714300015	GRUB SCREW M6x6
10	718100003	WASHER M6
11	M30100053	VALVE SUPPORT SCREW
12	710100080	HEX. SOCKET CYLINDRICAL HEAD SCREW M6 X 30
13	718100005	WASHER M10
14	710100073	HEX. SOCKET CYLINDRICAL HEAD SCREW M6 X 12
15	M29000005	VALVE SUPPORT GUARD

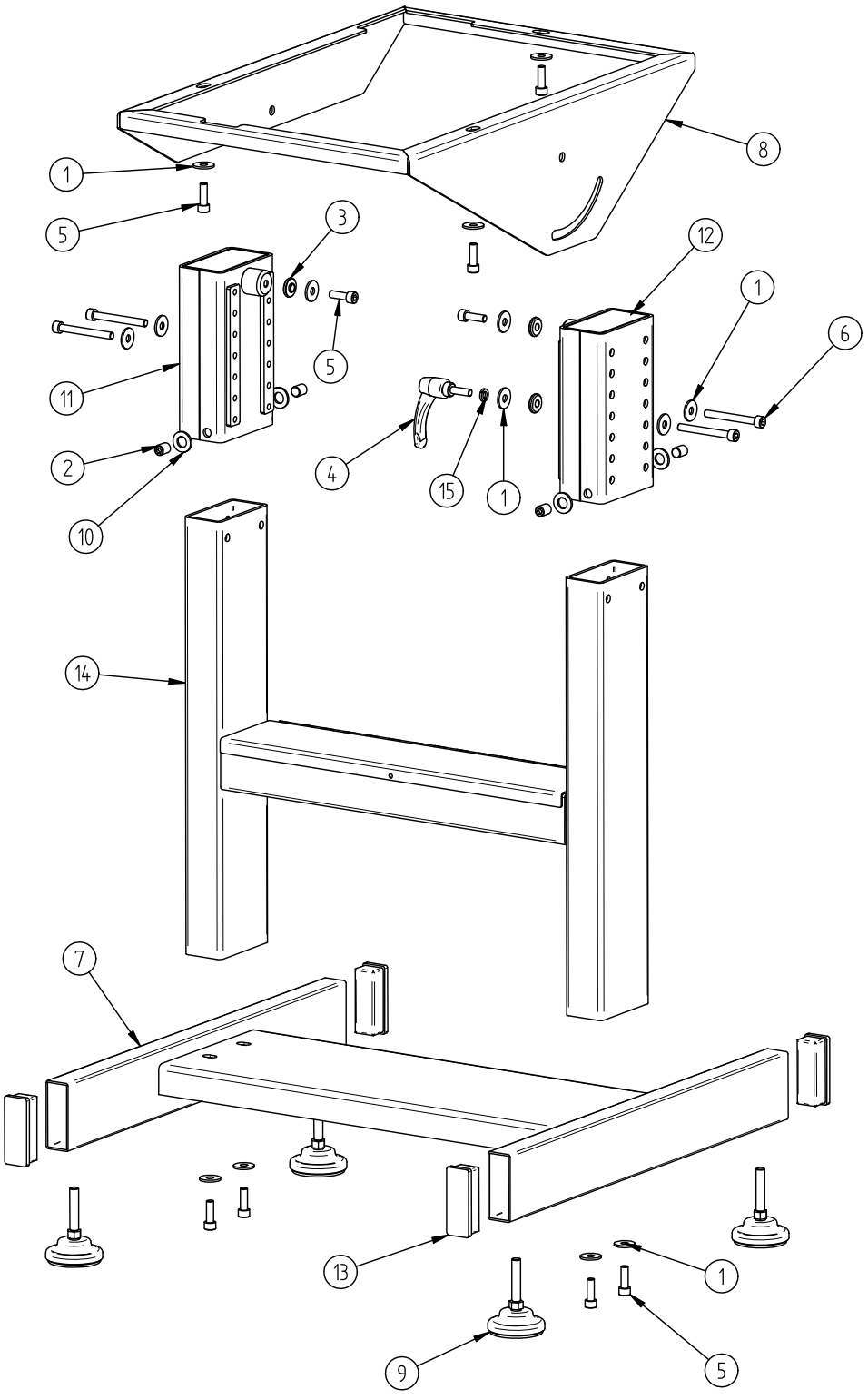
TABLE 5 - MAGAZINE ASSEMBLY



POS.	CODE	DESCRIPTION
1	M30100054	MAGAZINE
2	M30100055	CARTRIDGE H15
3	M30100056	CARTRIDGE H12
4	M30100057	CARTRIDGE H10
5	M30100058	CARTRIDGE H7
