Alfamacchine
A Fletcher Company

Instruction, Use and Maintenance Manual

Integrated cutting system
T400evo

CE

TRANSLATION OF THE ORIGINAL INSTRUCTIONS

(Keep for future reference)

ENGLISH

ALFAMACCHINE S.r.l.
Via Marie Curie e Pierre, 3 - 47122 Forlì - FC -
Tel. +39-0543/783301 Fax +39-0543/783302
http://www.alfamacchine.com

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MANUFACTURER	ALFAMACCHINE S.r.l.
ADDRESS	Street: Via Marie e Pierre Curie, 3 Postal code: 47122 Forlì - Italy Tel.: +39 +39 0543 783301 Web: www.fletcher-terry.com E-mail: customerservice@alfamacchine.com
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DOCUMENT CODE	IU_T400evo_rev0_EN
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PRODUCT	Integrated cutting system
MODEL:	(See the CE data plate affixed to the machine)
SERIAL NUMBER	(See the CE data plate affixed to the machine)
YEAR OF MANUFACTURE	(See the CE data plate affixed to the machine)
CONFORMITY	CE

Contents

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1 WARNINGS AND GENERAL INFORMATION

CONTENTS

1.1. GENERAL AND SAFETY WARNINGS

Important warnings

To safeguard people, animals, property, machine operators and technicians and to avoid damaging the equipment itself, it is essential to read and understand this Instruction, Use and Maintenance Manual in full before carrying out any work on or with the machine.

Symbols used in this manual

The following symbols are used in this manual to highlight particularly important indications and warnings:

WARNING:
This symbol indicates accident prevention regulations for operators and/or any exposed persons.

CAUTION:
This symbol indicates a risk of damaging the equipment and/or its components.

NOTE:
This symbol indicates useful information.

This symbol indicates instructions addressed exclusively to the manufacturer's technicians or expert operators/technicians authorized by the manufacturer.

cont. ...

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Intended readers of this Instruction, Use and Maintenance Manual

This document is aimed at personnel who, through experience or qualification, are able to operate in compliance with the necessary safety regulations.
The professional figures for whom this document is intended are:

- Authorized operators
- Maintenance technicians
- Machinery dismantling workers

WARNING
These instructions are intended for professional operators with the necessary skills to use the machine in all of its phases
The person in charge must make sure that all operators have the necessary skills and training to perform their tasks.

Limitation of liability

WARNING
Any technical alterations that affect the functioning and/or safety of the machine must be carried out solely and exclusively by technical personnel duly authorized by ALFAMACCHINE S.r.l..
Any work on the machine performed without due authorization from ALFAMACCHINE S.r.l. shall be considered "tampering" and result in the warranty becoming null and void, exonerating the manufacturer, ALFAMACCHINE S.r.l., from all liability for any injury to people and animals or damage to property and the equipment itself caused by incorrect use of the machine.

1.2. How to consult this manual

How this Instruction, Use and Maintenance Manual is structured

This manual is divided into chapters which group together all the information needed to use the machine in total safety.
Each chapter is subdivided into headings which focus on essential points and each heading may be subdivided into further topics under a subtitle with a description.

The beginning of each chapter starts on a right-hand page indicating the chapter number and title.

Consequently, taking chapter 1 as an example, the layout is as follows:

1 Chapter title
1.1 Heading.
1.1.1 Sub-heading
1.1.1.1 Any further sub-heading levels

Taking care of this manual

This manual must be kept intact and legible in all its parts. The end user and specialized authorized maintenance technicians must be able to consult it at any time.

Copyright

Page, figure and table numbering

The numbering of pages, figures and tables is reset at the beginning of each chapter, consequently there will be a first digit indicating the chapter and then the sequential number of the page (plus total number of pages), the figure or the table starting from the number 1 at the beginning of each chapter.

1.3. DECLARATION CE OF CONFORMITY (FACSIMILE)

Alfamacchine
A Fletcher Company

Alfamacchine S.r.l.
Via Marie Curie e Pierre, 3 47122 Forlì - Italy

(Annex II A_Directive 2006/42/EC)

The undersigned

ALFAMACCHINE S.r.l.
Via Marie e Pierre Curie, 3 - 47122 Forlì (FC) - Italy
Tel. (+39) 0543 783301
www.fletcher-terry.com - customerservice@alfamacchine.com

DECLARES UPON ITS SOLE RESPONSIBILITY THAT THE NEW MACHINE:

Name: Integrated cutting system
Model: ……..……...…..
Serial number: ……..……..……..

Intended use / function:
This machine is a pneumatic-powered machine designed and built to precisely cut 45-degree bevel cuts for frames and woodworking applications such as windows, doors and furniture components.

COMPLIES WITH THE LEGISLATIVE PROVISIONS THAT TRANSPOSE THE FOLLOWING DIRECTIVES:

- Directive 2006/42/CE OF THE EUROPEAN PARLIAMENT and OF THE COUNCIL of 17 May 2006 relating to machinery and amending Directive 95/16/CE (recast)
- Electromagnetic Compatibility (EMC) Directive 2014/30/EU

MAIN REFERENCE TECHNICAL STANDARDS:

EN ISO 12100 (2010) - UNI EN 1870-16:2012

The person authorized to compile the technical file and draw up this declaration is:

First name: ……..

Last name: ……..

Address: ……..

Position: Managing Director:

date and place ..... signature .....

1.4. IDENTIFICATION DATA PLATE CE

Characteristics of the identification data plate
CE

This machine was produced in a European Community member state and therefore complies with the safety requirements set out in Machinery Directive 2006/42/EC.
Figure 1-1 shows the relative CE identification data plate and its position on the machine.
The CE data plate indicates the machine's identification data which must be cited when contacting the manufacturer, ALFAMACCHINE S.r.l..

NOTE
Make sure that the machine data provided on the cover of this manual matches the data on the CE identification data plate and in the machine's technical specifications.
Furthermore, it is strictly forbidden to damage or remove the CE identification data plate.

Key to figure 1-1:

1. Company name
2. Machine type
3. Machine model
4. Serial number
5. Weight of the machine
6. Year of manufacture
7. CE marking

Figure 1 - 10

1.5. NORMATIVE REFERENCES

Legal regulations

Reference	Title
Legislative Decree no. 17 of 27.1.2010	Implementation of Directive 2006/42/EC, relating to machinery and amending Directive 95/16/EC relating to lifts.
Legislative Decree no. 81 of 9.04.2008	Implementation of article 1 of Law no. 123 of 3 August 2007 on the protection of health and safety in the workplace.

EC standards

Reference	Title
EC Directive no. 2006/42	Machine Safety Directive (since 29 December 2009)

1.6. PERSONNEL REQUIREMENTS

General requirements

This manual identifies the following professional figures:
- Handlers
- Hauliers
- Installers
- Authorized operators
- Maintenance technicians
- Machinery dismantling workers

All the figures indicated above must possess the specific professional requirements for each envisaged operation. They must be trained and consequently have an understanding of the tasks assigned to them as part of their job.

Handler requirements

Qualified personnel, capable of unpacking the product in compliance with the relative instructions.
When necessary, able to place the product in appropriate packaging, checking its correct position in relation to the packaging, and adequately closing it.
Must be able to carry out these operations (with the aid of lifting gear if necessary) in conditions of safety for people, the product and the environment.

Haulier requirements

Qualified personnel, capable of placing the packaged product on a means of transport (with the aid of lifting and containment devices if necessary), stowing and positioning it in a suitable manner, transporting the product to its destination and unloading it from the means of transport, all the above in conditions of safety for people, the product and the environment.

Installer requirements

Qualified personnel, capable of positioning, as explicitly or implicitly delegated by the purchaser and in collaboration with the seller, the product in safe operating conditions for people, the product and the environment, providing the user / operator with all the fundamental information on the safe use and maintenance of the product.

cont. ...

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Machine operator requirements	Qualified personnel, capable of carrying out the following tasks: ● machine operation and supervision using the systems and controls provided; ● standard adjustment, start-up and format changeover operations and reset following a forced stop.
Expert maintenance mechanic	Qualified technician capable of operating the machine in normal conditions and with the safeguards disabled and of working on the mechanical and pneumatic parts to carry out all the necessary adjustments, maintenance and repairs.
Machinery dismantling worker requirements	Qualified personnel, capable of recognizing when it is time to demolish the product and dismantle it into its constituent parts, separating by type the relative materials, disposing of all non-reusable parts in a safe and environmentally-friendly manner while sending the rest away for recycling.

1.7. REQUESTING SPARE PARTS AND ASSISTANCE

Contacting the service centre

When contacting the service centre, always provide the following information:

- machine model and type
- serial number
- year of manufacture;
- when possible specify the nature of the problem encountered or the defect affecting the machine e.g.: electrical, mechanical or in terms of quality of work.

Technical assistance office

Our main technical assistance office can be found at the following address:

ALFAMACCHINE S.r.l.
Via Marie e Pierre Curie, 3
47122 Forlì - Italy
Tel. (+39) 0543 783301

service@alfamacchine.com
customerservice@alfamacchine.com
www.fletcher-terry.com

1.8. WARRANTY

Warranty terms and conditions

- The manufacturer's warranty covers the machine and its components for 1 year from the date of invoicing.
- The warranty refers to the free replacement of mechanical parts found to be defective at source and recognized as such by the manufacturer.
- The manufacturer reserves the right to decide whether to replace or repair mechanical parts recognized as defective.

Exclusions

The warranty does not cover:

- mechanical components and parts subject to wear during operation (e.g. punch - die, pneumatic components)
- labour for troubleshooting
- labour for repairing and/or replacing defective parts
- transport, travel and/or accommodation expenses
- No liability or exception shall be charged to the manufacturer for machine downtime and/or lack of production.

Warranty forfeiture

The warranty shall immediately be null and void in the event of:

- improper use of the machine.
- failure to comply with the instructions and recommendations set out in this Instruction, Use and Maintenance Manual.
- use of the machine by unsuitable and untrained personnel, or by personnel who have not read and understood the contents of this Instruction, Use and Maintenance Manual.
- alterations, even of minor entity, carried out on the machine and/or on the electrical and pneumatic equipment, or the software, etc., without prior written authorization from the manufacturer.
- use of spare parts that are not genuine and are not supplied by the manufacturer.
- use of hardware not produced by ALFAMACCHINE S.r.l. .
- storage and use in an unsuitable location.
- tampering with safety devices.
- exceptional events.

1.9. MACHINE ACCEPTANCE TESTING SHEET (FACSIMILE)

Introduction

The machine acceptance testing sheet, supplied as an appendix to this manual, an example of which is provided below, is filled out by the manufacturer, dated and signed before the machine is placed on the market. It serves to verify that the main components on the machine have been installed correctly and are in perfect working order.

MACHINE ACCEPTANCE TESTING SHEET			
CODE:	**MODEL:**	**SERIAL NUMBER:**	**RESULT**
PNEUMATIC SYSTEM COMPONENT SEAL CHECK			
CHECKING ELECTRICAL SYSTEM COMPONENTS			
CHECKING SAFEGUARDS AND SCREWS TIGHTNESS			
CHECKING CUTTING ANGLES			
CHECKING BLADE VERTICALITY			
CHECKING BLADE UNIT MOVEMENTS			
CHECKING CUT QUALITY AN[illegible]INISH			
CHECKING CUTTING [illegible]PACI[illegible]PLIANCE			
CHECKING TH[illegible]OBI[illegible]OF CARRIAGE MOVEMENTS			
CHECKING [illegible] REPEATABILITY AND ACCURACY OF THE MOBILE STOP DIMENSIONS			
CHECKING CALIBRATIONS AND PARAMETERS			
CHECKING EFFICIENCY OF SAFETY SYSTEMS			

DATE: ..... / ..... /	OPERATOR: .....……

2 MACHINE OVERVIEW AND TECHNICAL DATA

CONTENTS

2.1. MACHINE OVERVIEW

Functional and construction features

The T400evo machine is designed to precisely cut mouldings at a 45-degree angle for frames and woodworking applications such as windows, doors and furniture components.

The machine consists of a steel support structure, equipped with adjustable support feet, which supports and contains the units and equipment that make it up.

The general electrical cabinet, which contains all the wiring, is integrated into the machine.

Intended use

The T400evo machine is designed for professional use and medium to high-speed production, for precision cutting of mouldings with 45-degree bevel cuts, for frames and woodworking applications such as windows, doors and furniture components, in accordance with the specifications set out in section 2.3.1 ‘Technical Data’.

2.2. MACHINE COMPOSITION - MAIN UNITS

Introduction

The main machine units are:

Pos.	Description	Pos.	Description
1	Frame supporting arm.	9	Mobile stop unit.
2	Frame width measuring unit.	10	Mobile stop unit motor drive.
3	Control panel.	11	Power panel.
4	Pneumatic system in position.	12	Pneumatic foot control for operating workpiece clamping systems.
5	Cutting unit.	13	Buttons for lowering and activating the cutting blades.
6	Pushbutton panel on the machine.	14	Pneumatic system in position.
7	Command and control panel.	15	Work surface
8	Barcode reader (optional).	16	Air treatment unit.

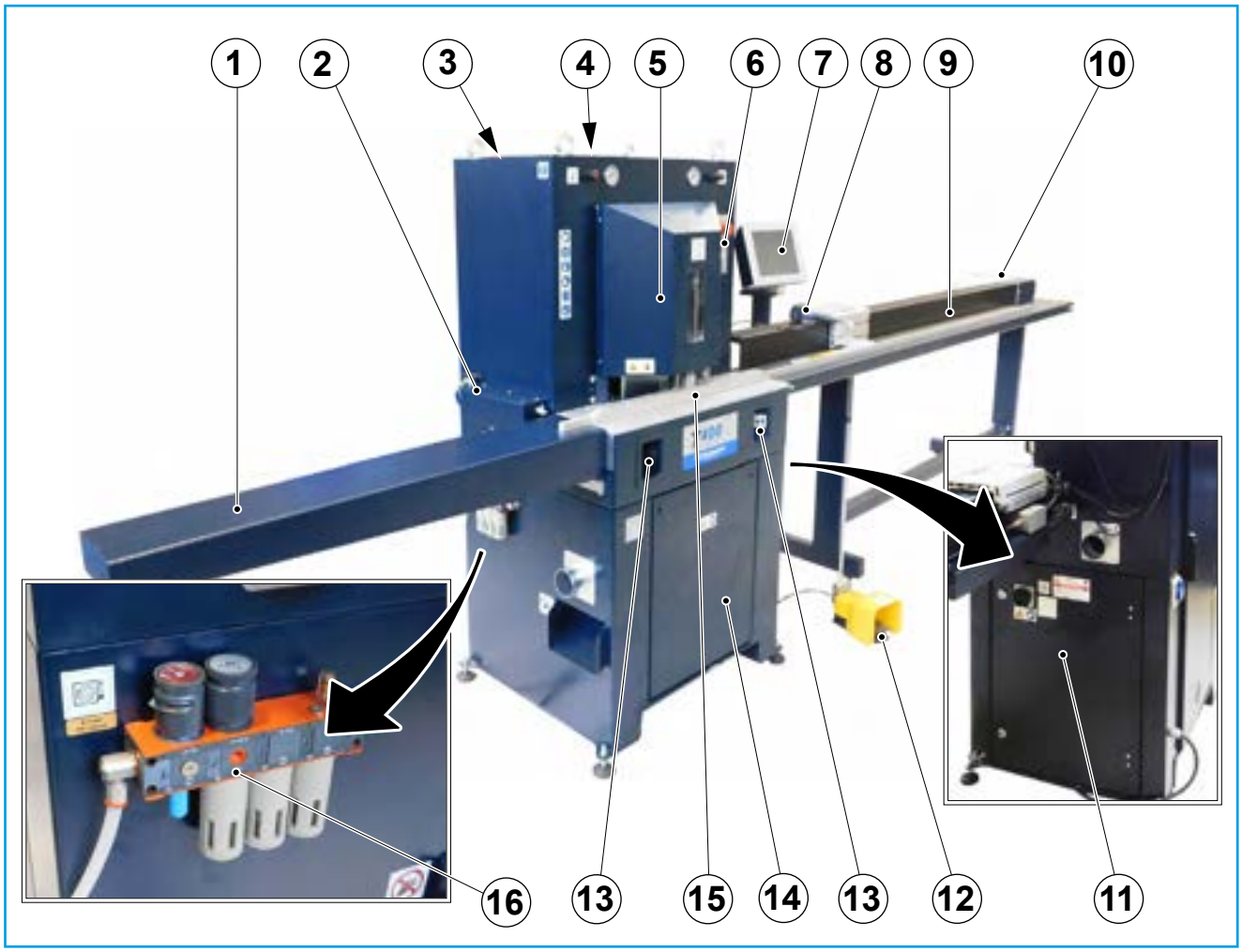

Figure 2 - 5

2.3. DESCRIPTION OF THE MAIN GROUPS

2.3.1. Cutting unit

Functional characteristics

This unit consists of the left blade (1), which rotates clockwise, and the right blade (2), which rotates counter-clockwise.
The vertical clamping system consists of five stoppers on each side, left (3) and right (4).
The horizontal clamping systems (5) and (6) are operated by their respective cylinders (7) and (8) located at the rear inside the machine compartment.

Both workpiece clamping systems are electronically adjustable according to production requirements.

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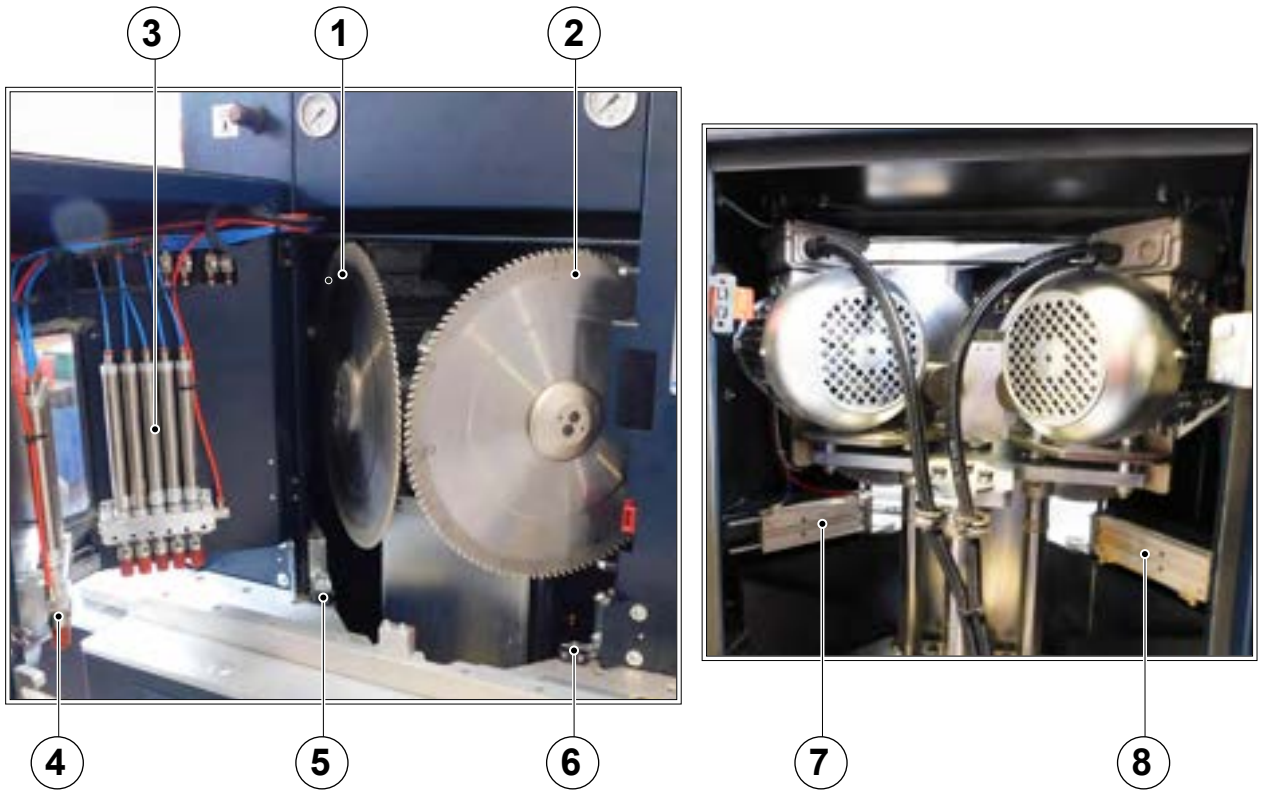

Figure 2 - 6

cont. ...

Functional characteristics

During operation, the blades, which are rotated by their respective motors (9) and (10), move vertically thanks to the action of the pneumatic cylinder (11) and the guide columns (12), with a cutting angle of 45° downwards, and then return to their initial position when the cut is complete; the sensor (13) determines and controls the end-of-cut position of the blades, upon reaching which it commands their automatic lifting/return, in order to prevent any oscillation of the blades from causing marks or imperfections on the freshly cut surfaces.

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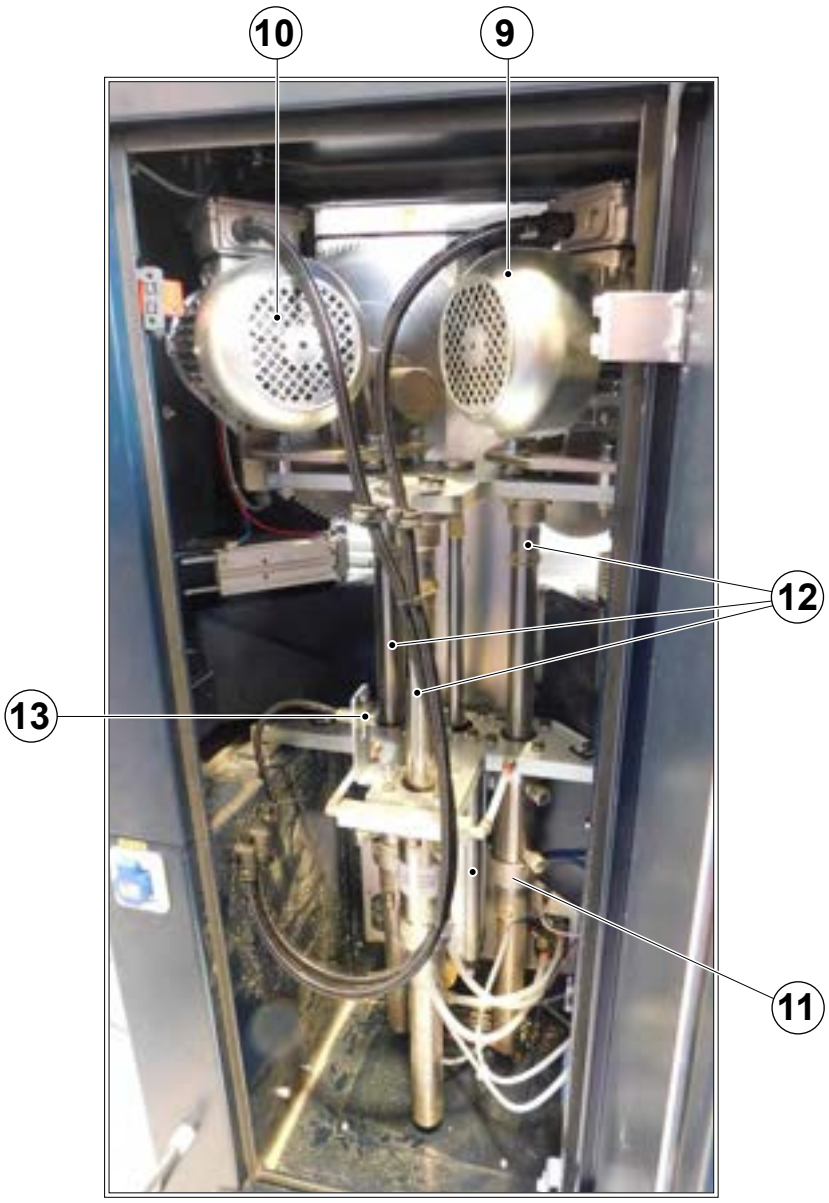

Figure 2 - 7

cont. ...

Functional characteristics

The guards (12) and (13) protecting access to the workpiece in the cutting area are automatically adjusted to the frame profile before machining, using a specific learning procedure (see chapter 4).

The pressure regulator (14) for the vertical locking systems and the pressure regulator (15) for the horizontal locking systems are located at the top of the front section.

The electronic system (16) for measuring the width of the piece/moulding is located on the left-hand side.

Figure 2 - 8

2.3.2. Mobile stop unit

Functional characteristics

The mobile stop unit, equipped with its own supporting structure (1), consists of:
- motorised trolley (2);
- arm (3) equipped with a capacitive workpiece detection sensor;
- Brushless drive system (4).

This allows the cutting positions to be programmed from the operator panel.

Figure 2 - 9

2.4. TECHNICAL SPECIFICATIONS

2.4.1. Technical data

Maximum dimensions			
Measurement (A)	(A1) 1760mm	(A2) - Work surface height from the floor- 1010mm	
Measurement (B)	3850mm (Version AG3000)	2850mm (Version AG2000)	
Measurement (C)	5850mm (Version AG3000)	4850mm (Version AG2000)	
Measurement (D)	700mm		
Measurement (E)	1200mm		
Measurement (F)	800mm		

Weights	Machine body	Mobile stop unit
Approx. weight	500kg	150 / 180kg

Pneumatic system			
Feed pressure		Min. 5bar	Max. 8bar
Working pressure		5 / 7bar	
Presser cylinder pressure		Min. 1.5bar	Max. 4bar
Rated consumption		35Nl / Sec	
Connection type	RL15 10 1/4”	Extraction ports size Ø	80mm

Table 2 - 1

cont. ...

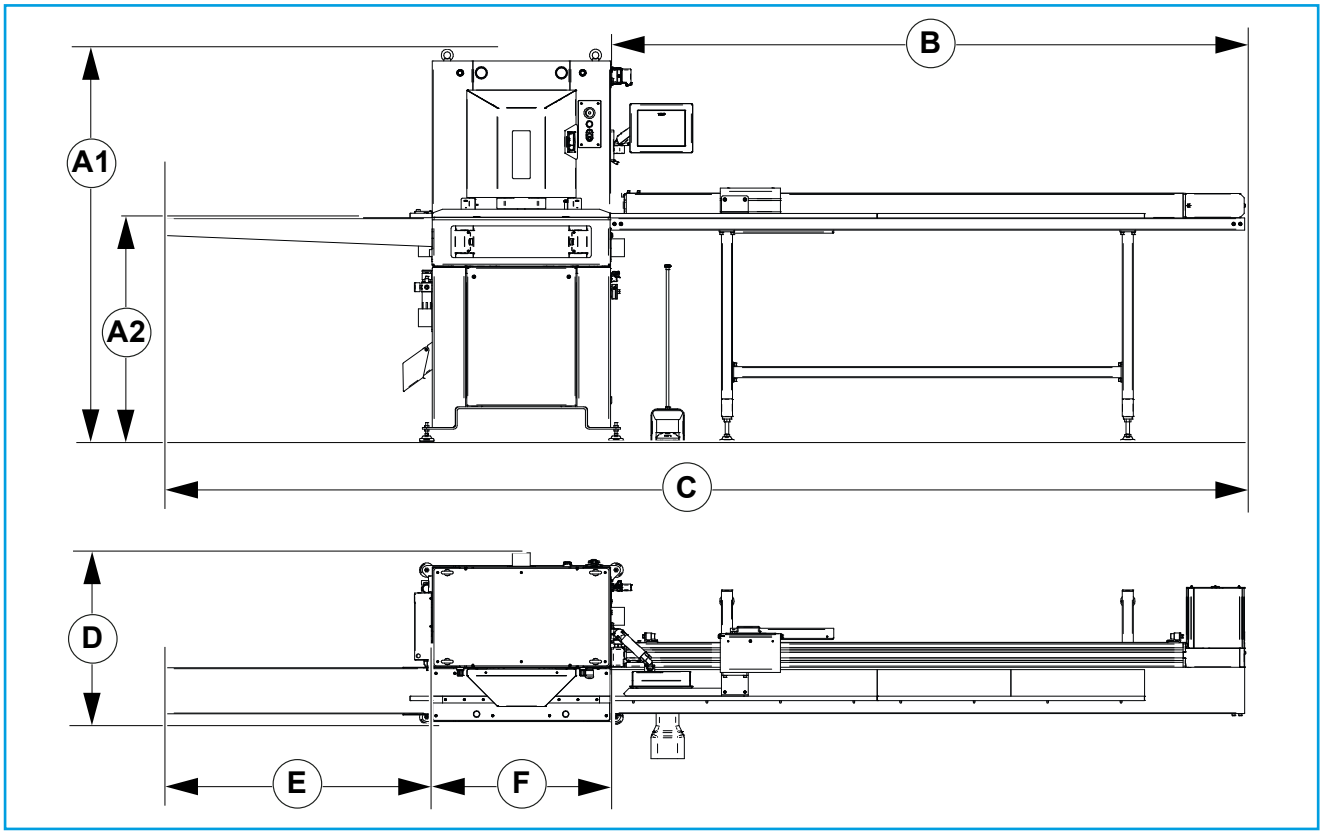

Figure 2 - 10

cont. ...

Electrical system		
Power supply voltage	400VAC	
Auxiliary voltage single-phase power supply	220VAC / 1.5kW	
Frequency	50Hz	
Power installed	6kW	
Electric current	12.5A	
Number of phases	3 Ph+N	
Auxiliary circuits voltage	24 VDC	
Dust extraction (optional)	Single-phase motor power: 2HP	Suction power: 3000m³/h-

Blades	
External diameter	400mm
Internal diameter	30mm
Thickness	3.5-4mm
Number of blades	2
Rotation speed	3000 rpm
Cutting unit stroke	300mm

Cutting capacity	
Maximum height of workpiece	80mm
Maximum width of workpiece	100mm
Minimum EXTERNAL dimension of workpiece	125mm
Cutting characteristics	45° vertical cut

Mobile stop unit	
Model AG2000 - Max external cut measurement	2200mm
Model AG3000 - Max external cut measurement	3200mm

Operator panel		
Display	10” - 800x600 - Resistive touch screen with HMI graphic interface for creating and storing cutting programmes.	
Communication/connection ports	1 RJ45 BUS port 1 RJ45 LAN-Ethernet port (optional) 1 RS232C port (optional)	2 USB type A ports
Memory cards (optional)	1 32 GB Mini SD card	

Table 2 - 2

2.4.2. Noise

Noise emissions

The level of noise emitted by the machine in operation, measured at a distance of 1 m from the operator position and 1.6 m above the ground, as prescribed by Machinery Directive 2006/42/EU, is:
92.9 dB (A)

3 INSTALLATION

CONTENTS

3.1. INTRODUCTION

General information

This chapter provides the technical data and specifications of the machine and its components which need to be taken into consideration during installation.
This information must be taken into account when planning and installing the machine.
This chapter includes drawings showing the overall dimensions and hook-up points.
All values are expressed in millimetres unless otherwise stated.
All dimensions must be observed.

3.2. GENERAL SAFETY REGULATIONS

Prohibited ambient conditions

WARNING
This machine has not been designed to work in potentially explosive atmospheres.
It is therefore strictly prohibited to install or use it in such an environment.

Essential characteristics of personal protective equipment

Wear PPE that is:
- suitable for the operations being performed;
- resistant to the products used for cleaning.

Workwear characteristics

Observe the following indications when choosing what clothing to wear during the installation operations:
- clothing must be close-fitting;
- do not wear ties, necklaces or belts that could get caught up or trapped between moving parts.

Safety rules

WARNING
- **Long hair must be adequately tied up to stop it from getting caught up in moving machine parts or components.**
- **All workwear and PPE must meet the requirements of current legislation governing personal protective equipment.**

cont. ...

cont. ...

Personal protective equipment to be worn

When lifting, transporting, handling and installing the machine, always wear the following personal protective equipment:

safety footwear;

Close-fitting workwear;

protective gloves;

hard hats.

Authorized installation personnel

All lifting, transport, handling and installation operations may only be carried out by authorized personnel trained in the use of lifting equipment, who will:

- ensure the safety of operators and any exposed persons;
- avoid damaging the machine in any way.

Lifting gear characteristics

Lift the units with lifting gear that is:

- suitable for the size and weight of the load;
- in good condition.

WARNING
Lifting gear must have a working load limit which is 20% higher than the weight of the load being handled.

cont. ...

cont. ...

Rules for authorised installation personnel

Authorized personnel must observe the following rules:
- never stand or pass under the machine when it is being lifting or moved;
- never manoeuvre or rotate lifted units by pulling on cables or piping;
- always use appropriate and safe means of access whenever it is necessary to work above the machine; never climb up or onto the machine.

Rules for putting the machine into service

Once installation operations have been completed, before starting up the machine, always check that:
- all equipment used during installation operations has been removed from the machine and the surrounding area;
- all the guards and safety devices have been correctly installed and are working properly.

Rules for the person in charge

At the end of installation operations, the machine may only be started after permission has been given by the person in charge, who must ensure:
- that all installation operations have been completely and correctly carried out;
- that guards and safety systems are active;
- that the machine is working correctly.

3.3. HOOK-UP POINTS AND POWER SUPPLY SHUT-OFF

Introduction

Figure 3-1 shows the location of the energy supply hook-up points:

- electricity (A); connect the supplied cable (B) to the factory power supply using a suitable connector (not included in the supply);

NOTE
Depending on the cable used, the colouring of the wires can be:
- Brown/grey/black for Phase (F) wires;
- Light blue for Neutral (N) wires;
- Yellow -Green for the “Hearth” (T) cable.

Or cable with numbered conductors:
- Black (1), Black (2), Black (3), for phases (1), (2) and (3);
- Black (4), for Neutral (N) cable.
- Yellow -Green for the “Hearth” (T) cable.

- pneumatic energy (C); to the 1/4" connection (D).

For technical specifications, see heading 2.4.1 “Technical Data”.

Isolation from electrical power

To isolate the machine from electrical power, switch the main isolator (E) located on the electrical cabinet door to the ‘OFF’ or ‘0’ position and lock it with a suitable locking device (padlock).

Compressed air supply shut-off

To shut off the compressed air supply to the machine, act on the padlockable valve (G) located on the air treatment and regulator unit and secure it in the off position with a padlock.

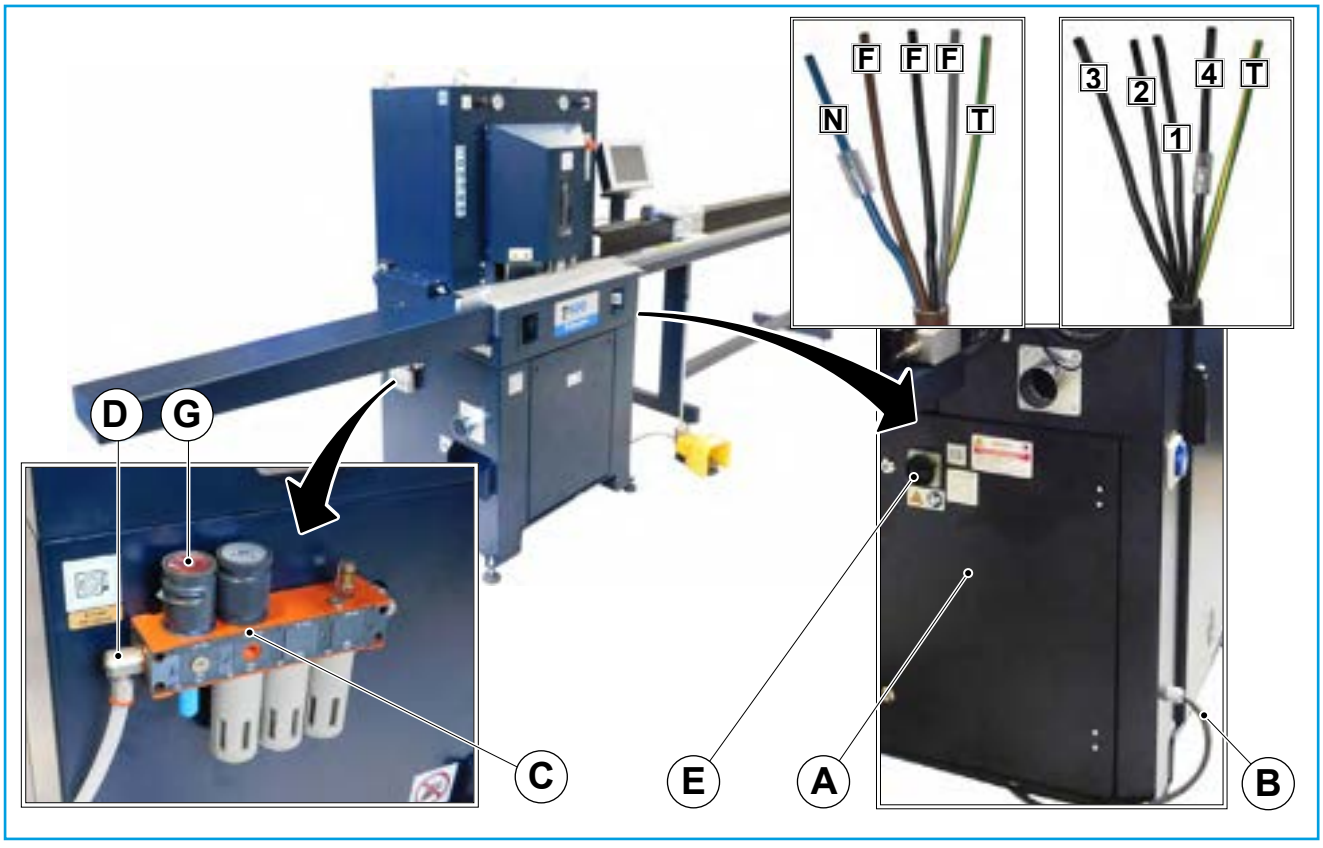

Figure 3 - 1

3.4. PRELIMINARY WARNINGS BEFORE INITIAL START-UP

Warnings for correct connection to the power supply

CAUTION
When starting up the machine for the first time, check that the blades are rotating in the correct direction; if they are rotating in the opposite direction, reverse two of the three electrical phases inside the external industrial power connector supplied.

Warnings for opening interlocked guards

CAUTION
ABSOLUTELY AVOID forcing open guards equipped with interlocks.

For transport purposes, the machine is delivered with the guards closed and, in the case of guards equipped with interlocks, these can only be opened with the machine connected to the power supply and following the procedure described in paragraph 4.11 'Procedure for accessing the interior of the guards'.

Rules and procedures to be observed

The following warnings and preliminary instructions to be observed are provided on the machine packaging (see fig. 3-2).

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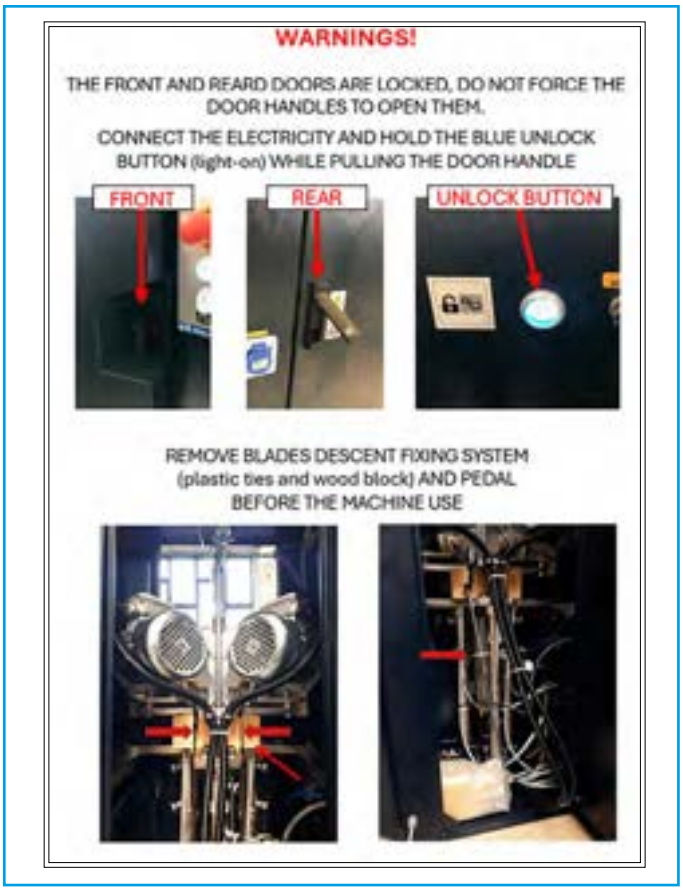


Figure 3 - 2

cont. ...

Rules and procedures to be observed

WARNING

The front and rear doors are locked; do not force the handles to open them:

- connect the power supply and press and hold the blue unlock button (A) (light on) while pulling the door handle (B) or (C).
- Once the guards are open, remove the fasteners for lowering the blades (plastic ties D) and wooden block (E).
- Then remove the pneumatic control pedal (F).

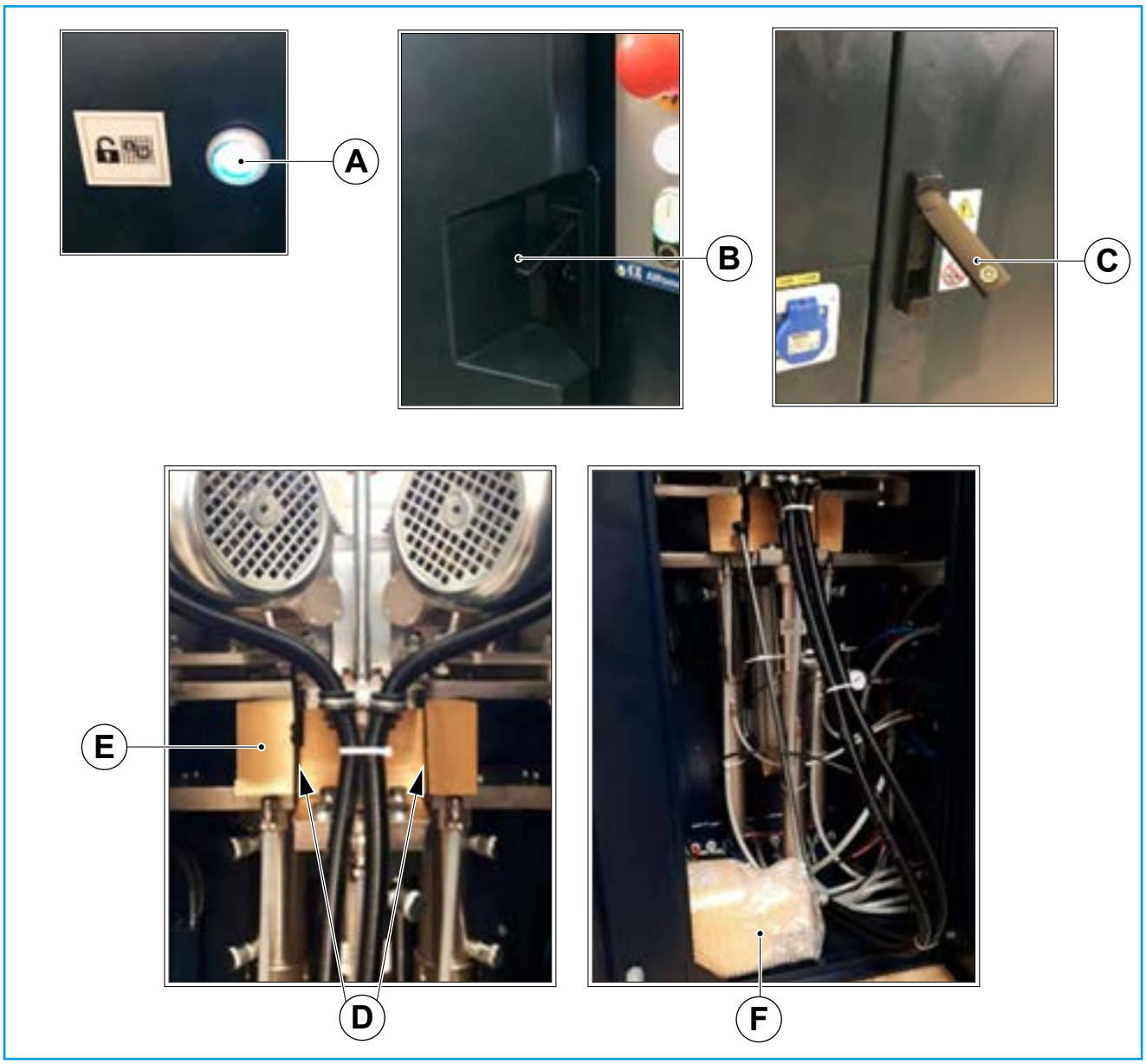


Figure 3 - 3

3.5. AUXILIARY EQUIPMENT

3.5.1. Lifting gear

Equipment characteristics

The following equipment is needed when unpacking the machine:

Equipment	Minimum capacity (kg)	Notes	Q.ty
Electric forklift or pallet jack	2500	Lift 200 mm Fork length 1500 mm.	1

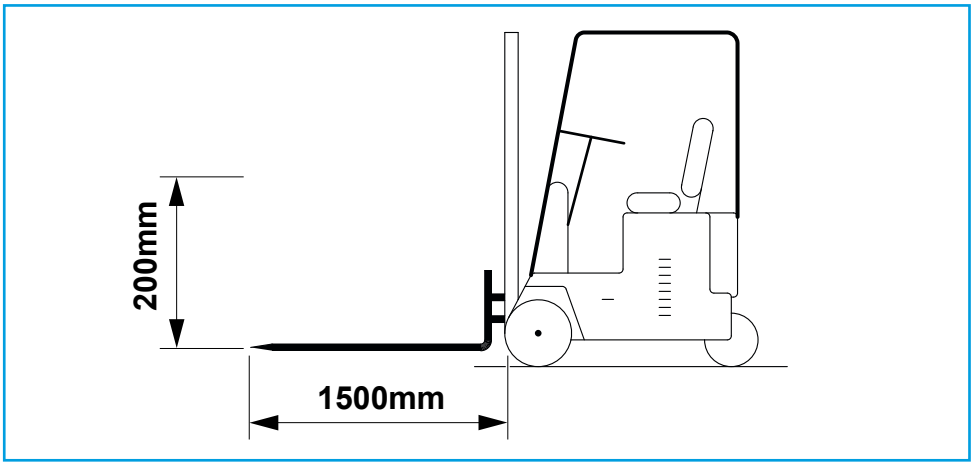


Figure 3 - 4

3.5.2. Tools and devices supplied

List of tools supplied

The following equipment is needed when unpacking the machine:

Tool
• 5 mm, 6 mm and 8mm Allen Key
• 13mm, 10mm, 17mm, 22mm Allen Key
• Key for opening doors and electrical panel.