6	M30100059	CARTRIDGE H5
7	M29100020	V-NAIL PUSHER CYLINDER
8	M30000003	V-NAIL PUSHER CYLINDER SUPPORT
9	710100046	HEX. SOCKET CYLINDRICAL HEAD SCREW M5 X 18
10	718100002	WASHER M5
11	753320014	ARTICULATED HEAD RF4
12	710100006	HEX. SOCKET CYLINDRICAL HEAD SCREW M4 X 16
13	718100001	WASHER M4
14	M30100065	MOVEMENT PIN
15	715650002	NUT M5
16	753320013	PRESSER M5
17	710100042	HEX. SOCKET CYLINDRICAL HEAD SCREW M5 X 10
18	M30100070	PRESSER SUPPORT

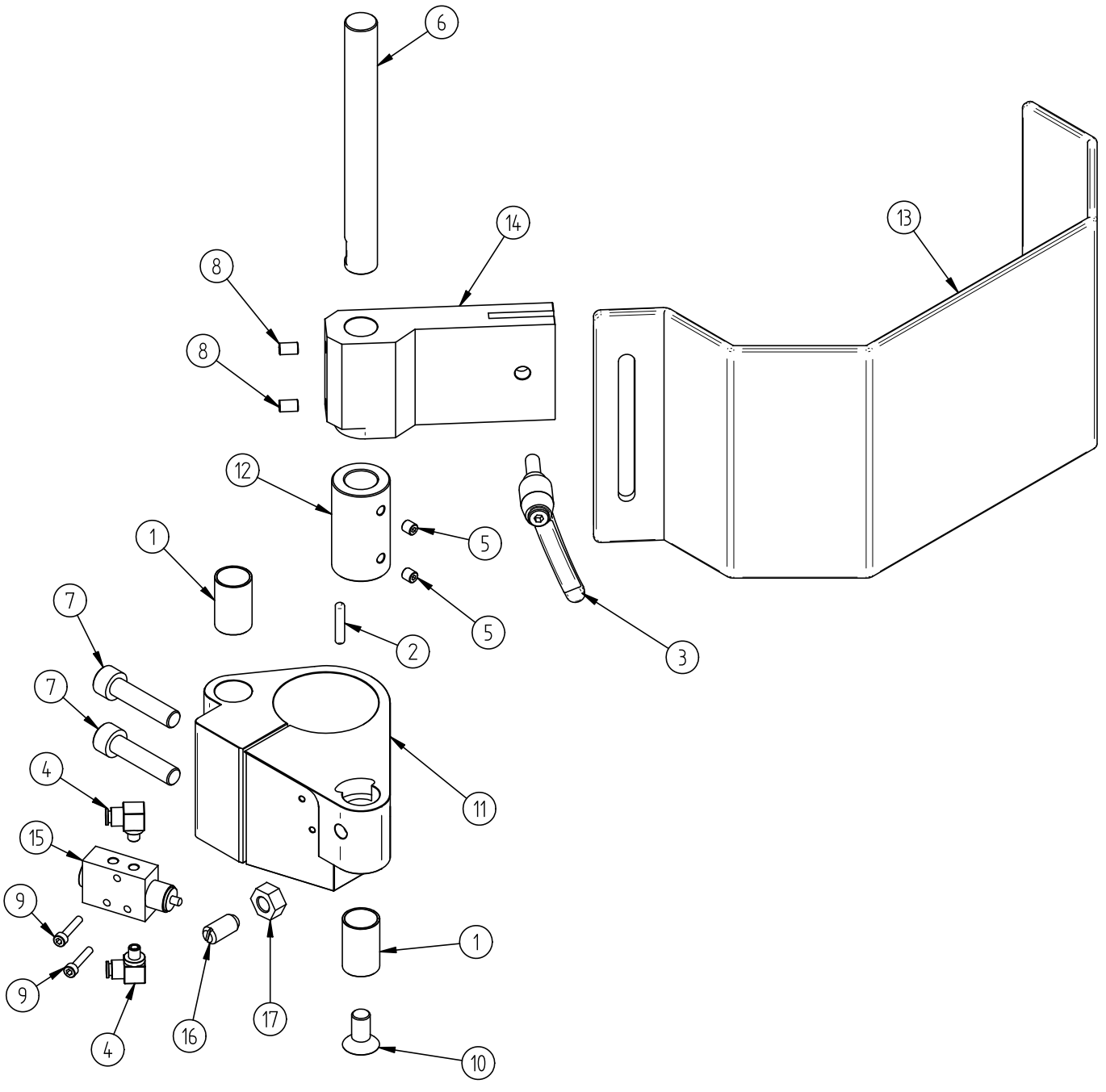
POS.	CODE	DESCRIPTION
19	732630003	FLOW REGULATOR
20	734230002	PRESSURE GAUGE 0-4 BAR 1/8
21	735630004	MICRO-REGULATOR 0-4 1/8
22	710100002	HEX. SOCKET CYLINDRICAL HEAD SCREW M4 X 10
23	M30100082	MAGAZINE ENTRANCE
24	710100044	HEX. SOCKET CYLINDRICAL HEAD SCREW M5 X 10
25	714300063	GRUB SCREW M4x6
26	M30100066	V-NAIL PUSHER TOOTH
27	M30100079	SLIDE PIN
28	714300003	GRUB SCREW M4x4
29	714300073	GRUB SCREW M5x8
30	M30100062	V-NAIL PUSHER SLIDE
31	M30100078	TOOTH ROTATION CAM