3.6. ENVIRONMENTAL, CLEARANCE AND SET-UP REQUIREMENTS

Introduction	Measure and mark out the end position of the machine. It is advisable to ensure an adequate operating space of at least 1500 mm on all sides of the machine, as shown in figure 3-5.
Ambient temperature	Make sure the ambient conditions for machine installation and operation meet the following specifications: Recommended storage temperature: from +5°C to + 40°C.
Ceiling height	The ceiling height must be at least 3000 mm.
Installation area	The area must be free from all obstacles and cordoned off by barriers or white and red tape. Put up a "No access to unauthorized personnel" sign. The flooring must meet requirements of suitability for moving packages with forklift trucks.
Lighting	The installation area must be well lit, in compliance with current regulations, and the work areas must reach a level of lighting of at least 300 lux.

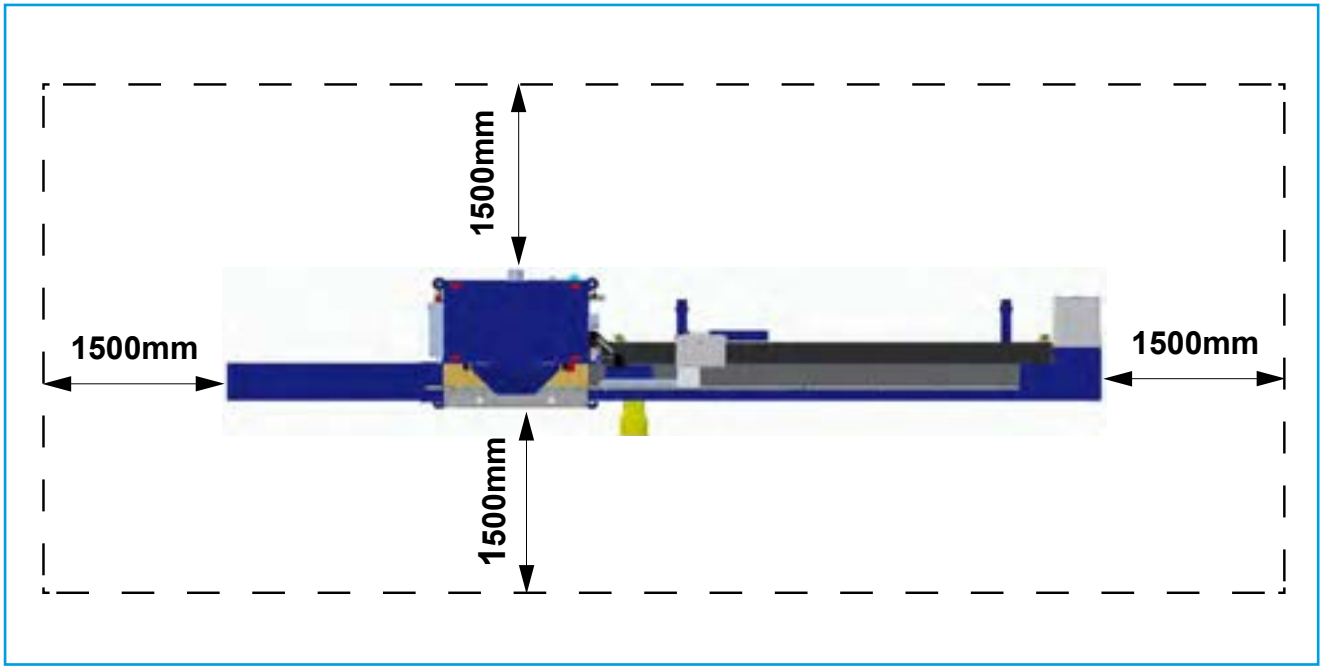


Figure 3 - 5

3.7. HANDLING AND UNPACKING

3.7.1. Packaging characteristics

Packaging configuration

The machine is packed and arranged on a pallet for shipping and handling.
Some components are disassembled for packaging and transport needs.

Safety rules

WARNING

- **Avoid subjecting the packaging to impact or sudden movements.**
- **NEVER stack the packaging or place other materials on it.**
- **During transit, the packaging must always be kept in a vertical position and never tilted or turned upside down.**

3.8. LIFTING AND UNLOADING

3.8.1. Handling of machine and components in pallet packaging

Requirements to be observed

WARNING
Lifting gear must have a working load limit which is 20% higher than the weight of the load being handled.
For the weights being lifted and handled, see heading 2.4.1 "Technical data".

Introduction

CAUTION
Move the package slowly and with extreme care

If installation is to be carried out immediately, see if the packaging can be moved directly to the installation site.
Removal of the packaging and machine installation can then be performed at the same time.

Work instructions

When moving a package to the installation site, as shown in the examples in the figure, place it so that it can be lifted and positioned without the need to rotate it.

Step	Description
1	Lift only enough to detach it from the floor, ensuring that the package remains stable when suspended.
2	Move the package to its final destination.
3	Lower the package slowly to the ground, taking care to leave enough space on all sides for easy access.
4	Make sure that the pallet supporting the package is firmly set down.
5	Remove the lifting equipment.
6	Carefully remove the adhesive tape and protective film.

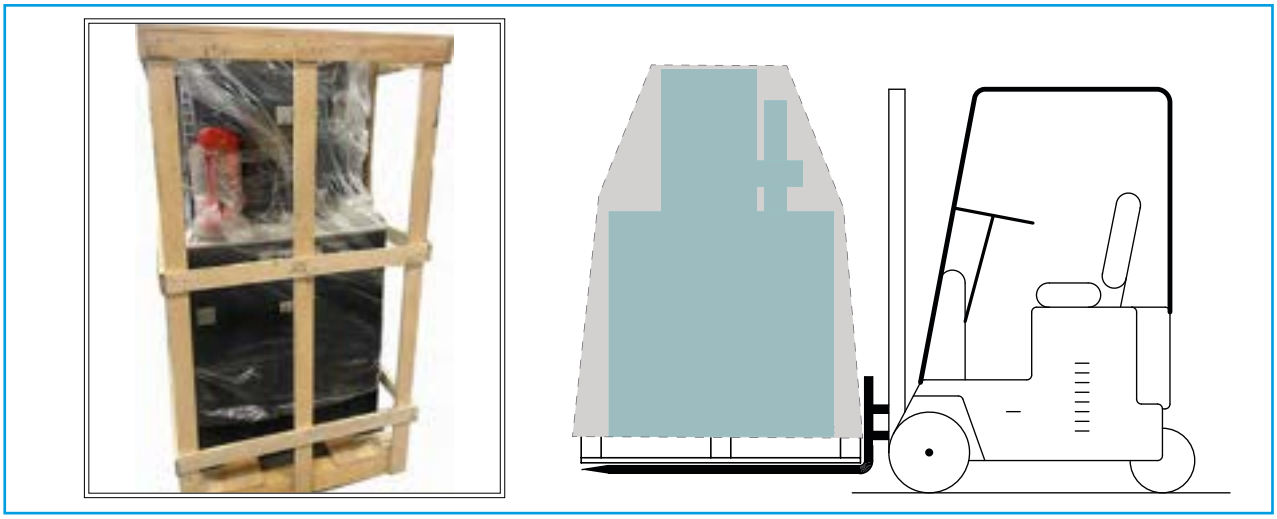


Figure 3 - 6

3.8.2. Disposal of reusable and waste materials

Disposal of packaging materials

NOTE
Packaging materials (wrapping materials and boxes) must not be returned to the manufacturer unless otherwise agreed.

Work instructions

Step	Description
1	Check with the customer whether or not a special agreement has been made for returning the packaging to the manufacturer.
2	If packaging must be returned to the manufacturer, set up an area for storing the crates and all the packaging materials to be returned.
3	Check with the manufacturer whether or not a special agreement has been made for recycling the packaging.
4	If packaging is to be recycled, check how materials are to be divided (wood, plastic, paper, etc.) and disposed of.
5	Dispose of polluting waste (bubble wrap, plastic bags, polystyrene, etc.) in accordance with current legislation.

3.9. MACHINE POSITIONING AND COMPLETION OF ASSEMBLY

3.9.1. Machine positioning

Requirements to be observed	**WARNING** • Machine weight: 500kg **Lifting gear must have a working load limit which is 20% higher than the weight of the load being handled.** **The unpacked machine must be handled by at least 2 operators.**
Work instructions	***CAUTION*** ***Move the machine slowly and with extreme care***

Step	Description
1	Make sure the machine remains stable when lifted.
2	Move the machine to its final destination as follows: • using a lifting system equipped with ropes or chains of a length and capacity suitable for the weight to be lifted, using the appropriate eyebolts (A); or, alternatively, • by inserting the forks of a forklift (or pallet truck) into the points marked with the appropriate labels shown in the example in the figure, in the space provided below it.
3	Lower the machine slowly to the ground, taking care to leave sufficient space on all sides for easy access, and level it using the adjustable support feet (C).

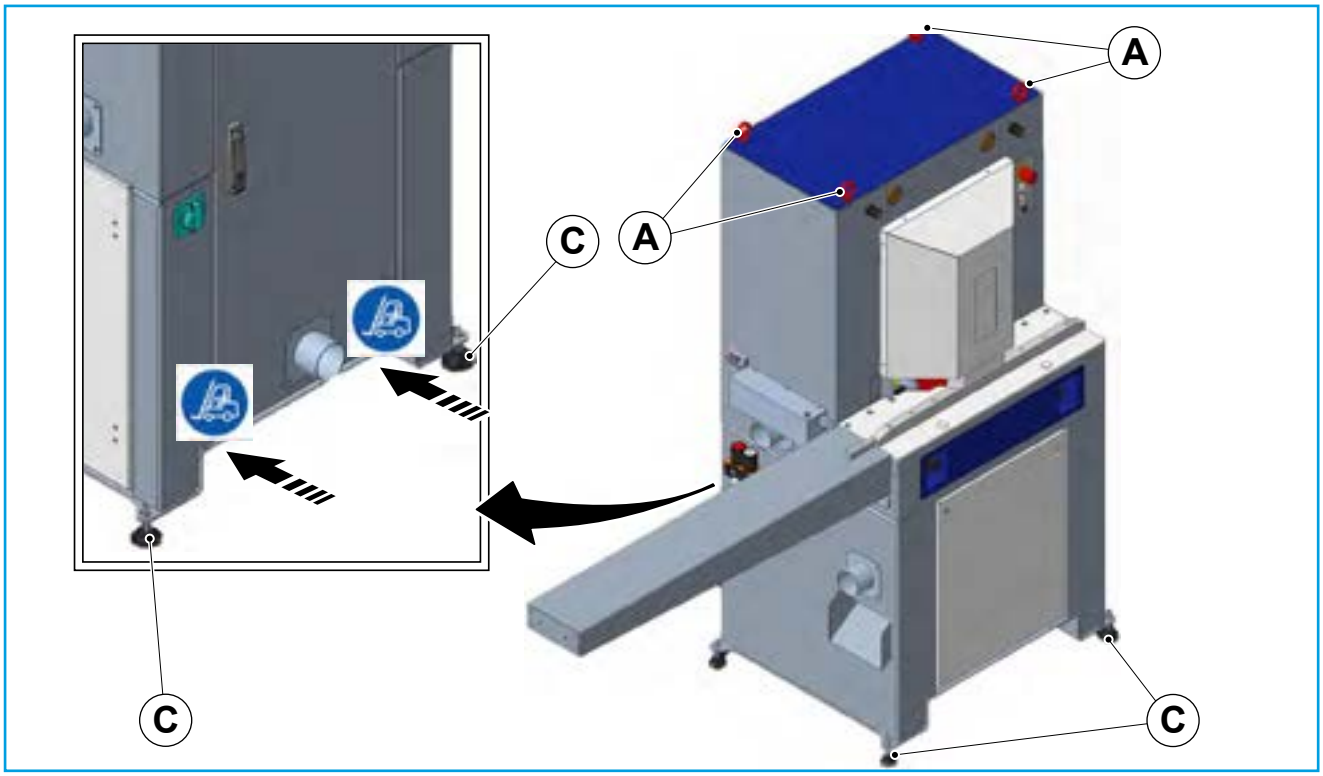


Figure 3 - 7

3.9.2. Unpacking and positioning the mobile stop unit

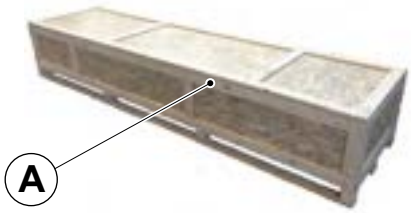
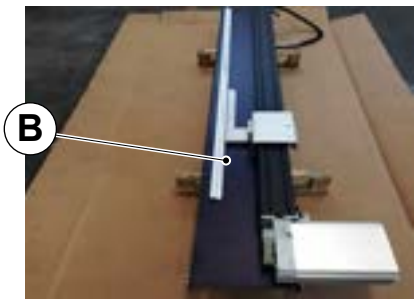
Requirements to be observed

WARNING
Connection to the general electrical and pneumatic power supply must be carried out by qualified and authorised electrical/ maintenance operators, who must also consult the electrical and pneumatic diagrams provided in the appendix to this documentation.

Introduction

CAUTION
The components that make up the mobile stop unit are supplied disassembled and packed in a crate, as shown in the example in the figure; handle the components slowly and with care.

Work instructions

Step	Description	
1	Open the lid (A) of the packaging.	
2	Remove the upper structure (B) of the mobile stop unit and place it on the floor.	 

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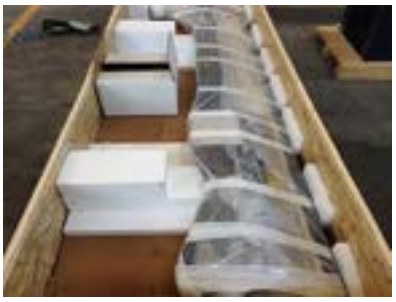
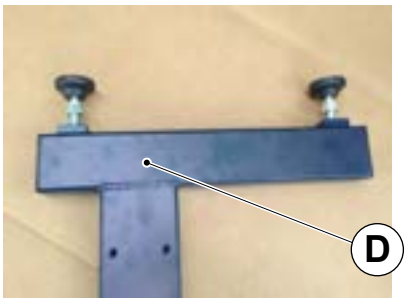
Work instructions

Step	Description	
4	Remove all components of the support structure. (Screws, fasteners and adjustable support feet are included in the supply).	
		
5	Install the four adjustable support feet (C) on both legs (D); the height will be adjusted when the mobile stop unit is connected to the mitre saw.	
		

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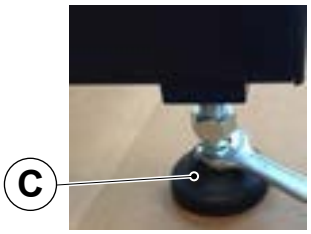
Work instructions

Step	Description		
6	Connect the two legs by screwing both sides of the bar with the respective screws, as shown in the figure.		
			
7	Place the complete leg support on a flat floor and level it by adjusting the four feet (C).		
			
			

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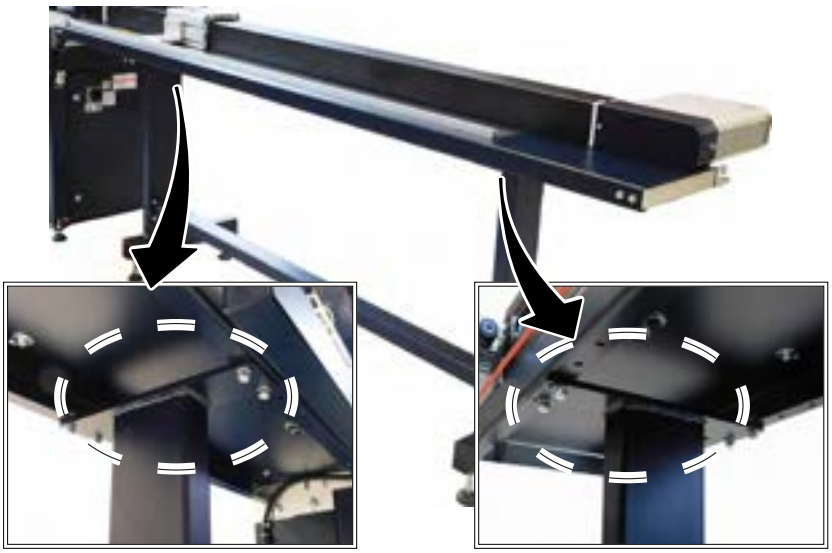
Work instructions

Step	Description
8	Place the upper structure (B) of the mobile stop unit on the support legs.  
9	Secure the upper structure to each leg with the respective screws, as shown in the figure. 

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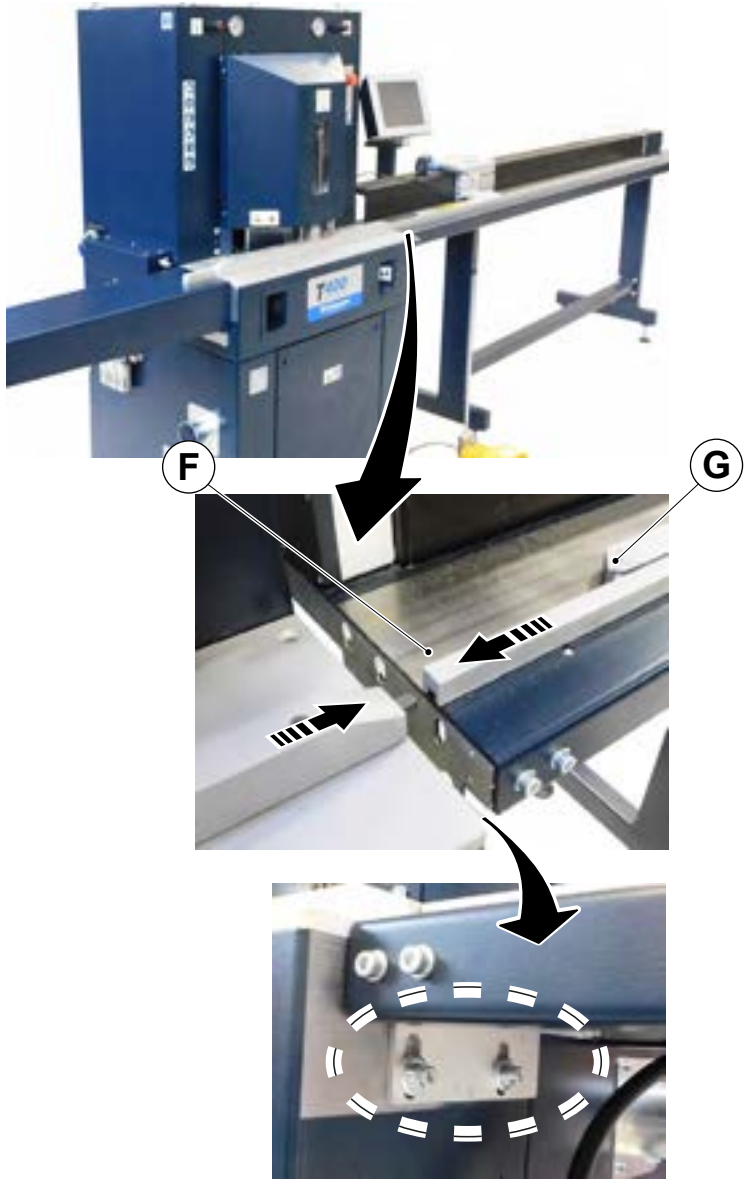
Work instructions

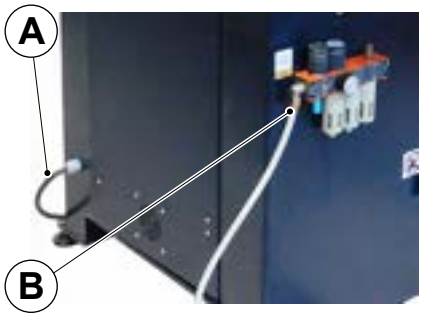
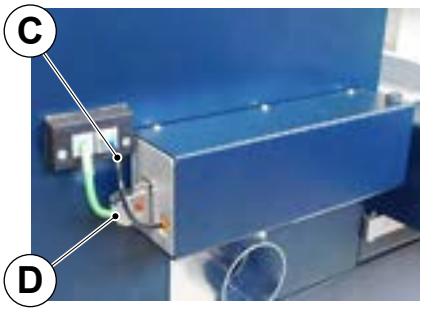
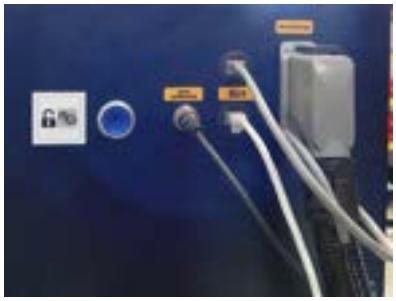
Step	Description
10	• Move the mobile stop unit closer to the mitre saw, ensuring that the tab (F) on the mitre saw fits into the guide (G) on the mobile stop unit. • Ensure that the surface of the mobile stop unit is perfectly aligned (flush) with the surface of the mitre saw by adjusting the adjustable feet and, once levelling is complete, tighten the lock nuts on the feet. • Secure the mobile stop unit to the mitre saw using the screws and washers provided.
	

3.10. ELECTRICAL AND PNEUMATIC CONNECTIONS

Requirements to be observed

WARNING
Connection to the general electrical and pneumatic power supply must be carried out by qualified and authorised electrical/maintenance operators, who must also consult the electrical and pneumatic diagrams provided in the appendix to this documentation.

Work instructions

Step	Description	
1	• Connect the general power supply via the cable (A), using a suitable connector (not included in the supply) to the factory power supply source; • Connect the pneumatic supply to the 1/4" connection (B).	
2	Connect the moulding width measurement system using: • the 4 mm tube (C) for the pneumatic connection; • the connector (D):	
3	• Install the operator panel (E) using the corresponding bracket to be fixed to the machine structure. • Then connect all cables and connections as shown in the figure, following the respective nomenclature on the corresponding labels.	
	CAUTION ***Avoid connecting the BUS cable to the LAN port.***	
		

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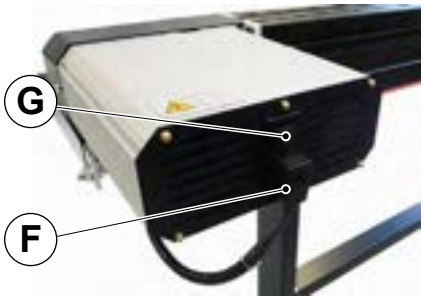
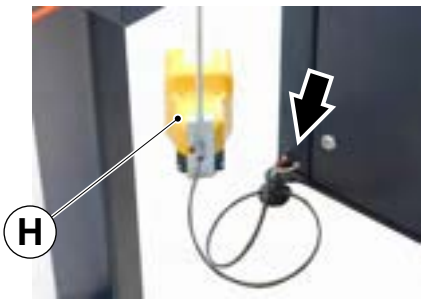
Work instructions

Step	Description	
5	Plug the connector (F) to the mobile stop unit drive system. Ensure that the power switch (G) is switched on, i.e. in the 'I' position.	
7	Then make the electro-pneumatic connections for the pedal control (H).	

3.11. SCRAPPING AND DISPOSAL

General information

The machine construction materials are, for the most part, suitable for recycling. When disposing of the machine, always comply with the legislation in force in the country of use and safeguard the environment.

3.11.1. Disposal of Packaging Materials

Rules to be observed

In accordance with the requirements set out in Directive (EU) 2018/851 on waste, materials must be disposed of by an authorized waste disposal company, which operates in accordance with the legislation in the country of machine disposal.

3.11.2. Plastic materials

Material characteristics

Plastic components can be collected for recycling to produce new resources for use in the same sector or be sent to the heat and energy production sector (incineration).
This avoids the disposal of waste in landfills and environmental pollution.

4 OPERATION AND USE

CONTENTS

4.1. OPERATING PRINCIPLES

Introduction

The operating cycle is described below, divided into the zones/phases in which the various operations take place:

Zone	Description
Moulding loading	Area where the moulding to be cut is loaded: the moulding being processed is placed on the support surface (A), where the electronic system (B) detects its exact width.
Work surface	Work/cutting surface: the moulding is first clamped and then cut on this surface. The vertical (C) and horizontal (D) clamping systems, activated by the control pedal (E), clamp the moulding in the preset cutting position.
Moulding cutting	Cutting unit (F): once the moulding has been clamped, the two-hand controls (G) are used to lower the blades (H) and execute a 45° cut, after which the blades return to their initial position, thus completing the moulding processing sequence. The cutting unit can only be activated if at least one vertical clamp has been selected and blade zone safety has been enabled.
Moulding length detection	Mobile stop unit: thanks to the arm (I) fitted with a capacitive sensor, this unit allows the cutting system to be adjusted automatically in accordance with the cutting position settings entered and managed on the operator panel (minimum moulding width which can be detected by the sensor: 3mm).

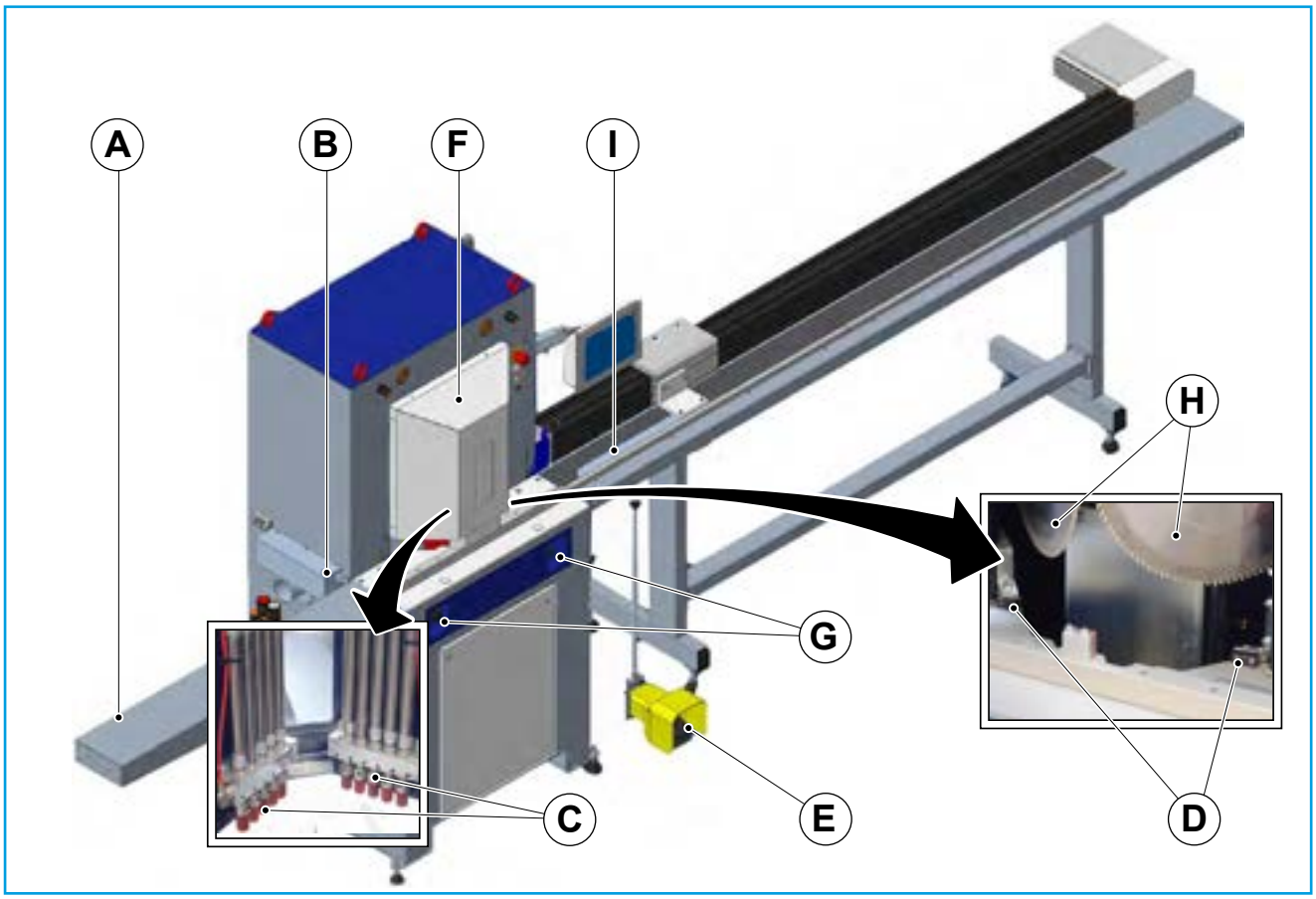


Figure 4 - 1

4.2. INTENDED USE AND IMPROPER USE

Intended use

The T400evo machine is designed for precision cutting mouldings at a 45-degree angle for frames and woodworking applications such as windows, doors and furniture components within the limits specified in sections:

- heading 2.1 "Machine Overview";
- heading 2.4.1 "Technical data".

Machine operators

The machine is run by a single operator, whose tasks include:

- loading and cutting the moulding.
- setting the processing parameters and specifications.

IMPROPER USE

The machine described in this manual must not be used for any purpose other than that for which it was intended as specified in the heading "Intended use".
Any use other than that for which the machine was designed, as described in this manual, shall be considered "IMPROPER USE" and shall consequently exonerate Alfamachine S.r.l. from all liability for any injuries to people and/or animals and/or damage to property and/or the machine itself.

WARNING
Use of the machine by more than one person at the same time is prohibited.
Any use of the machine other than that for which it was designed may give rise to hazardous conditions for operators/maintenance personnel and any other exposed persons and may damage the machine itself.

Permitted ambient conditions

The machine described in this manual must be installed and used in an indoor location which has suitable ambient conditions for operators and for processing the product. Ambient temperatures must be within the following range:

- Minimum: 5°C
- Maximum: 40°C

Prohibited ambient conditions

WARNING
Installation and use of the machine in the following environments is strictly prohibited:

- potentially explosive atmospheres;
- atmospheres polluted by vapours or gases, suspended dust, bacterial loads, insects or anything else that may jeopardize safety conditions for the product and operators.

4.3. WORK, CONTROL AND DANGER ZONES

Definitions

NOTE
Pursuant to Directive 2006/42/EC, the following definitions are provided:

- DANGER: Potential source of injury or damage to health.
- DANGER ZONE: any zone within and/or around machinery in which a person is subject to a risk to his health or safety.
- EXPOSED PERSON: any person wholly or partially in a danger zone.
- OPERATOR: the person or persons installing, operating, adjusting, maintaining, cleaning, repairing or moving machinery.
- RISK: a combination of the probability and the degree of an injury or damage to health that can arise in a hazardous situation.

Control and operation zones

WARNING
Under normal operating conditions, the machine must be controlled and operated only and exclusively from the specifically designated areas (described in heading 4.3.1 "Work zones and danger zones").
These areas are free of risks for personnel and are called "Operator control and work zones."

Safety rules

WARNING
It is strictly prohibited to stand or do any work in the danger zones (described in heading 4.3.1 "Work zones and danger zones") when the machine is in operation.
Maintenance personnel may only work in and around the machine after it has been stopped and placed in safety conditions.

4.3.1. Work zones and danger zones

Work zones

Work zones include:

A. Operator work zone, near the moulding feed and cutting surface.
B. Operator command and control zone, near the operator panel, the two-hand control buttons, the on-board control panel, and the control pedal.

Danger zones

WARNING
Danger zones also include:

- the inside of the electrical cabinet;
- the whole work area inside the cutting unit;
- all areas safeguarded by special safety systems such as interlocking guards, protective covers, etc.;
- all areas inside control units and junction boxes.

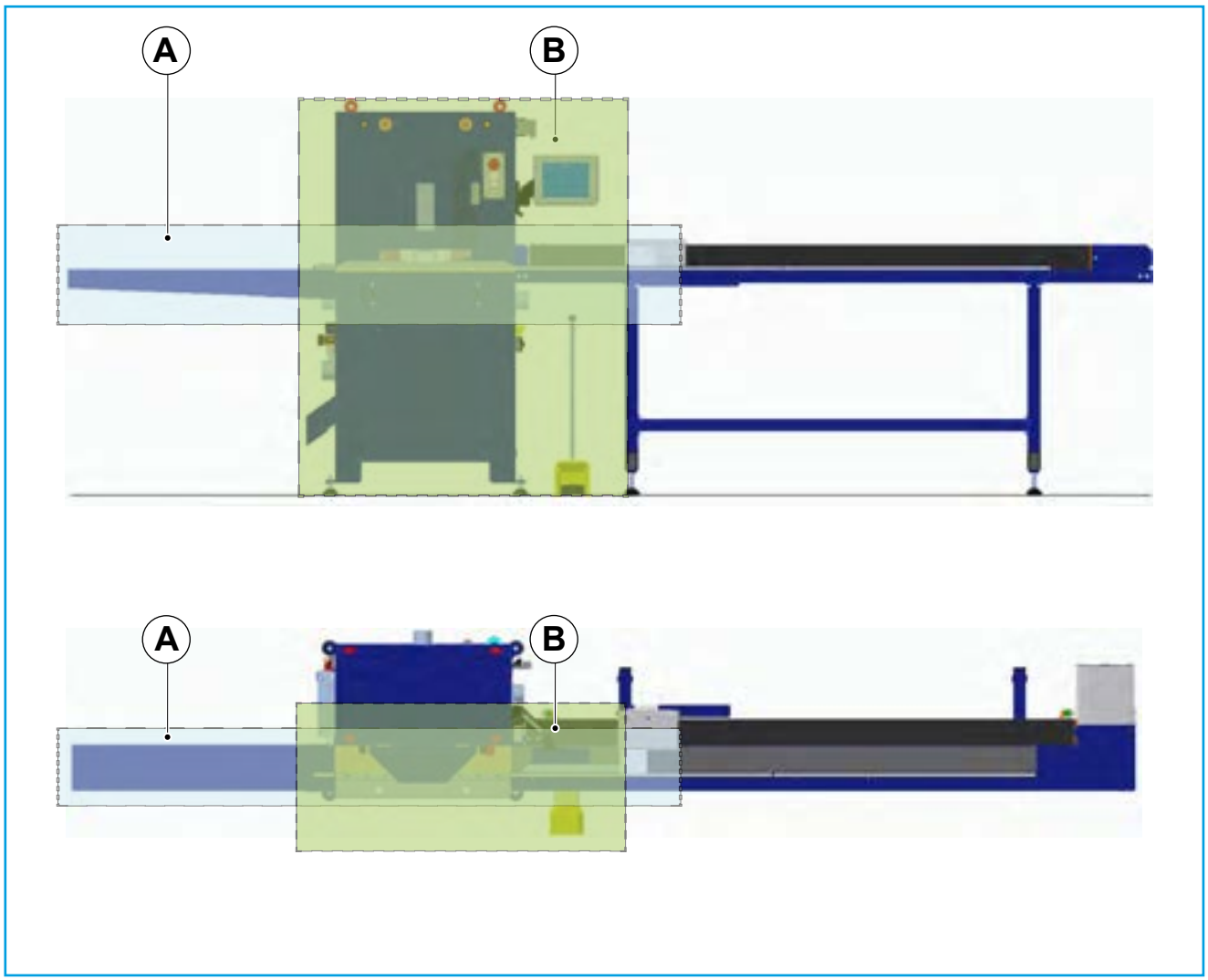


Figure 4 - 2

4.4. HAZARDS AND RESIDUAL RISKS

4.4.1. Residual risk of electrocution

Source of residual risk	This risk is present whenever it is necessary to work inside electrical cabinets and/or junction boxes in the presence of live voltage for the purpose of carrying out inspections, maintenance and operating tests.
Safety measures adopted	Areas that may present a residual risk of electrocution are protected by special protective covers. Furthermore, warning labels are affixed to these protective covers (see the example in the figure, indicating the presence of hazardous voltage).
Safety rules	**WARNING** **Interventions which require access into the aforementioned areas must be performed solely and exclusively by expert, authorized "maintenance operators/electricians" who must strictly observe all the safety regulations concerning electrical systems.**

Figure 4 - 3

4.4.2. Crushing and cutting residual risks

Source of residual risk

These risks exist during maintenance operations in the internal area near the cutting blades (A).

Safety measures adopted

The area where crushing and cutting residual risks are present is protected by a special guard controlled by an electric lock. Warning labels are also affixed to this guard, an example of which is shown in the figure, indicating the presence of these residual risks.

Safety rules

WARNING
Any work that involves accessing the vicinity of this area must be carried out by specialized and authorized operators/maintenance personnel who must wear the appropriate and necessary PPE and observe the safety procedures illustrated in this manual.

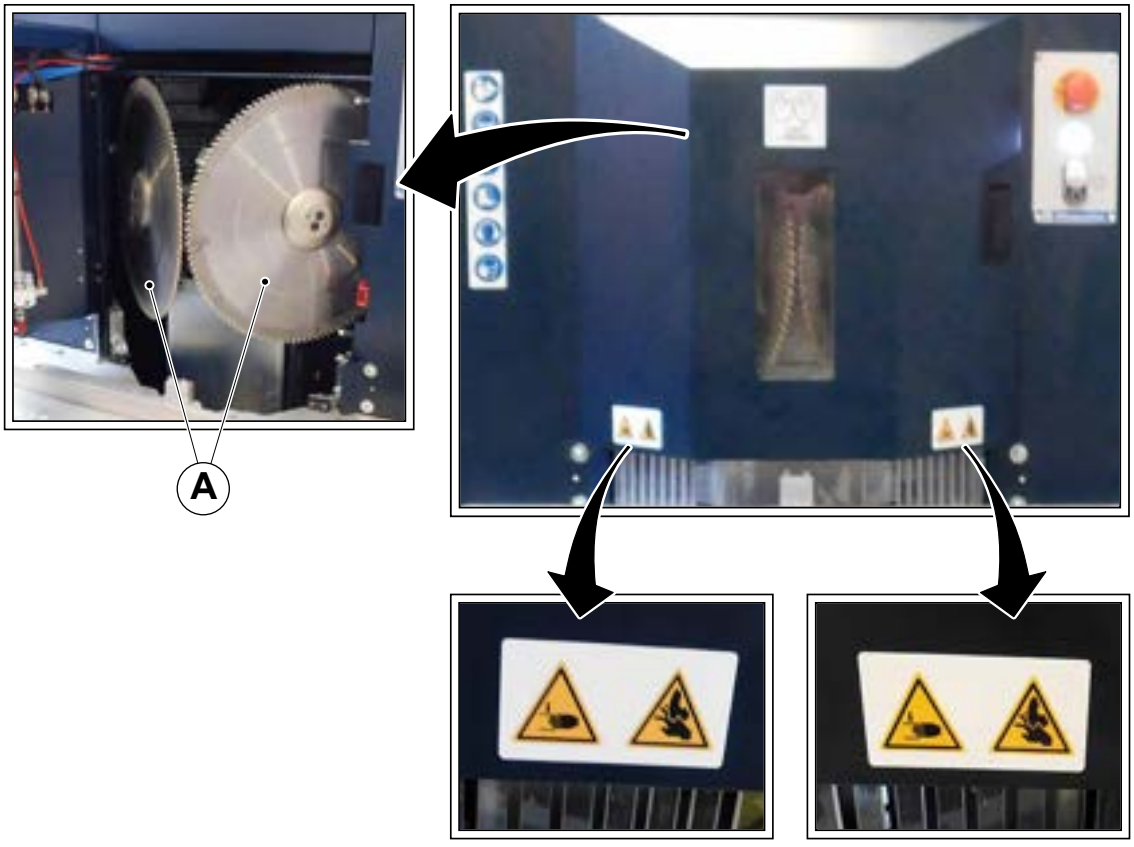


Figure 4 - 4

4.5. SAFETY MEASURES AND DEVICES ADOPTED

Introduction

Figure 4-5 shows the location of the main safety devices installed on the machine.

Pos.	Description	
1	Openable guard fitted with an interlock microswitch.	It can be opened with the machine powered, provided it is stopped, and only after pressing the release button (A).
2	Fixed guard. This can only be opened using specific tools	It can be opened using the specific tools supplied with the machine.
3	Cutting zone automatic guard	When the operator starts the work cycle this guard is automatically lowered so that only the moulding can enter the cutting area. Blade rotation can only be started and the cut executed when the guard is in the correct position.
4	Emergency stop button.	When pressed, this button instantly brings the whole machine to an emergency stop.

Safety rules

WARNING
It is strictly prohibited to tamper with or remove safety devices and guards. Failure to observe this prohibition shall exonerate Alfamachine S.r.l. from all liability for any injuries to people and/or animals and/or damage to property and/or the machine itself.

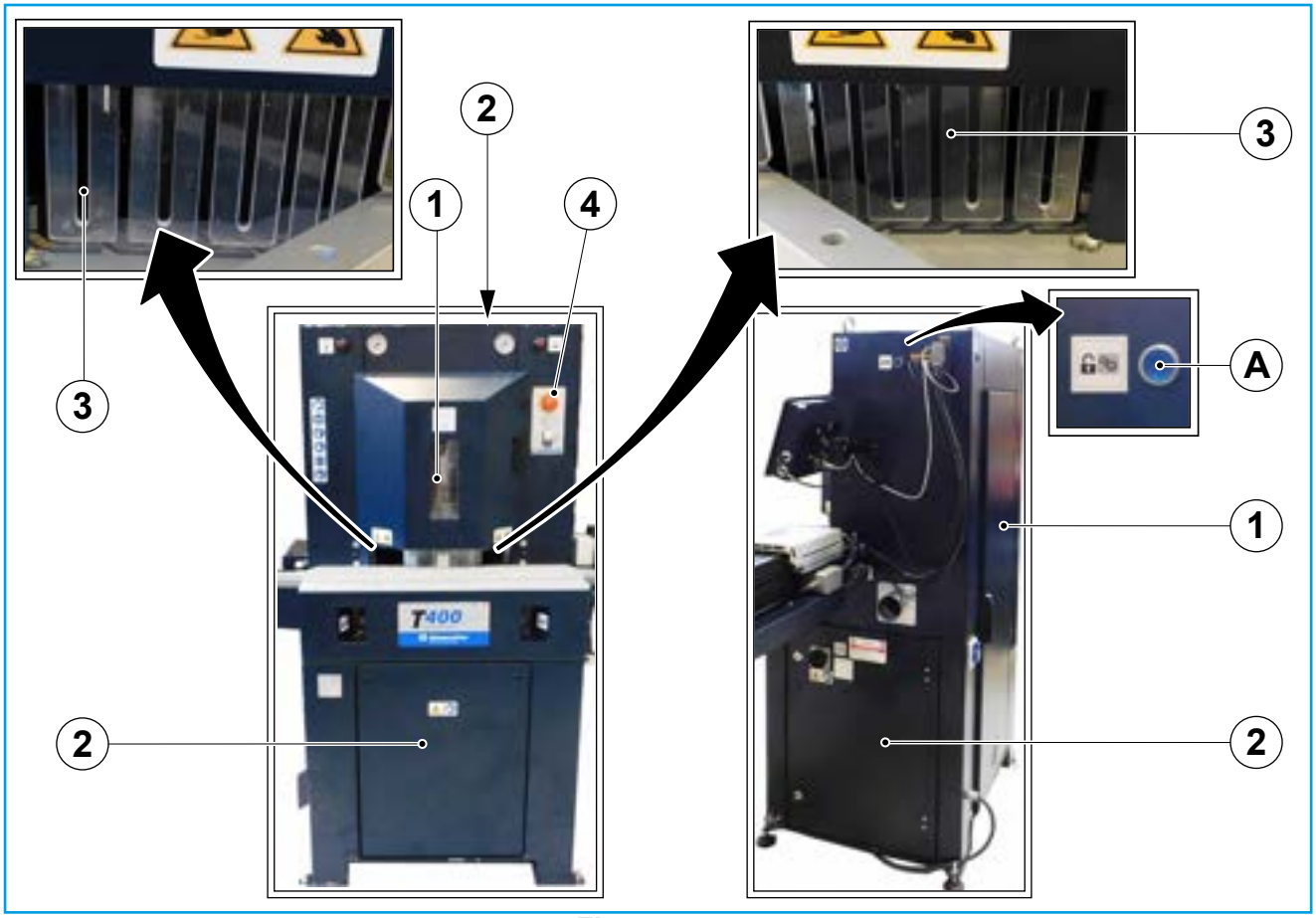


Figure 4 - 5

4.6. PERSONAL PROTECTIVE EQUIPMENT TO BE WORN

Protective equipment

Wear PPE that is:
- suitable for the operations being performed;
- resistant to the products used for cleaning.

Workwear

Observe the following indications when choosing what clothing to wear:
- clothing must be close-fitting;
- do not wear ties, necklaces or belts that could get caught up or trapped between moving parts.

WARNING
Long hair must be adequately tied up to stop it from getting caught up or trapped between moving parts.

Safety rules

WARNING
Before starting any work on/with the machine, the operator and/or authorized maintenance technicians must put on the personal protective equipment indicated in table 4-1.
All workwear and PPE must meet the requirements of current legislation governing personal protective equipment.

Type of PPE		Phase of machine use
	Close-fitting workwear	During all work and maintenance phases
	Safety footwear	During all work and maintenance phases
	Protective gloves	During all work and maintenance phases
	Hearing protection	During all work phases
	Respiratory protection	During all work and maintenance phases
	Hard hat	During all machine installation and dismantling operations.

Table 4 - 1

4.7. SAFETY LABELS AFFIXED TO THE MACHINE

Introduction

Various safety, warning, and information labels are affixed to the machine. These are designed to inform and warn operators and any other exposed persons about any residual risks or prescriptions which must be observed.
Figure 4-6 shows the location of safety labels on the machine. The meaning of the labels is provided in heading 4.7.1 “Description of safety/warning labels on the machine”.