TABLE 6 - SUPPORT STAND



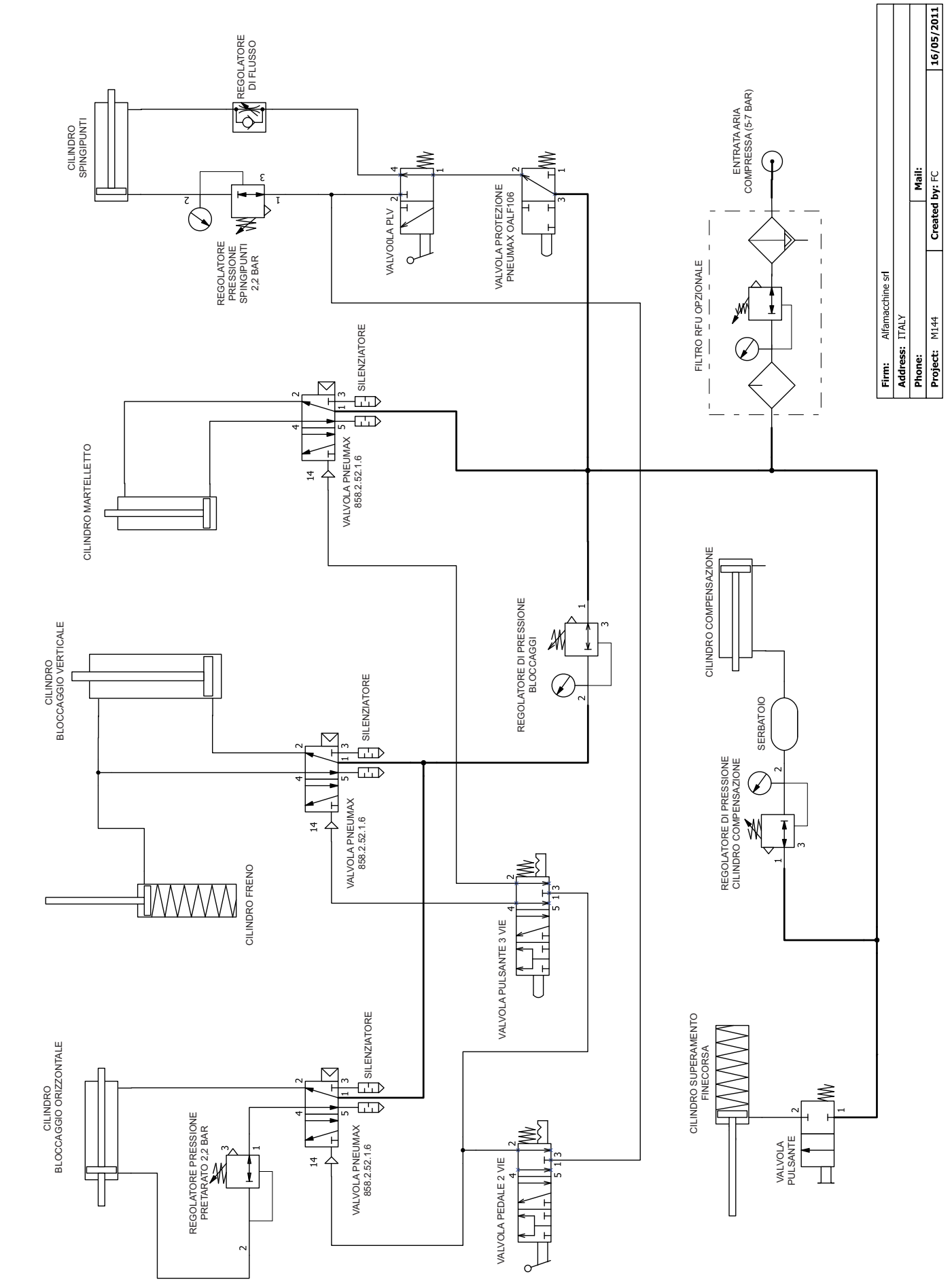
POS.	CODE	DESCRIPTION
1	718100016	WASHER 8x24
2	714300042	GRUB SCREW M12x1,25x16
3	336100060	SPACER WASHER
4	753170014	HANDLE M8x25
5	710100115	HEX. SOCKET CYLINDRICAL HEAD SCREW M8 X 25
6	710100122	HEX. SOCKET CYLINDRICAL HEAD SCREW M8 X 70
7	M29000007	SUPPORT STAND BASE
8	M29000006	SUPPORT STAND CRADLE
9	753690020	ADJUSTABLE FOOT M10 X 50
10	718100006	WASHER M12
11	M29000010	LEFT SUPPORT STAND SECTION
12	M29000011	RIGHT SUPPORT STAND SECTION
13	810380430	PLUG 80x30
14	M29000012	SUPPORT STAND UPRIGHT
15	718450005	LOCK WASHER M8

TABLE 7 - EC SAFEGUARD ASSEMBLY



POS.	CODE	DESCRIPTION
1	753420016	BUSH Di14 L25
2	753870011	PIN D4x20
3	753170009	HANDLE M8x25
4	730160002	CONNECTOR M5 PIPE 4
5	714300008	GRUB SCREW M5x5
6	M30100087	SAFETY PIN
7	710100117	HEX. SOCKET CYLINDRICAL HEAD SCREW M8 X 35
8	714300073	GRUB SCREW M5X8
9	710100203	HEX. SOCKET CYLINDRICAL HEAD SCREW M3 X 16
10	710200081	FLAT CTSK. HEX HEAD SCREW M8 X 16
11	M30100086	GUARD SUPPORT
12	M30100085	GUARD SPACER
13	M30100084	EC SAFEGUARD
14	381300260	GUARD SUPPORT
15	732540003	MICRO-VALVE
16	714300056	BALL GRUB SCREW M8
17	715650004	NUT M8

PNEUMATIC DIAGRAM



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