Safety warnings

WARNING
Tampering with or removing safety and warning labels is strictly prohibited.

User's responsibility

WARNING
Periodically check the condition of all safety and warning labels, replacing damaged labels with new ones of the same type if necessary.

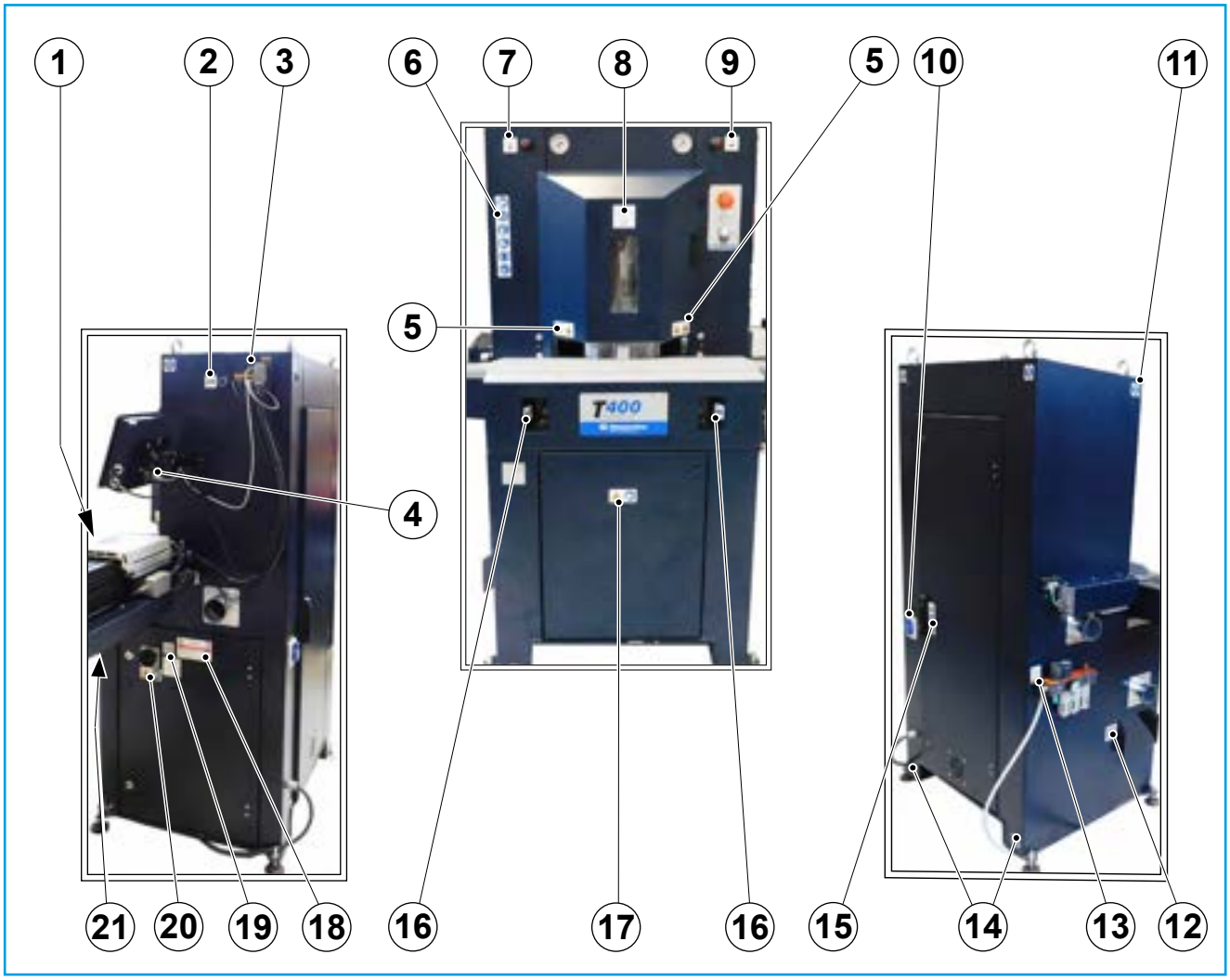


Figure 4 - 6

4.7.1. Description of the safety/warning labels on the machine

Pos.	Label	Meaning
1		Caution. Residual risk of finger crushing.
2		Information. Indicates a guard release function.
3		Information. Ports on the machine body. ● Workpiece detection sensor ● BUS ● Carriage movement system control
4		Information. Ports on the operator panel. ● LAN (optional) ● BUS
5		Danger! Hand crushing and cutting residual risks.
6		Obligation: ● Read the Instruction, Use and Maintenance Manual ● Wear all the prescribed PPE
7		Information. Indicates the operating pressure of the vertical workpiece clamping systems.
8		Information: ● Indicates blade specifications. ● Indicates maximum blade rotation speed.

Table 4 - 2

cont. ...

cont. ...

Pos.	Label	Meaning
9		Information. Indicates the operating pressure of the horizontal workpiece clamping systems.
10		Information. Technical specifications for auxiliary power socket.
11		Obligation. Indicates the machine lifting points (using eye bolts).
12		Prohibition. Never put hands in the outfeed slide.
13		Information: ● Compressed air main shut-off valve ● Indicates the compressed air supply pressure
14		Obligation. Forklift entry points.
15		Generic danger.
		Obligation. Read the Instruction, Use and Maintenance Manual
		Do not work on moving parts
16	 	Information. Indicates the two-hand control buttons.

Table 4 - 3

cont. ...

cont. ...

Pos.	Label	Meaning
17		• Danger! Residual risk of electrocution. • Obligation. Read the Instruction, Use and Maintenance Manual
18		Danger! / Caution: • Residual risk of electrocution. • Working on live electrical equipment is prohibited. • Any exceptions to the aforementioned prohibition must be authorized by the person in charge. • In particularly dangerous conditions, a second person must be present in addition to the person performing the work. • Work should only begin after all safety measures have been implemented.
19		Information. Electrical power supply main disconnect switch
20		• Danger! Presence of pneumatic energy. • Obligation. Read the Instruction, Use and Maintenance Manual
21		Information. Technical specifications for mobile stop unit power socket.

Table 4 - 4

4.8. DESCRIPTION OF COMMAND AND CONTROL DEVICES

Introduction

This section describes the devices used to control and manage machine operations.

Location and description of devices

Pos.	Description
1	Vertical workpiece clamping systems pressure regulator
2	Vertical workpiece clamping systems pressure gauge
3	Horizontal workpiece clamping systems pressure regulator
4	Horizontal workpiece clamping systems pressure gauge
5	Emergency stop button
6	Operation enable/disable button (start/stop blades)
7	Interlocking guards release button
8	Operator panel.
9	Barcode reader (optional)
10	Two-hand control buttons
11	Workpiece clamping control pedal

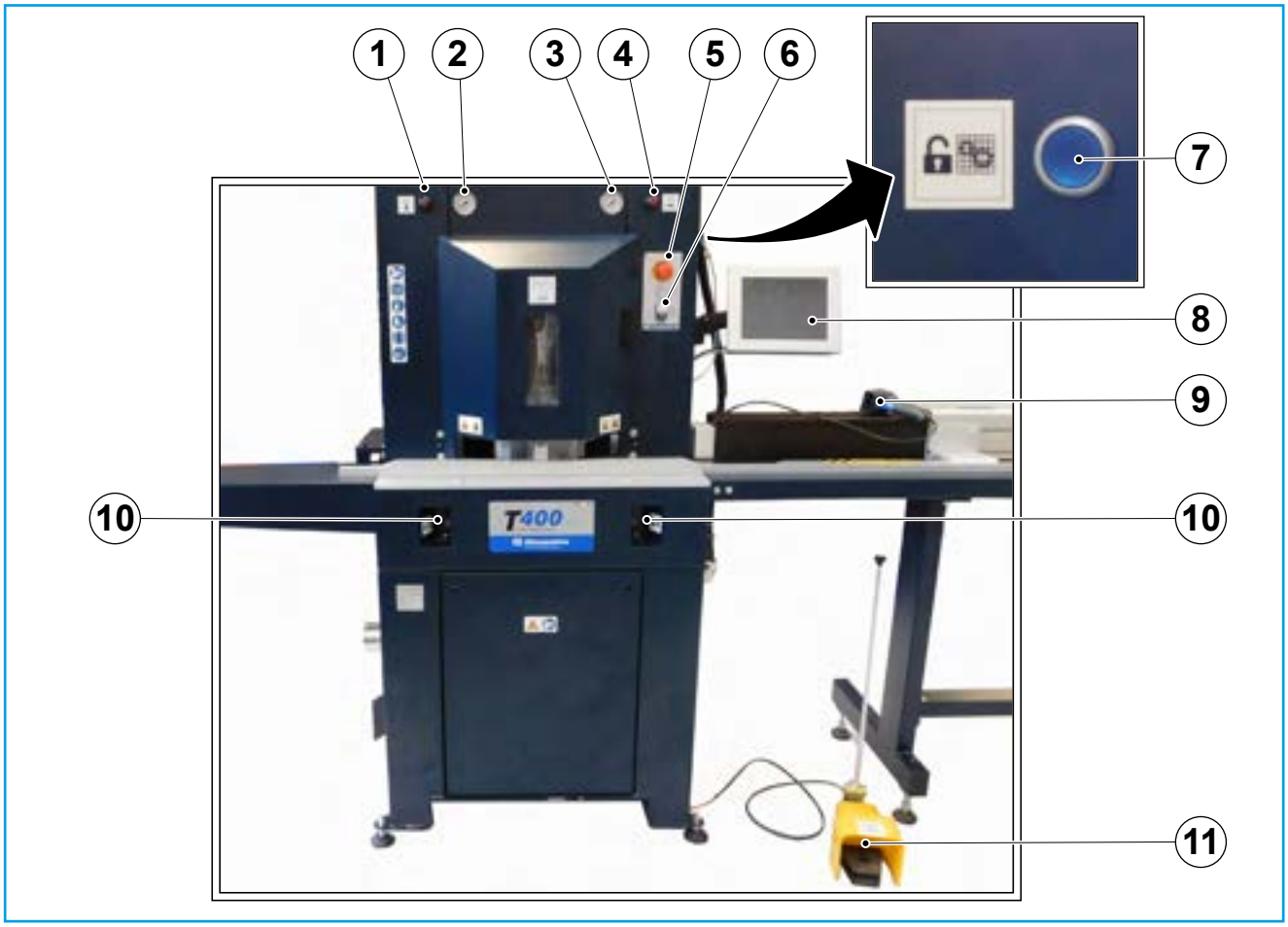


Figure 4 - 7

4.8.1. RS-232 programming port connection – optional

Functional description

The machine's command and control system includes an RS-232 serial port on a 9-pin female D-Sub connector, which can be used for:

- connecting a barcode reader with a serial interface.
- connecting the serial port (or USB-to-RS-232 converter) of a PC, using a crossover cable, to send the ASCII barcode string to the controller for creating the cutting program; the PC must send the ASCII characters corresponding to the barcode to be emulated + end-of-line character (0x0A) and/or return (0x0D). Ex: "Barcode Text" + LF (+CR).
- setting the PC communication parameters: **9600-8-n-1.**
- enabling the COM2 serial port in the machine's control panel: **parameter "802 COM2CFG" = 1 (Bar)"**.

As with the USB barcode reader, debugging is also enabled for PC reception via the "Barcode" page on the operator panel.

Figure 4 - 8

4.9. OPERATING MODES

Types of operation

The machine has a single semi-automatic operating mode:

- The specifications of the workpiece can be set using the control panel;
- The work cycle and workpiece clamping devices are started by means of controls operated by the operator:
  - the operator clamps the workpiece using the pneumatic foot control;
  - the operator starts the cutting cycle using the two-hand controls.

4.10. MACHINE STOP AND RESET MODES

4.10.1. Stop modes

Types of stop

The machine has the following stop modes:
- Stop at the end of the cutting cycle.
- Voluntary stop.
- Emergency stop.

Type of stop	When it occurs
Stop at the end of the cutting cycle	Once the cutting cycle has been started, use the two-hand controls to bring the blades down onto the workpiece. Once the cutting phase is complete and the blades reach their end-of-stroke position (controlled by the dedicated sensor), they automatically return to their initial position and await the next command.
	 *NOTE* *The blades do not stop at the end of the cutting cycle. The blades stop when:* - the Blade Stop button (0) is pressed; - the emergency stop button is pressed; - *the motor overload circuit breaker trips;* - *there is no compressed air or the pressure is too low;* - *the guards are opened.*
Voluntary stop	- During the cutting blade activation/movement phase when one or both of the two-hand controls are released. - When the Blade Stop button (0) is pressed.
Emergency stop	By pressing the emergency stop button located on the machine, if situations arise that may be dangerous for operators, exposed persons and the machine itself, requiring immediate stoppage of the operating cycle.

4.10.2. Reset Modes

Types of reset

The machine has the following reset modes depending on the stop mode activated.

Type of stop	Stop at the end of the cutting cycle
Intervention	Once the cutting phase has been completed, the machine stops and awaits the next command from the operator.
Reset	After correctly positioning the workpiece on the work surface, a new cutting cycle can be started using the pneumatic control pedal and the two-hand controls.
	NOTE *If the blades were also stopped at the end of the cutting cycle, the Blade Start button (I) must be pressed before a new cutting cycle can commence.*

Type of stop	Voluntary stop
Intervention	Release one or both of the two-hand controls: the blades stop and the cutting unit returns to its initial rest position.
Reset	The operator can restart the cutting cycle using the two-hand controls.

Type of stop	Emergency stop
Intervention	Press the emergency stop button on the machine.
Reset	To restart the machine operating cycle after an emergency stop, proceed as follows: ● Rectify or remove the cause that required activation of the emergency stop button. ● Reset the emergency stop button by turning it clockwise. Make sure it returns up from the pressed position. ● Acquire and acknowledge the alarm signal on the operator panel. ● Make sure the operating cycle can resume safely.

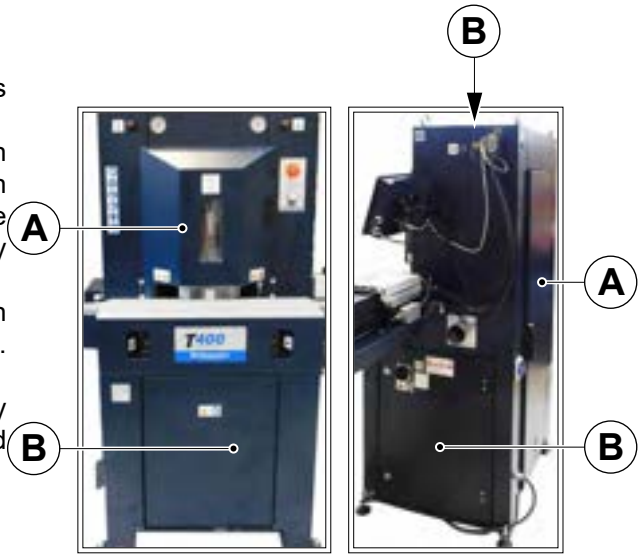
4.11. PROCEDURE FOR ACCESSING AREAS PROTECTED BY SAFETY GUARDS

Introduction

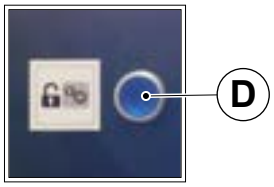
As shown in the example, the machine's danger zones are protected by:

- safety guards (A) controlled by an interlock microswitch, which can only be opened when the machine is powered and stopped in safety conditions;
- fixed safety guards (B), which can only be opened using specific tools.

To access areas protected by safety guards, follow the procedure described below.

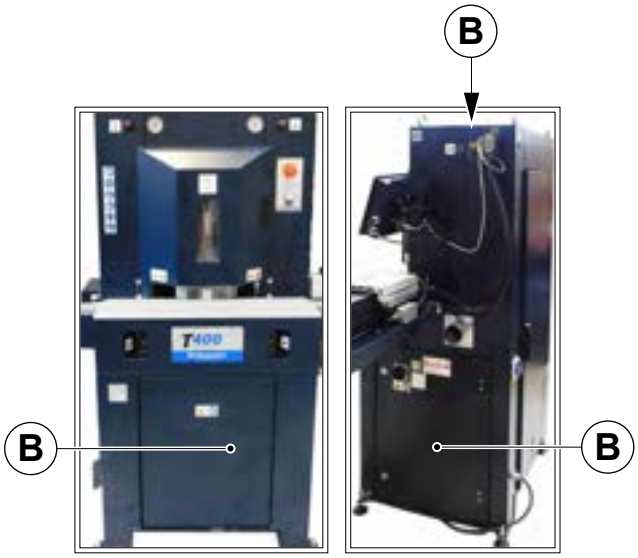


Procedure for accessing areas protected by safety guards (A) controlled by an interlock microswitch

Step	Description	
1	Press button (C) to stop the blades.	
2	Press button (D) to release the guards. *NOTE* *Pressing the button also raises the cutting zone automatic guard, thus allowing the front door to be opened completely.*	
3	Use handle (E) or (F) to open the relative guard.	

cont. ...

cont. ...

Procedure for accessing areas protected by safety guards (B)		
Step	**Description**	
1	Press button (C) to stop the blades.	
2	Using the specific tools provided, remove the fasteners on the guards (B) that need to be removed.	

Procedure for restoring safety conditions
Description
Close the guard controlled by the interlock microswitch, or replace and secure in place the removed fixed guard.

4.12. DESCRIPTION OF THE OPERATOR PANEL

Introduction

The operator panel is used to configure the various machine functions. It also reports any anomalies.
The following pages describe the standard functions of the operator panel, such as the display of current machine operating status and alarms, function selections, and the editing and display of operating parameters.

4.12.1. General functions

Functional description of the panel

The operator panel features a touchscreen interface. Functions are activated by pressing directly on the relative zone of the graphic display.
To edit numerical or alphanumeric fields, simply press the relative field on the display.

4.12.2. Login and Logout

General description

Press the  button (visible on all pages) and enter the password for the required level of authorization to access the service page.

Once on the service page, enter the password for the required level to access other machine configuration functions, such as:

- machine parameters;
- blade calibration;
- monitoring for diagnostic operations.

To log out, simply exit the password-protected pages and reset the current access level.

4.12.3. Description of main page controls

Introduction

The buttons, fields, and icons found on the supervision system's main page are described below.
The corresponding specific functions, associated with the various machine work phases, are described below.

Pos.	Description
1	Current date and time.
2	Name of current work program.
3	Indicates authorization to proceed status: • : access / operations authorized; • access / operations denied; the password **48018** must be entered to unlock the program so that changes can be made.
4	Frame selection button: • rectangular frame; • square frame.
5	Optimized cut selection button.

cont. ...

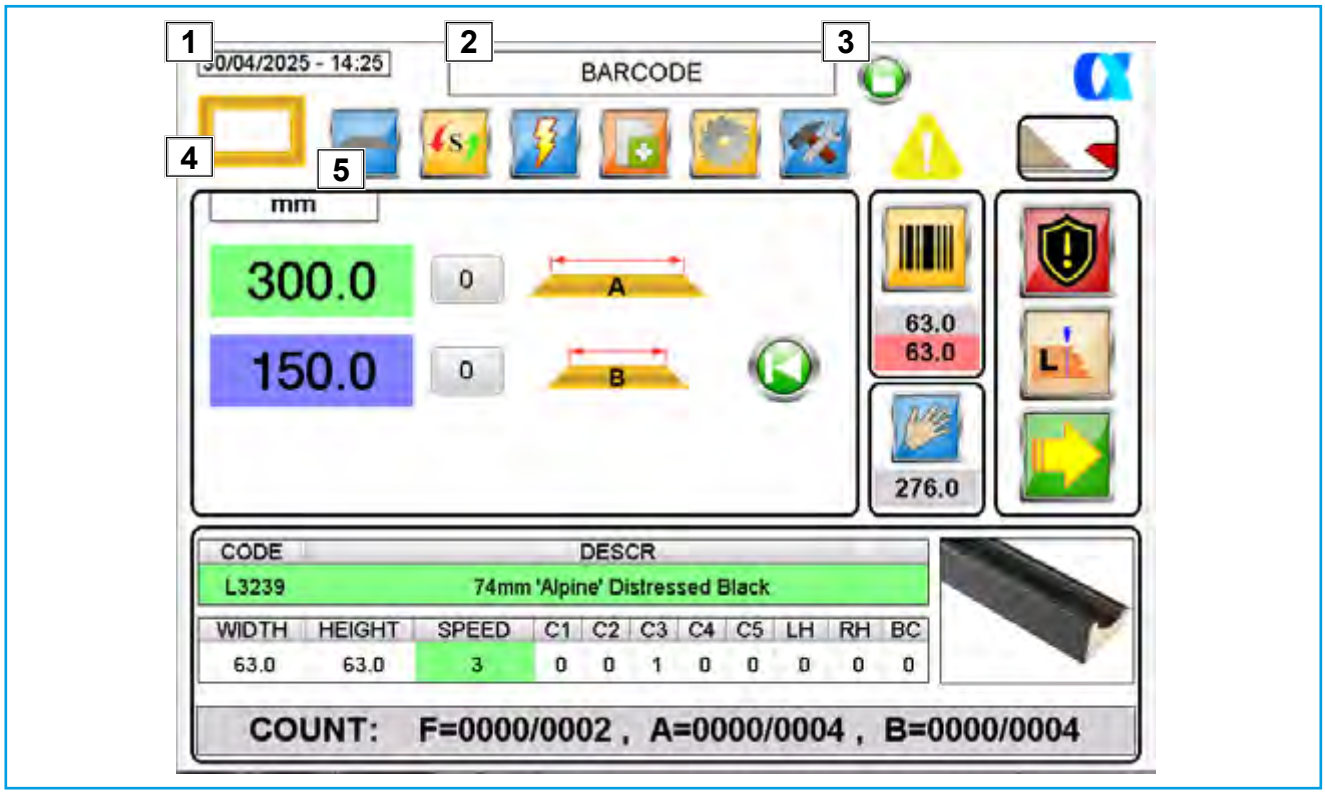


Figure 4 - 9

cont. ...

Pos.	Description
6	Modal "S" selection button for defining the cutting sequence when automatic movements are activated (not applicable in this version). "S" mode indicates standard operation, in which the operator selects the cutting sequence by manually controlling the positioning of the mobile stop.
7	Press this button to access a table of preloaded dimensions for quickly selecting the most frequently used cuts.
8	Button to access the information page on blade life and re-sharpening cycles.
9	Button to access the "Options and Settings" page.
10	Signalling icon indicating the presence of messages or alarms: • when lit up YELLOW, it indicates that a process phase has not been completed or an operation has not been performed; • when lit up RED, it indicates that a safety device involving the machine hardware has been tripped.
11	Moulding presence indicator.
12	Indicates the current overcut parameter (A): use the adjacent numeric button to set the required value.
13	Indicates the current overcut parameter (B): use the adjacent numeric button to set the required value.
14	Moulding width acquisition button. This button changes in appearance depending on whether the parameter is taken from measurements or uploaded using a barcode. When two values are displayed, the coloured field is to be considered active, not the grey one. The numerical fields below indicate the moulding width parameter reference.

cont. ...

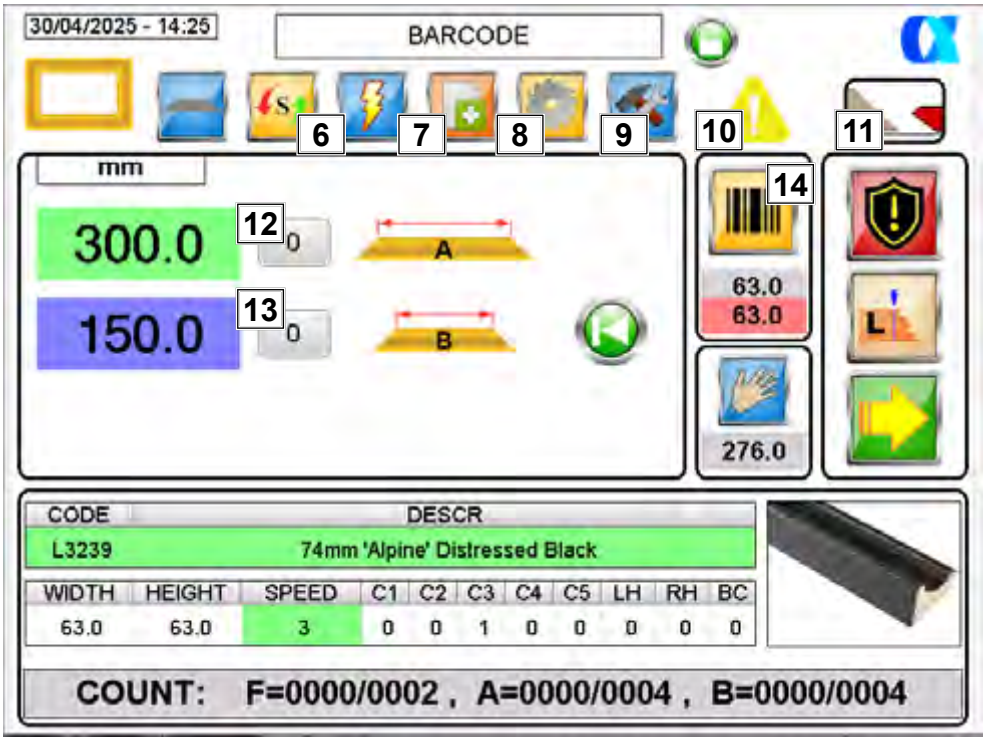


Figure 4 - 10

cont. ...

Pos.	Description
15	Indicates the current status of the operating area guard:  guard adjustment required.  guard open.  guard adjusted successfully, cutting operations can proceed.  This icon appears to indicate that the blades are rotating or that there is no compressed air.
16	Press this button to command the positioner to instantly set the cutting length and manual movement.
17	These fields indicate the code, description and technical characteristics of the workpiece being processed.
18	These fields indicate the mitre saw configuration parameters. ● Cutting width (expressed in mm or inches). ● Cutting height (expressed in mm or inches). ● Field for selecting blade unit descent speed: from 1 to 10. ● (C1/C2/C3/C4/C5) - fields for selecting the vertical clamping devices: - “0” = device DISABLED; - “1” = device SELECTED. ● (RH/LH) - fields for enabling/disabling the vertical clamping devices (left and right): - “1” = device ENABLED; - “0” = device DISABLED. ● (BC): Field for enabling/disabling the blade cooling system: - “1” = system ENABLED; - “0” = system DISABLED.

cont. ...

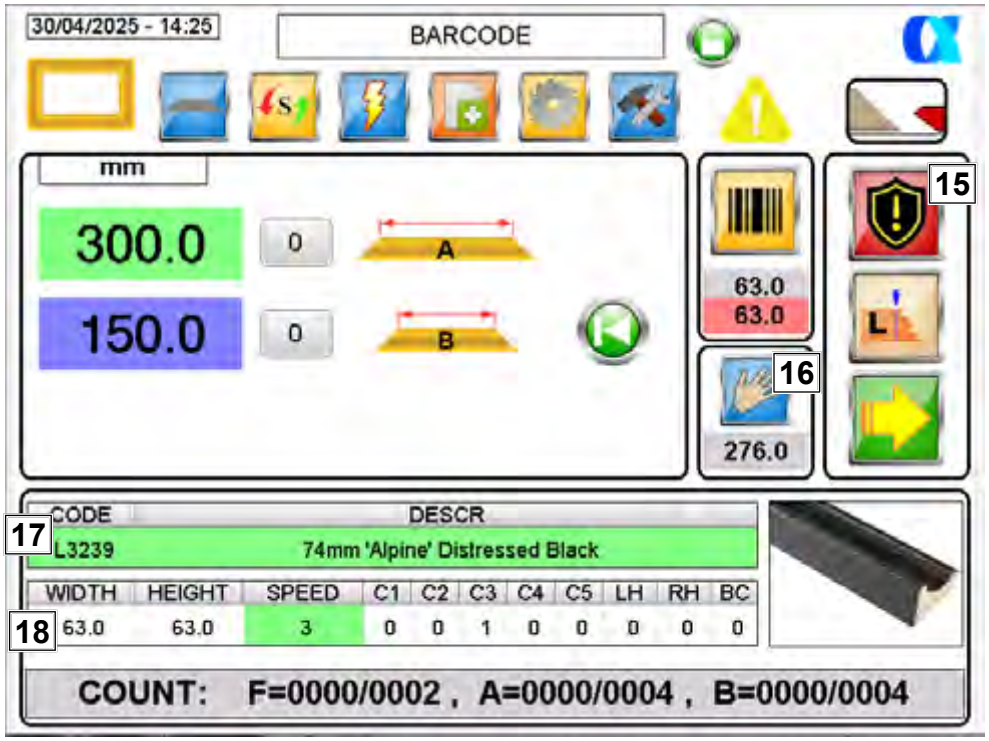


Figure 4 - 11

cont. ...

Pos.	Description
19	Processed workpiece counters display and setup area.
20	This window displays the image of the moulding currently being processed (uploaded in the system).
21	Trim cut option:  Icon not selected. The machine is ready to activate the left and right horizontal clamping devices according to the selection set in the machine settings table.  Icon selected for left "L" trim cut. When this icon is pressed, the machine prepares to deactivate the horizontal clamping device on the right-hand side of the blade, ignoring the program set in the machine settings table.  Icon selected for right "R" trim cut. When this icon is pressed, the machine prepares to deactivate the horizontal clamping device on the left-hand side of the blade, ignoring the program set in the machine settings table.
22	Stop Offset Option: After selecting the workpiece and commanding the positioning of the mobile stop, this icon appears if the external dimension of the workpiece to be cut is below the offset value.

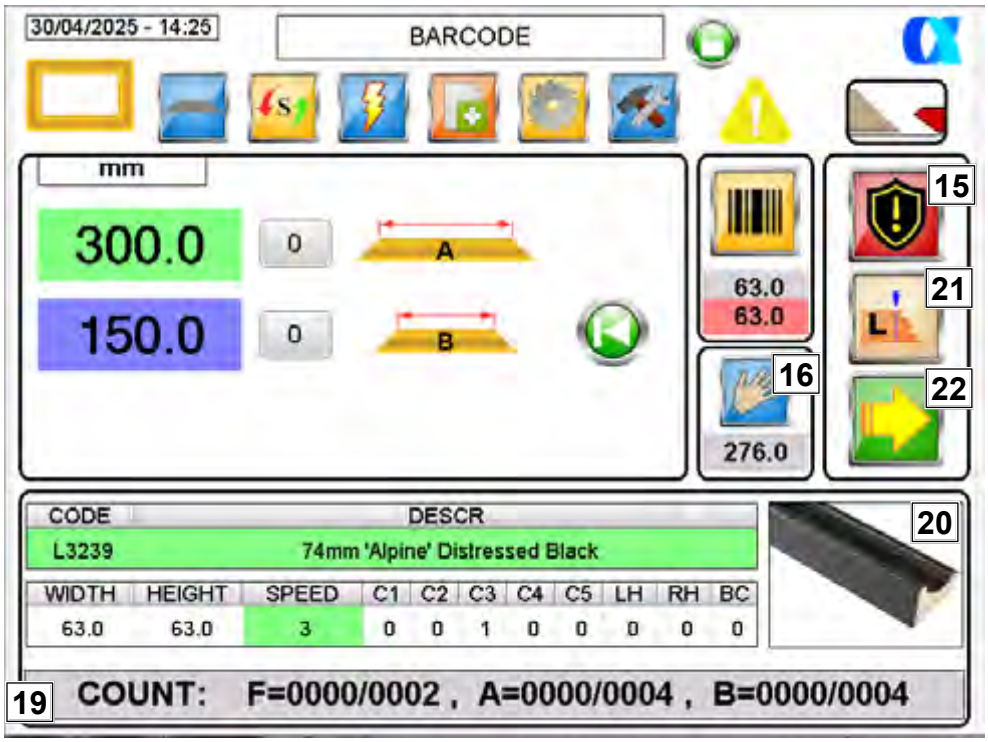


Figure 4 - 12

4.13. MAKING ADJUSTMENTS

4.13.1. Cutting zone safety guard adjustment

Functional description

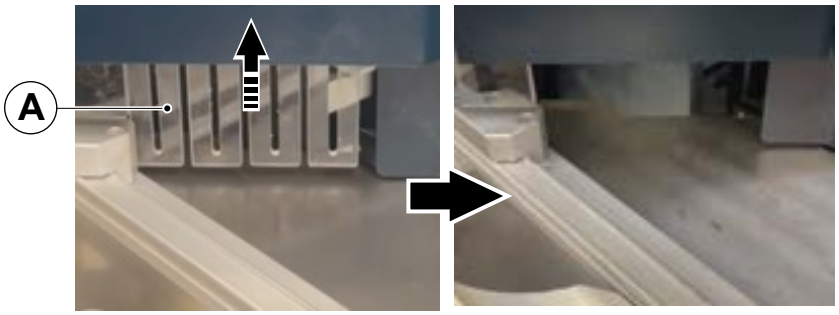
The cutting zone access area is delimited by a series of vertically sliding slats, the position of which must be adjusted based on the shape of the moulding transiting over the cutting surface.

When to make adjustments

Each time the moulding being processed is changed, or following maintenance operations, this guard must be correctly adjusted/positioned. If this is not done, the machine control system will inhibit operation.

NOTE
If the guard is not correctly adjusted, all cutting operations will be disabled: the blades will be stopped and the cutting unit will not descend.

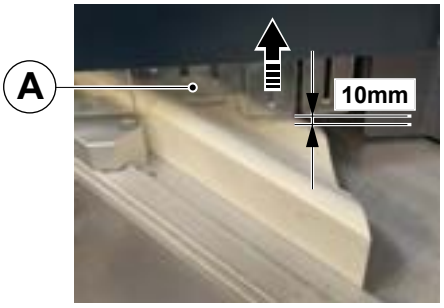
Operating procedure

Step	Description
1	If this icon  appears on the screen, it means that there is no compressed air or that the blades are rotating; in this case, the shape learning command is disabled: ● Stop the blades.
2	When the blades have come to a complete standstill, i.e., when the blade stop time has elapsed, the  icon appears. Press the icon to start the guard adjustment sequence. The slats (A) lift up for the guard opening phase.
	

cont. ...

cont. ...

Operating procedure

Step	Description	
3	When the guard is fully open, the  icon appears. Place the moulding (B) on the cutting surface and slide it through the cutting zone, keeping it tight up against the guide (C).	
4	Press the  icon to activate shape learning: the slats (A) come down until they touch the surface of the moulding.	
5	Once they come into contact with the surface of the moulding, the slats (A) lift up approximately 10 mm to allow freedom of movement.	
6	When the adjustment procedure has been completed, the  icon appears, indicating that the guard has been adjusted successfully and cutting operations can commence.	

4.13.2. Setting the vertical moulding clamping system

Functional description

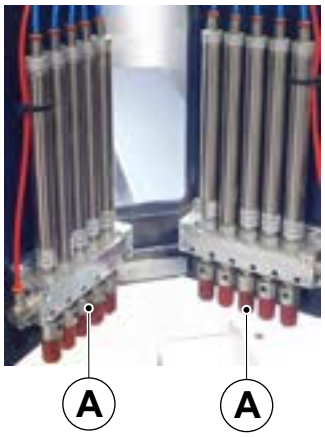
This system consists of five pressers for each blade. They are individually controlled by their respective pneumatic cylinders.

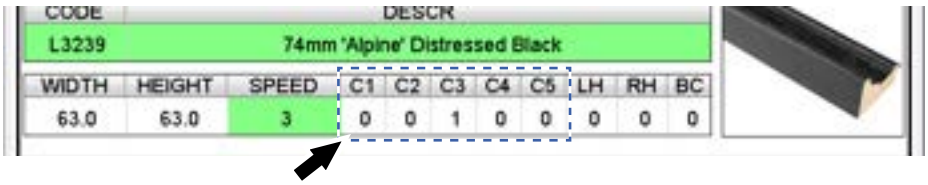
Purpose of the setup procedure

Depending on the moulding profile, one or more pressers must be enabled in positions that make sure the workpiece is correctly clamped on the cutting surface.

CAUTION
When selecting the pressers, always take into consideration the presence of the horizontal clamping system to avoid any collisions with unused pressers.

Operating procedure

Description	
Selection of the pressers (A) must be set in the machine configuration table. The pressers are indicated in columns C1-C2-C3-C4-C5. • Set the value on 0 to deactivate the presser. • Set the value on 1 to activate the presser.	



CODE	DESCR										
L3239	74mm 'Alpine' Distressed Black										
WIDTH	HEIGHT	SPEED	C1	C2	C3	C4	C5	LH	RH	BC	
63.0	63.0	3	0	0	1	0	0	0	0	0	

NOTE
If no vertical presser is selected (all values = 0), the blade unit remains disabled and cuts cannot be performed.

4.13.3. Setting the horizontal moulding clamping system

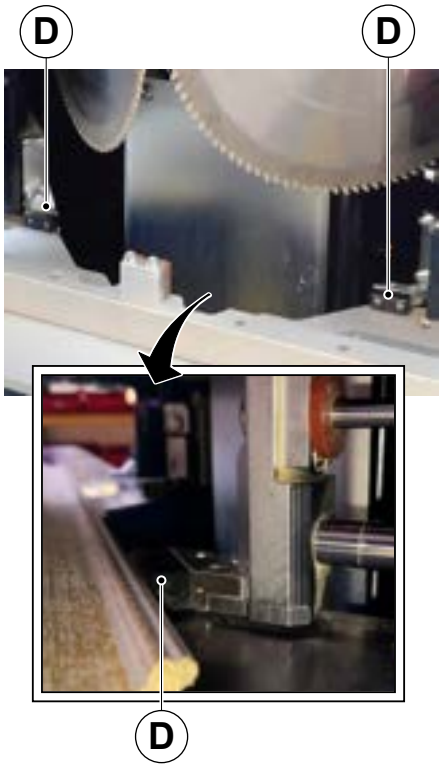
Functional description

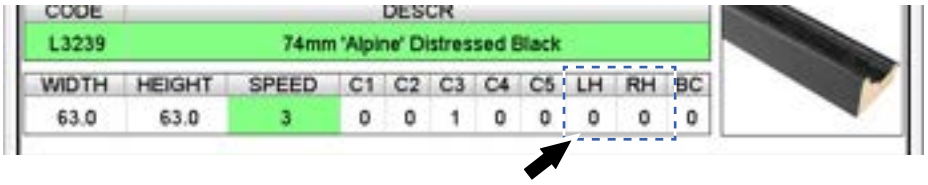
This system consists of two pressers (one for each blade) which press the moulding against the guide.

Purpose of the setup procedure

The pressers can be set independently according to the programming set in the machine configuration table. These pressers are indicated in columns LH and RH.

Operating procedure

Description	
Selection of the pressers (D) must be set in the machine configuration table. The pressers are indicated in columns LH and RH. • Set the value on 0 to deactivate the presser. • Set the value on 1 to activate the presser.	



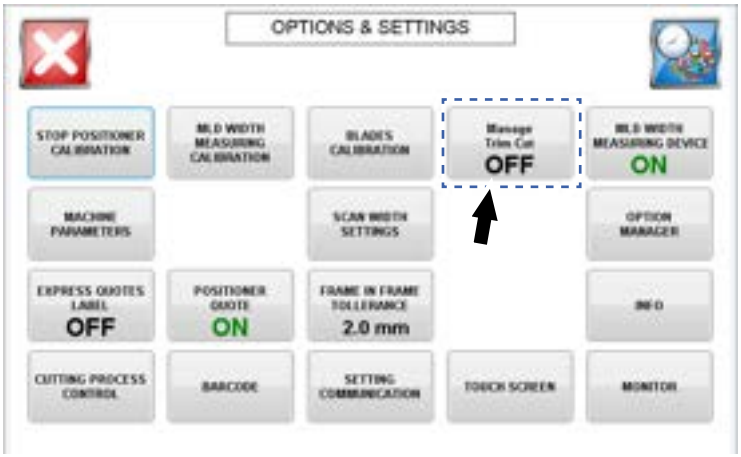
4.13.4. Moulding trim cut setup

Purpose of the setup procedure

When the moulding trim cut is executed, the workpiece may not be intercepted by the clamps on the right hand side of the blade.

CAUTION
To avoid collisions between the horizontal and vertical clamping systems, it is advisable to activate the "Manage Trim Cut" option on the "OPTIONS and SETTINGS" page.

Operating procedure

Step	Description
1	On the main page, press the  button to access the "Options and Settings" page: - Then set the "Manage Trim Cut" function. 
2	• If  = the trim cut icon is not displayed on the screen and both the left and right horizontal clamps are activated as programmed in the machine settings table. • If  = the moulding trim cut can be managed as required by pressing the icon that appears on the main page of the cutting program. Activating the trim cut icon prevents any interference between the vertical clamps and the horizontal clamps when the moulding is not intercepted by clamps.  Icon not selected: the machine is ready to activate the left and right horizontal clamping devices according to the selection set in the machine settings table.  Icon selected for left "L" trim cut: when this icon is pressed, the machine prepares to deactivate the horizontal clamping device on the right-hand side of the blade, ignoring the program set in the machine settings table.  Icon selected for right "R" trim cut: when this icon is pressed, the machine prepares to deactivate the horizontal clamping device on the left-hand side of the blade, ignoring the program set in the machine settings table.

cont. ...

cont. ...

Operating procedure

Step	Description
3	The standard machine, with moulding insertion from the left and mobile stop on the right, proposes the left trim cut by default and displays the  icon on the screen. If a right trim cut needs to be executed on the tail end of the moulding, press and hold the icon for 1 second until it switches to  . Selection of the  or  icon remains set until it is switched by pressing the icon for 1 second again.

Example of a trim cut:

 icon not selected:

- press the  icon to set clamping for a left trim cut;
- with the  icon selected, start the cutting cycle;
- the right-hand horizontal clamp is not activated;
- once the cut has been made, press the  icon again to reactivate operation of both horizontal clamps.

Example of a tail end trim cut:

 icon not selected:

- press and hold the  icon for 1 second;
- the icon switches to  to set clamping for a right trim cut;
- with the  icon selected, start the cutting cycle;
- the left-hand horizontal clamp is not activated;
- press the  icon again to deselect "tail end trim cut" and reactivate both horizontal clamps.

4.13.5. Clamping pressure adjustment

Functional description

The clamping pressure of the clamping systems is independent.
Each system can be adjusted using the corresponding pressure regulator.

Purpose of the adjustment

This adjustment is carried out to ensure that the position of each individual presser and the pressure applied on the moulding provide firm and stable clamping of the workpiece during cutting.

Operating procedure

Step	Description
1	Check the clamping pressure indicated on the pressure gauges (A) and (B).
2	Set the pressure by turning the regulators (C) and (D). ***CAUTION*** ***Avoid adjusting the pressure of the vertical clamping systems to a value lower than 2 bar (30 psi), i.e., lower than the minimum limit for allowing cutting unit descent.***

4.13.6. Blade unit descent speed adjustment

Functional description

The blade unit descent speed is regulated by an electronic flow regulator (A), located inside the front compartment of the machine. The speed value is saved in the machine configuration table.

Purpose of the adjustment procedure

This procedure is designed to adjust the blade unit's descent speed based on the hardness of the material being cut.

CAUTION
After changing the speed, it is always advisable to:
- ***check the "adjustment completed" status;***
- ***run a blade unit descent cycle without a workpiece in order to adjust the pneumatic circuit to the new value.***

Operating procedure

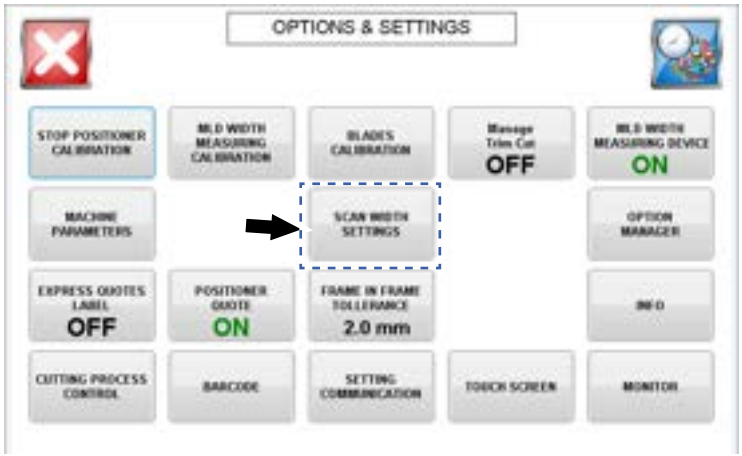
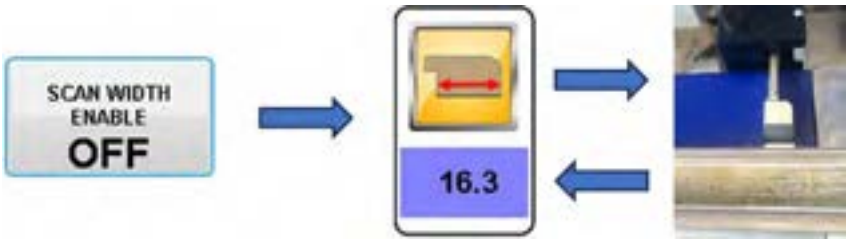
Description
NOTE - Types of flow regulator *Refer to machine parameter "612" relative to the device model installed on the machine to control the blade unit descent speed:* - Parameter 612 = Type (0): CKD component (ESC type). - Parameter 612 = Type (1): SMC component (standard).
 
Ten speeds are available from the lowest (1) to the highest (10) which the operator selects based on the hardness of the material being handled. The set values are saved in the machine parameters. The field in the table where the speed value is set changes colour depending on the flow regulator's operating status: ● Red: adjustment in progress or alarm ● Green: adjustment completed.


4.13.7. Moulding width measurement setting

Purpose of the setup procedure

This procedure defines how the moulding width data is used depending on whether or not the length correction system for the workpiece being cut is used, and based on the difference between the data set in the table and the measured width of the moulding.

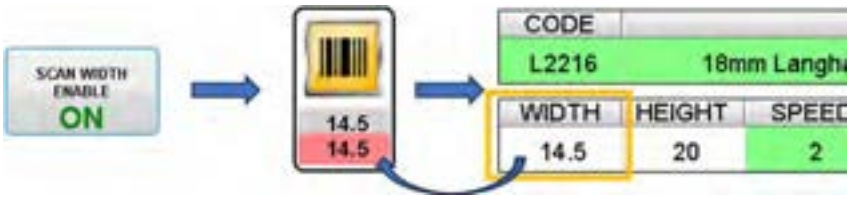
Operating procedure

Step	Description
1	On the main page, press the  button to access the "Options and Settings" page: - Then press the "SCAN WIDTH SETTINGS" button. 
2	 If this option is disabled, the moulding width data, set in the machine configuration table, is ignored by the cutting program and the length correction systems for the workpiece being cut are not used. The moulding width must be set or learned using the appropriate measuring device (see sequence below).  

cont. ...

cont. ...

Operating procedure

Step	Description	
3	 If this option is enabled, the moulding width data, set in the machine configuration table, is transferred to the cutting program and displayed below the measured value field. When the moulding code is entered manually, or uploaded by scanning a barcode to create the program, the measured value is forced to match the value in the table in order to avoid comparing the table value with the measurement of a previous moulding (see sequence below).	
		

4.13.8. Workpiece length correction settings

Purpose of the setup procedure

Once the "Scan Width Enable ON" option has been activated (see previous paragraph), the calculation comes into play to correct the programmed workpiece length based on the difference between the two moulding width reference values: WIDTH and MEASURED.

Description	
• **14.8**: this value represents the "MEASURED" width of the moulding. • **14.5**: this represents the value set for the "WIDTH" parameter in the machine configuration table.	

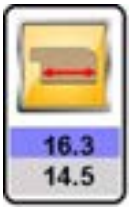
Operating procedure

Description
Measure the width of the moulding: The rule for applying correction takes into account these two machine parameters: • "Moulding Width Tolerance" • "Maximum Allowed Tolerance" - in order to obtain the following cases:

Case 1:
Correction is NOT applied

Description	
Moulding Width Tolerance The length of the workpiece being cut is not corrected if the difference between the table value and the measured value is less than or equal to the set tolerance value. The tolerance value is usually very small (e.g., 0.2 mm; 1/64").	
Example. • ABS (MEASURED – WIDTH) less than or equal to 1: - correction is NOT applied; - the program uses the value indicated in the table; - the icon indicates that the moulding width refers to the one uploaded by scanning the barcode.	

Case 2:
Automatic correction is applied

Description	
Max Toll. allowed Length correction for the workpiece being cut is automatically applied if the difference between the table value and the measured value is between the “Moulding Width Tolerance” parameter and the “Maximum Allowed Tolerance” parameter.	
Example. • ABS (MEASURED – WIDTH) between 1 and 5: - correction is applied; - the program uses the value indicated in the "MEASURED" field; - the icon indicates that the moulding width is the measured value.	

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Case 3:
Warning! Moulding error

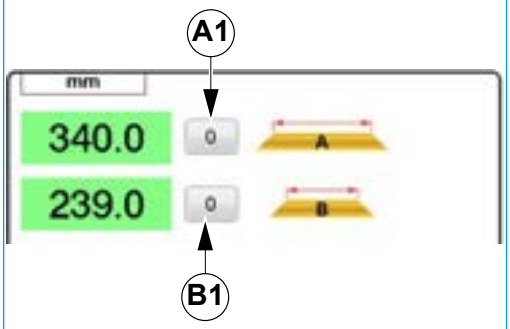
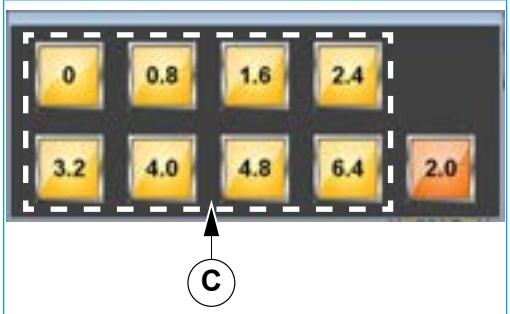
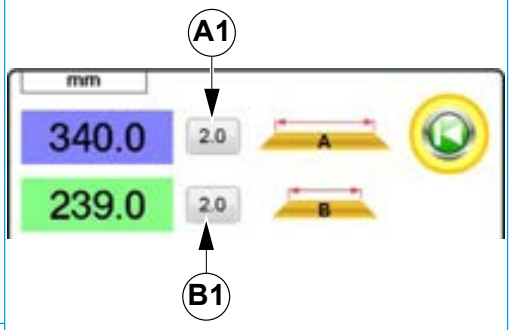
Description	
If the difference between the table value and the measured value exceeds the maximum allowed tolerance, ("Max Tol. allowed") the control system notifies the operator with an error message. The moulding measurement indicated in the table may be incorrect, or the operator may be using a moulding different to the one required.	
Example. ● ABS (MEASURED – WIDTH) greater than 5: - Automatic correction NOT applied; - error message appears when commanding the movement for the measurement to be cut.	
Request movement of the stop to the measurement of the selected workpiece.	
Error message "Moulding width out of Max.tolerance. Select:" on the screen. ● The operator can select whether to accept the measured moulding width or the width set in the table to which the scanned barcode refers, by selecting either the "MEASURED" or "BARCODE" button.	
	
If the operator confirms the measured width, the following window appears.	
● The program uses the value indicated in the "MEASURED" field. ● The icon (A) indicates that the moulding width is the measured value.	

4.13.9. Overcut function settings

Purpose of the setup procedure

Workpiece length overcut is a function that is programmed in the barcode for creating the cutting program (see the heading "Program setup with barcode").

Operating procedure

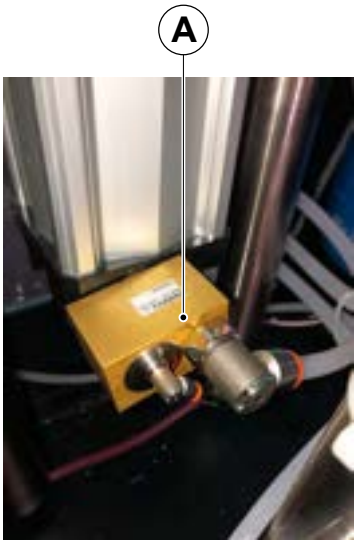
Description - Overcut NOT programmed	
If not programmed, the overcut can be set manually by the operator for each individual length "A" and "B", as follows:	
• On the main page, press either button (A1) or (B1) and hold for a few seconds to call up the page showing the overcut parameters table. • On the page that appears, select one of the Default values shown in window (C).	 
Description - Overcut PROGRAMMED	
If programmed, the same dimension is automatically assigned and added to the programmed lengths of workpieces "A" and "B":	
• On the main page, press one of the buttons (A1) or (B1); • On the page that appears, select the value for the custom overcut (D).	
NOTE *The overcut is typically used when programming internal measurements, for example, to facilitate glass insertion.*	

4.14. PREPARING FOR MACHINE OPERATION

4.14.1. Progressive machine start-up

Introduction

The blade unit's resting point is in the UP position. This position is held by the blocking valve (A) even in the absence of air and electricity as it prevents the air in the main cylinder from escaping.



If the blade unit is in the DOWN position

However, the blade unit may be in the DOWN position for any one of the following reasons:

- due to periods of inactivity;
- due to micro-leaks in the pneumatic system;
- intentionally left in the down position following maintenance work;
- for transporting the machine.

When the blade unit is in the DOWN position, at the first start-up of the mitre saw, the compressed air reintroduced into the system may thrust the blade unit violently upward.

Although this movement poses no risk to the operator, it can cause a sudden impact against the mechanical end stop.

To limit this phenomenon, at first start-up the machine uses a progressive start system that gradually increases the pressure in the pneumatic system, allowing the blade unit to reach its position slowly without any violent impact against the stop.

4.14.2. Blade calibration procedure

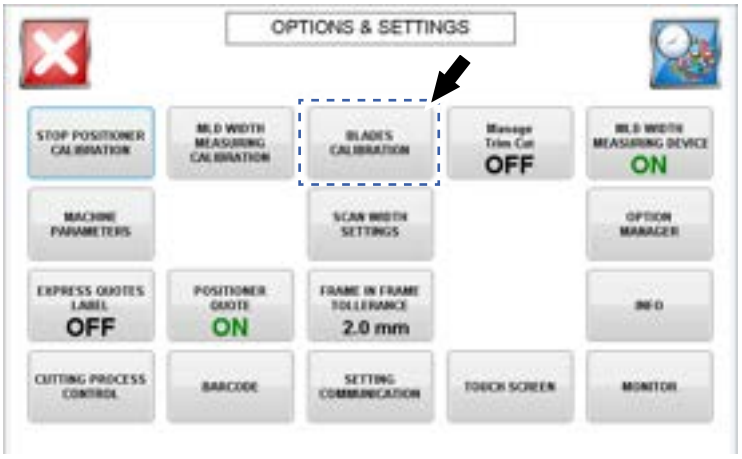
Introduction

The T400evo is delivered fully adjusted, consequently blade calibration after machine installation is not required.
This procedure should only be performed if extraordinary maintenance has been carried out on the cutting unit.

Authorized personnel

WARNING
Only authorized machine maintenance personnel have access to this function.

Operating procedure

Step	Description
1	On the main page, press the  button to access the "Options and Settings" page: - Then press the "BLADES CALIBRATION" button.
	NOTE *To access the blade calibration procedure page, a specific authorization code must be entered.*
	
2	Follow the instructions provided on the page to check and adjust the vertical alignment of the two blades. This page allows maintenance personnel to operate in total safety; however, maximum caution must still be exercised when making adjustments with the safety doors open, including when controlling the descent of the blade unit using the two-hand buttons. The blade unit descent speed is forced to "low." The mitre saw is in emergency status and the blade start command is disabled. The clamps can be activated by the pneumatic control pedal in accordance with the settings in the table.

cont. ...

cont. ...

Operating procedure

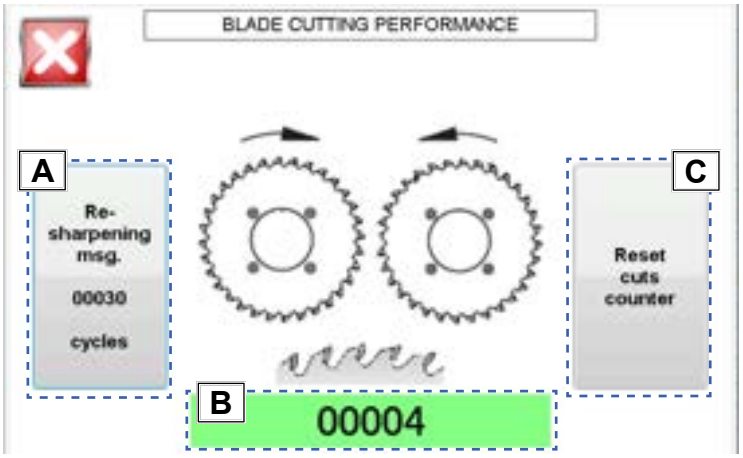
Step	Description
3	Follow the instructions provided on the "BLADES CALIBRATION" page to check and adjust the vertical movement of the two blades. This page allows maintenance personnel to operate in total safety; however, maximum caution must still be exercised when making adjustments with the safety doors open, especially when controlling the descent of the blade unit using the two-hand buttons. The blade unit descent speed is forced to "low." *NOTE* *The mitre saw is in emergency stop status and the blade start command is therefore disabled.* *The clamps can be activated using the pneumatic control pedal in accordance with the parameters set in the table.* ***CAUTION*** ***To avoid breaking its polycarbonate slats, always raise the cutting zone guard before opening the door to access the blades.*** 

4.14.3. Information on blade performance and resharpening cycles

General description

On the main page, press the  button to open the window displaying information on blade life and resharpening cycles.

Operating procedure

Description
On the main page, press the  button to access the "BLADE CUTTING PERFORMANCE" page: ● In the "Resharpening msg." field (A), set the number of control cycles for activating a blade resharpening or blade change alert message. ● If the number of cycles is set to 0, messaging is deactivated. ● Field (B) displays the progressive counter for cutting cycles performed. ● Press the button (C) to reset the cutting cycle counter.


4.14.4. Program setup with BARCODE

General description

Barcodes can be used to automatically create a cutting program for mouldings whose cutting dimensions are contained in the code itself.

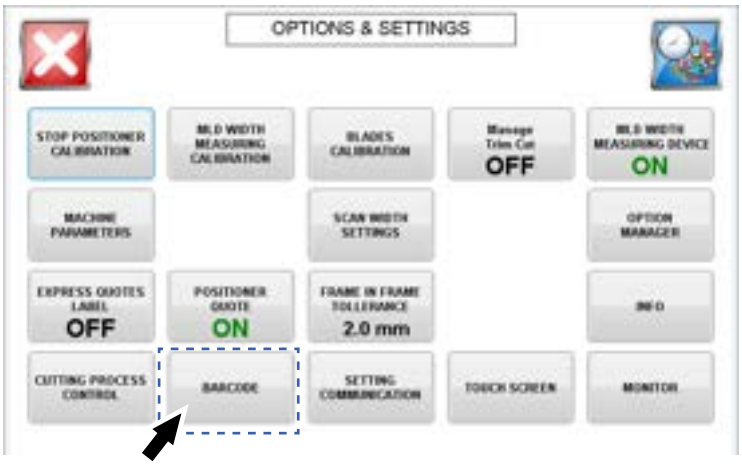
Barcodes are created remotely on a PC and are printed out in the format defined on the machine's control panel.

This means the user does not need to create a program or find one in the memory; he can simply scan the barcode to automatically create the program.

The barcode can include information about the moulding being processed (PROD. CODE), in order to retrieve the data needed to configure the mitre saw from the preset "MOULDINGS. csv" table.

It is important to configure the formatting of the barcode fields based on the maximum length of the characters used and the unit of measurement.

Operating procedure

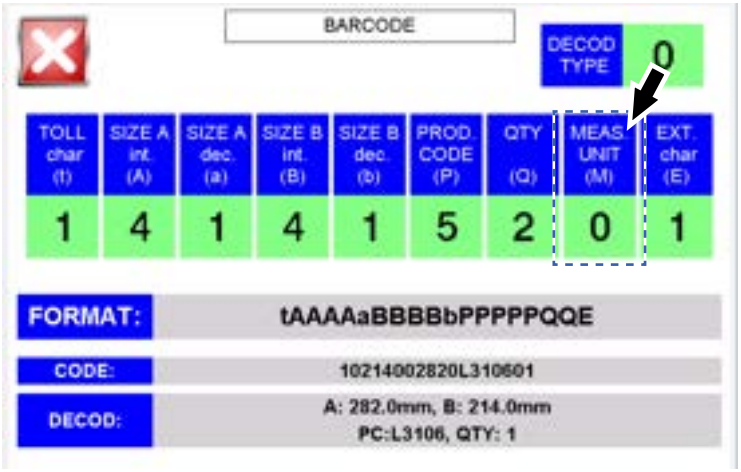
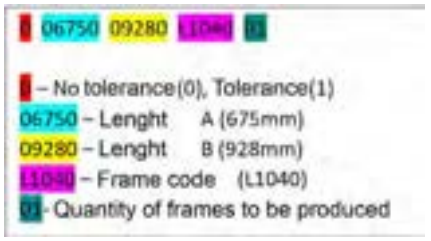
Step	Description
1	On the main page, press the  button and enter the code “47122” to access the ‘Options and Settings’ page: - Then press the ‘BARCODE’ button.
	

cont. ...

cont. ...

Operating procedure

Setting the barcode format for METRIC measurements

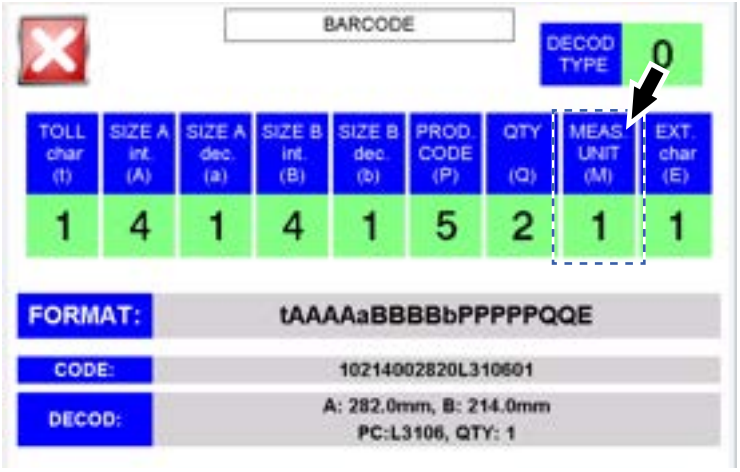
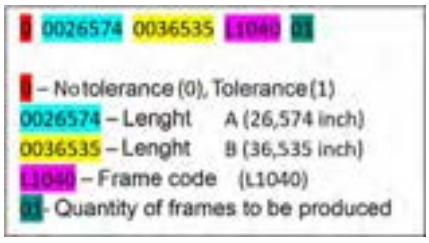
Step	Description
2	● On the barcode format setup page, tap any of the fields to define the number of characters used for the data. ● Set the “MEAS. UNIT” field to 0 to automatically recognize and convert the current unit of measurement specified by the last character of the code: - = 0 is for metric; - = 1 is for imperial. **Key:** - [TOLL] 1 character = use tolerance (0/1) - [SIDE A integer] 4 characters = Side A dimension, mm or inch - [SIDE A decimal] 1 character = Side A dimension, mm or inch (3) - [SIDE B integer] 4 characters = Side B dimension, mm or inch - [SIDE B decimal] 1 character = Side B dimension, mm or inch (3) - [PROD. CODE] 5 characters = moulding code (max 20 characters) - [Q.TY] 2 characters = quantity of mouldings to produce - [MEAS. UNIT] 1 character = Automatic recognition and conversion of the unit of measurement (0/1) - [EXT character (E)] 1 character = force external dimension (0/1)
	
	Example: ● Moulding code: L1040 ● Dimension: 675.0mm x 928.0mm ● Quantity: 1 ● Tolerance: No 
	

cont. ...

cont. ...

Operating procedure

Setting the barcode format for IMPERIAL measurements

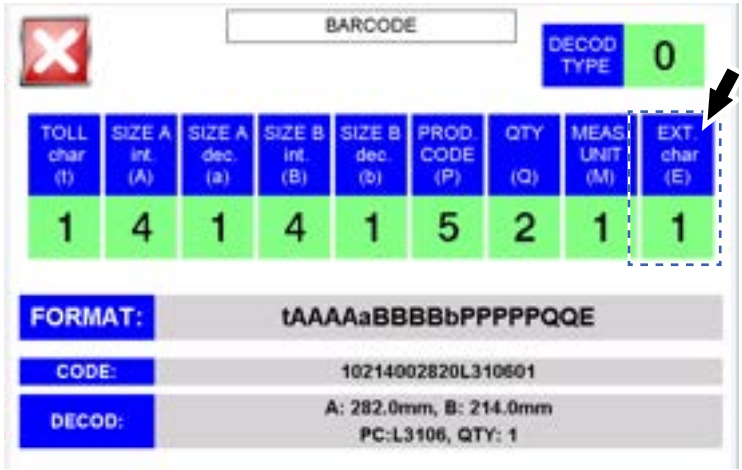
Step	Description
3	• On the barcode format setup page, tap any of the fields to define the number of characters used for the data. • Set the “MEAS. UNIT” field to 1 to automatically recognize and convert the current unit of measurement specified by the last character of the code: - = 0 is for metric; - = 1 is for imperial. **Key:** - [TOLL] 1 character = use tolerance (0/1) - [SIDE A integer] 4 characters = Side A dimension, mm or inch - [SIDE A decimal] 1 character = Side A dimension, mm or inch (3) - [SIDE B integer] 4 characters = Side B dimension, mm or inch - [SIDE B decimal] 1 character = Side B dimension, mm or inch (3) - [PROD. CODE] 5 characters = moulding code (max 20 characters) - [Q.TY] 2 characters = quantity of mouldings to produce - [MEAS. UNIT] 1 character = automatic recognition and conversion of the unit of measurement (0/1) - [EXT character (E)] 1 character = force external dimension (0/1)
	
	Example: • Moulding code: L1040 • Dimensions: 26.574 (inch) x 36.535 (inch) • Quantity: 1 • Tolerance: No 
	

cont. ...

cont. ...

Operating procedure

Setting the barcode format for EXTERNAL measurements

Step	Description
4	• Set the "EXT. char (E)" field to 1 to declare the measurements of sides A and B as external: - = 0; the data is ignored and the internal or external dimension is defined by the programmed moulding width measurement. - = 1; the programmed dimensions are EXTERNAL measurements. If this field is not present in the barcode, it is ignored and defaults to 0. **Key:** - [TOLL] 1 character = use tolerance (0/1) - [SIDE A integer] 4 characters = Side A dimension, mm or inch - [SIDE A decimal] 1 character = Side A dimension, mm or inch (3) - [SIDE B integer] 4 characters = Side B dimension, mm or inch - [SIDE B decimal] 1 character = Side B dimension, mm or inch (3) - [PROD. CODE] 5 characters = moulding code (max 20 characters) - [Q.TY] 2 characters = quantity of mouldings to produce - [MEAS. UNIT] 1 character = automatic recognition and conversion of the unit of measurement (0/1) - [EXT character (E)] 1 character = force external dimension (0/1)
	

4.14.5. Machine Configuration Table

Introduction

All the devices installed on the machine are connected to the electronic board that controls their operation.

Activation of these devices is automatic, but their different configurations depend on the shape and size of the moulding being cut.

Functional characteristics of the table

Machine functions are managed by an interactive table which can be used to assign a moulding reference code. This code can then be called up into the mobile stop's cutting program.

The cutting program can be created manually by the operator or automatically by scanning a barcode. In both cases, reference must be made to the moulding model being processed if the automatic mitre saw operations are to come into operation.

The moulding model is identified by a code, description, dimensions, and other information useful for its clamping.

All moulding models are saved in CSV format in a table called "MOULDINGS" and stored on the control system's internal SD memory card.

If available, the moulding code can be associated with an image for display on the screen: images must be in JPG format and 160x120 pixels in size.
In this case, images are not saved in the control system's internal memory but must be made available on a USB flash drive.

NOTE
The moulding code table and relative images are usually managed by the mouldings manufacturer or retailer, or by the user himself.
If the table is not provided, the control system will use the default "L0" moulding data as a reference, which can then be used by the operator to create a customized table.

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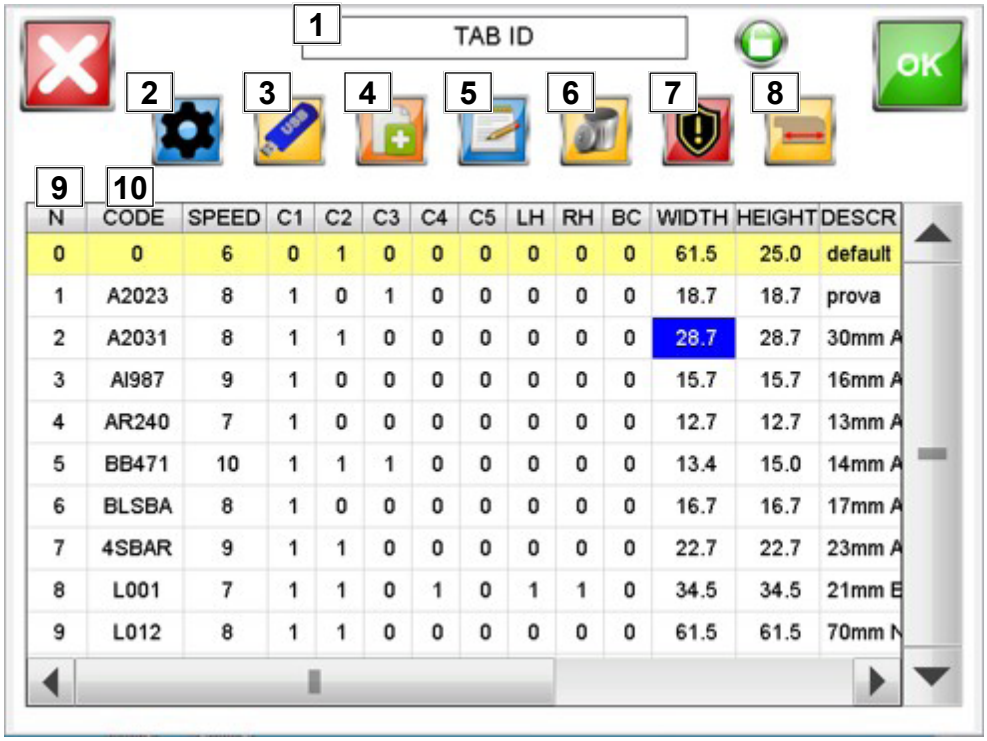
cont. ...

Description of the machine configuration table

Key:

1. "Find Code" search field
2. CSV table settings button.
3. "USB access" button.
4. "Add code" button.
5. "Edit table" button.
6. "Delete code" button.
7. "Safety guard adjustment" button.
8. "Width acquisition" button.
9. Row number column.
10. Moulding code column.



N	CODE	SPEED	C1	C2	C3	C4	C5	LH	RH	BC	WIDTH	HEIGHT	DESCR
0	0	6	0	1	0	0	0	0	0	0	61.5	25.0	default
1	A2023	8	1	0	1	0	0	0	0	0	18.7	18.7	prova
2	A2031	8	1	1	0	0	0	0	0	0	28.7	28.7	30mm A
3	AI987	9	1	0	0	0	0	0	0	0	15.7	15.7	16mm A
4	AR240	7	1	0	0	0	0	0	0	0	12.7	12.7	13mm A
5	BB471	10	1	1	1	0	0	0	0	0	13.4	15.0	14mm A
6	BLSBA	8	1	0	0	0	0	0	0	0	16.7	16.7	17mm A
7	4SBAR	9	1	1	0	0	0	0	0	0	22.7	22.7	23mm A
8	L001	7	1	1	0	1	0	1	1	0	34.5	34.5	21mm E
9	L012	8	1	1	0	0	0	0	0	0	61.5	61.5	70mm N

4.14.6. Importing/exporting the machine configuration table

Operating procedure

Step	Description
1	Access the table consultation page, located in the internal SD memory card.
2	• Check that the control system is reading the USB flash drive (figure A). • If the control system is not reading the USB flash drive (figure B), check that it is LINUX compatible, is inserted correctly and is not damaged. Replace if necessary.
3	  
4	Press the  button to access the file import/export page.  ***CAUTION*** ***Before importing a data table from a USB flash drive, check that the "SEPARATOR" character in the control system's CSV table format settings matches the formatting of the data file you wish to import.***
5	Press the  button to export the table from the SD card to the USB flash drive in CSV format. A new name can be assigned to the file.
6	Select a file and press the  button to import a table from the flash drive.

4.14.7. CSV table format settings

Operating procedure

Step	Description
1	On the table configuration page, press the button to open the table formatting page. Here it is possible to define the criteria for data column layout.
	CAUTION ***When importing/exporting CSV files, it is important to observe the same criteria.*** ***Reread and check the table from USB after changing the settings.***
	
	Example of a CSV file: - Mouldings,,,,,,,, - CODE, DESCR, WIDTH, HEIGHT, SPEED, VERT, HORIZ, REFRIG, - L001,21mm Bare Wood Ash,34.5,18,7,01011,11,0 - L012,70mm Napoli Antique gold leaf,0.0,0,0,00000,00,0 - L086,23mm Mono Matt Black FSC 100%,0.0,0,0,00000,00,0

4.14.8. Creating a data table on a PC

Introduction

When using a separator other than the default comma (","), this must be set in the CSV table format in the control system before importing the created file.

The created file must then be exported and saved as a CSV file.

NOTE
To preview the table to be imported in the control system, it is advisable to save the file with the default name MOULDINGS.csv.

Examples of tables

Example of a table with measurements in mm, created in EXCEL

	A	B	C	D	E	F	G	H
1	Mouldings.....							
2	CODE	DESCR	WIDTH	HEIGHT	SPEED	VERT	HORIZ	REFRIG
3	A2023	prova	18.7	25.4	8	00101	00	0
4	L001	21mm Bare Wood Ash	34.5	34.5	7	01011	11	0
5	L012	70mm Napoli Antique gold leaf	61.5	61.5	8	00011	00	0
6	L087	14mm Mono Matt Black FSC 100%	8.5	8.5	5	00001	00	0
7	L1165	28mm Auric Antique Gold Leaf	23.0	23.0	7	00011	00	0
8	L1195	34mm Auric Antique Silver Leaf	28.6	28.6	5	00000	11	0

Example of a table created with a text editor

```
Mouldings;;;;;;;;
CODE; DESCR; WIDTH; HEIGHT; SPEED; VERT; HORIZ; REFRIG;
A2023;prova;18.7;25.4;8;00101;0;0;
L001;21mm Bare Wood Ash;34.5;34.5;7;01011;11;0;
L012;70mm Napoli Antique gold leaf;61.5;61.5;8;00011;00;0;
L087;14mm Mono Matt Black FSC 100%; 8.5; 8.5;5;00001;00;0;
L1165;28mm Auric Antique Gold Leaf;23.0;23.0;7;00011;00;0;
L1195;34mm Auric Antique Silver Leaf;28.6;28.6;5;00000;11;0;
```

Example of a table with measurements in inches, created in EXCEL

	A	B	C	D	E	F	G	H
1	Mouldings.....							
2	CODE	DESCR	WIDTH	HEIGHT	SPEED	VERT	HORIZ	REFRIG
3	A2023	prova	0.736	0.736	8	00101	00	0
4	L001	21mm Bare Wood Ash	1.358	1.358	7	01011	11	0
5	L012	70mm Napoli Antique gold leaf	2.421	2.421	8	00011	00	0
6	L087	14mm Mono Matt Black FSC 100%	0.335	0.335	5	00001	00	0
7	L1165	28mm Auric Antique Gold Leaf	0.906	0.906	7	00011	00	0
8	L1195	34mm Auric Antique Silver Leaf	1.126	1.126	5	00000	11	0

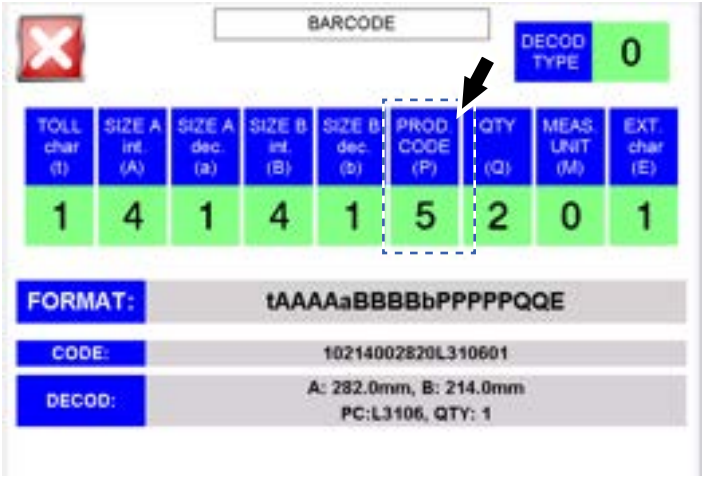
4.14.9. Setting the moulding "CODE" length

Purpose of the Setting

This setting defines the maximum number of characters (length) for the moulding codes entered in the CODE column.

The number of characters must be set in the "PROD.CODE (P)" datum for barcode formatting, as it is used for automatic program creation.

The maximum length is limited to 20 characters.



4.14.10. Moulding code data

Characteristics and display formats

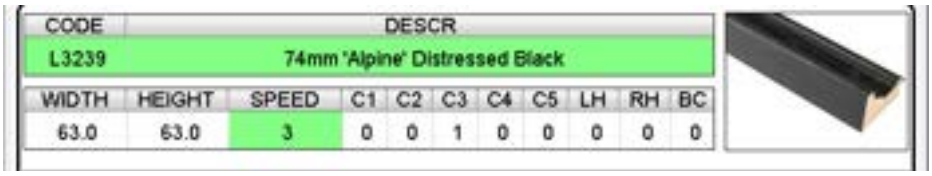
Text format for a table row, referring to the moulding being processed, saved in the .csv file:

L3123,20x13mm Domino Natural Open Grain FSC 100%,14.0,40,3,00001,00,0

Data of the moulding being processed imported from CSV file displayed in Excel:

Mouldings											
CODE	DESCR		WIDTH	HEIGHT	SPEED	VERT	HORIZ	REFINE			
L3123	20x13mm Domino Natural Open Grain FSC 100%		14.0	40	3	00001	00	0			

Display of the moulding data to which the cutting program refers and for which the machine has been setup:



CODE	DESCR									
L3239	74mm 'Alpine' Distressed Black									
WIDTH	HEIGHT	SPEED	C1	C2	C3	C4	C5	LH	RH	BC
63.0	63.0	3	0	0	1	0	0	0	0	0

4.14.11. Finding and changing the moulding code in the program

Operating procedure

Step	Description
1	Tap area (A) on the screen displaying the moulding code and description to open the alphanumerical keypad (B).
	
2	Using the alphanumerical keypad (B), type in the moulding code to be entered in the cutting program. If the moulding code is present in the table, it will replace the previous one and the mitre saw will get ready for the new moulding.
	

4.14.12. Consulting the table

Operating procedure

Step	Description
1	Tap area (C) on the screen displaying the data of the moulding currently being processed to access the table display page.
	
2	On the table display page (D), line (E) is highlighted as the moulding code currently being processed.
	

4.14.13. How to edit the table data

Operating procedure

Step	Description
1	Enter the password 48018.
2	On the table display page (F), select the field (G) to be edited and press the "EDIT" icon .
	
3	When the numerical or alphanumerical keypad (B) appears, enter the new value or text and confirm by pressing .
	NOTE *For all fields that only allow two possible values (0 and 1), simply tap the selected field again.*
	

4.14.14. Moulding width self-learning in the WIDTH field of the table

Introduction

The moulding width can be entered or edited using the EDIT command  or the self-learning function described below.

Operating procedure

Step	Description
1	On the table display page (F), select the "WIDTH" field (G) corresponding to the code of the moulding to be edited.
	
2	Position the moulding (K) to be measured on the work surface.
3	Press the "Width Acquisition" button  , or press the (P) button located on the on-board device, to acquire the measurement.
	

4.14.15. Setting the automatic moulding width control

Setup instructions

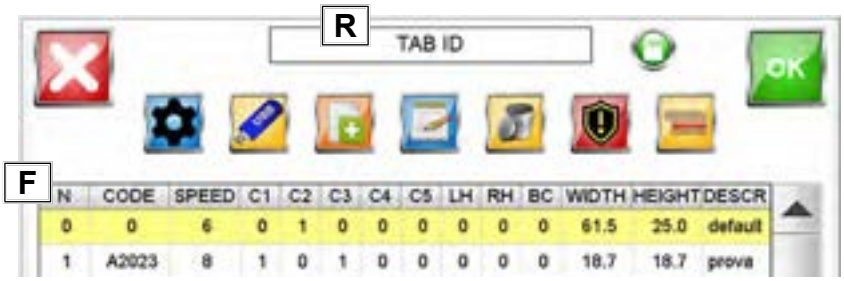
- Set parameter 137 "EN_AWDT" to manage automatic moulding width measuring.
- If = ON, a moulding width detection cycle is automatically performed at the end of the cutting zone safety guard adjustment procedure.

This combined procedure can only be performed on these pages:
- MAIN PROGRAM page
- EXPRESS page
- MANUAL page

Deactivate parameter 137 to disable this function:
- Parameter 137 = 0.

4.14.16. How to search for a moulding code in the table

How to execute a search

Step	Description
1	On the table display page (F), tap the "TAB ID" search field (R).
	
2	• Enter the moulding code using the numerical or alphanumerical keypad (B) and confirm by pressing  . • If the code is valid, the cursor will automatically move to the corresponding entry.
	

4.14.17. How to add a new moulding code to the table

Instructions

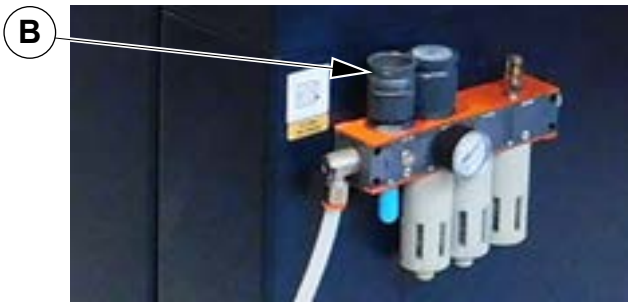
Step	Description
1	 Enter the password 48018.
2	On the table display page (F), press the  icon to create a new moulding code; "A2031" in the example shown.
	
3	When the numerical or alphanumerical keypad (B) appears, enter the new value or text and confirm by pressing  .
	
	NOTE *The table is positioned on the line of the newly created code. The data displayed is a copy of the default table (L0).* • Edit the data in the table according to the characteristics of the moulding. • Select the clamping devices and the blade unit descent speed. • Press the  button to exit the table and confirm the moulding code to be stored in the cutting program. • Press  to exit and return to the previous cutting program and moulding.

4.15. WORK PROCEDURES

4.15.1. Mobile stop calibration procedure

Introduction

After initial machine installation, before commencing work the mobile stop must be calibrated. Proceed as follows.

Step	Description
1	Turn the main power switch (A) to the "ON" or "I" position. 
2	Turn on the compressed air supply by acting on the padlockable valve (B) located on the air treatment unit. 
3	On the main page, press the  button and enter the password 47122 to access the 'Options and Settings' page: - Then press the "STOP POSITIONER CALIBRATION" button.
	

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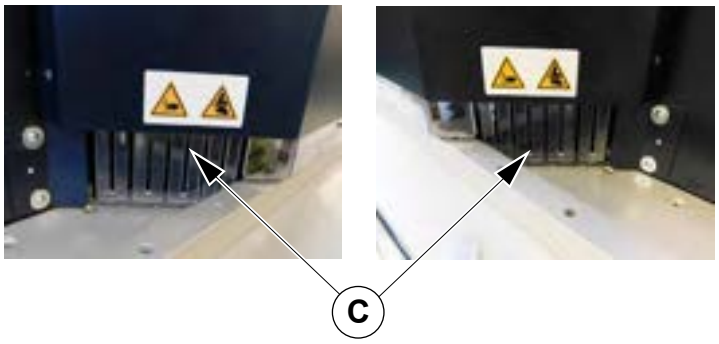
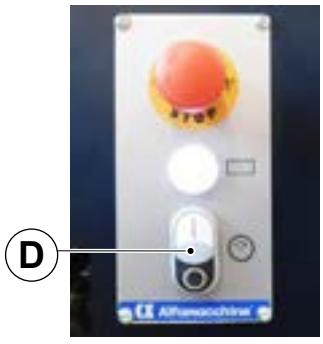
Step	Description	
4	On the "STOP POSITIONER CALIBRATION" page, press the mobile stop reset button (identified as step 1 on the screen).	
5	Press the  button (identified as step 2 on the screen) and adjust the blade safety guards (C), as described in heading "**4.12.1 "Cutting zone safety guard adjustment".**	 
6	Now cut a sample moulding/shape: • Switch the button (D) to "I" to start the blades.	

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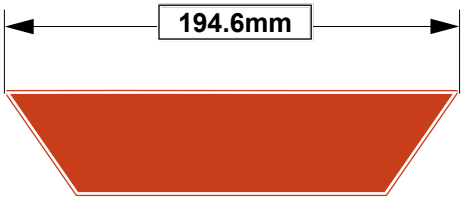
Step	Description	
7	Insert the sample moulding/shape into the cutting zone, then: ● Using the pneumatic pedal control (E), activate the selected vertical and horizontal clamping systems (see headings **"4.12.2 Setting the vertical moulding clamping system"** and **4.12.3 Setting the horizontal moulding clamping system")**. ● Using the two-hand controls (F), cut the sample moulding/shape.	
8	Confirm the cut by pressing the confirmation button (identified as step 3 on the screen).	
9	***CAUTION*** ***Measure the outside of the sample piece with maximum precision in order to avoid errors in the measurements of the workpieces to be cut.*** Accurately measure the outer profile of the sample/ moulding (identified as step 4 on the screen) The example in the figure shows the precise measurement of the sample piece = 194.6 mm.	 

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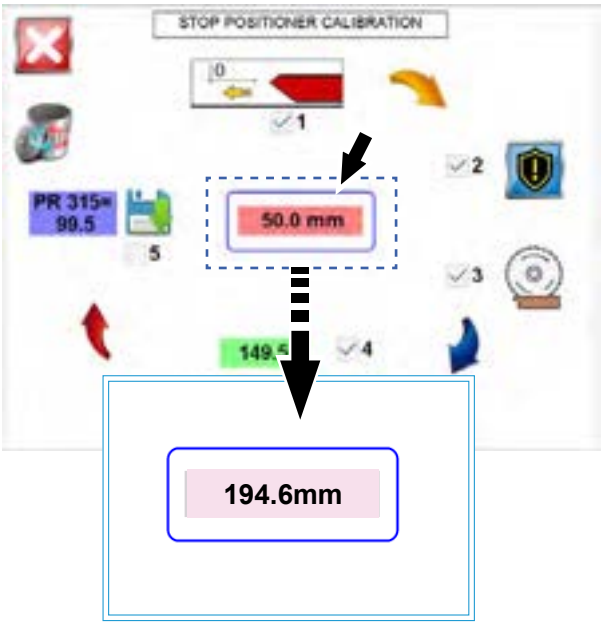
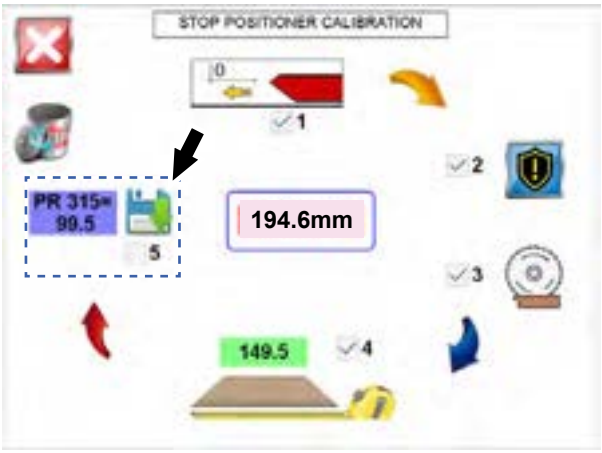
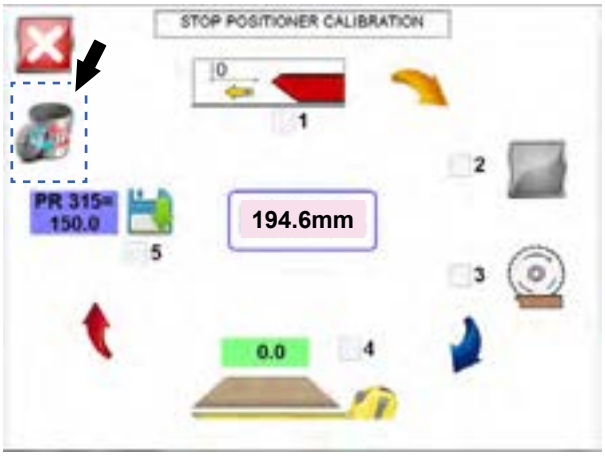
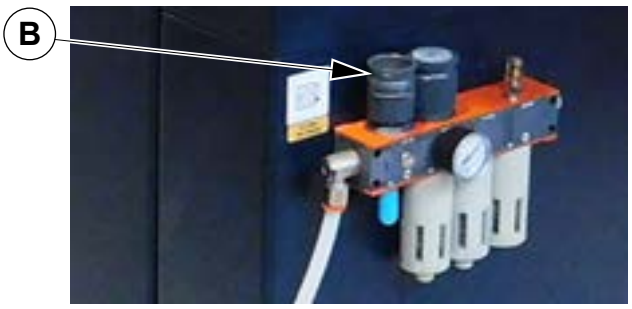
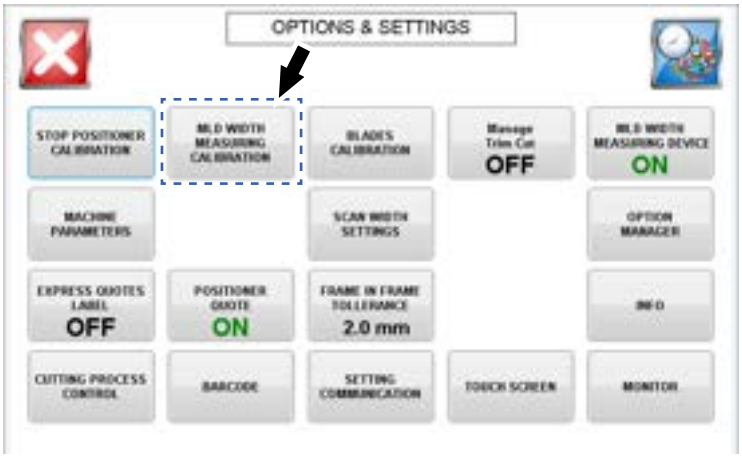
Step	Description	
10	Press the central field on the screen and, using the numerical keypad, enter the precise measurement of the sample piece (194.6 mm in the example shown in the figure).	
11	Save the measurement datum by pressing the  button (identified as step 5 on the screen).	
12	Press the  button to repeat the procedure.	

4.15.2. moulding width measurement calibration procedure

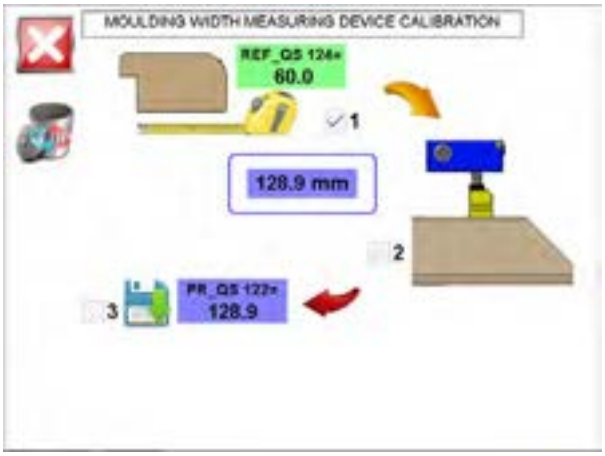
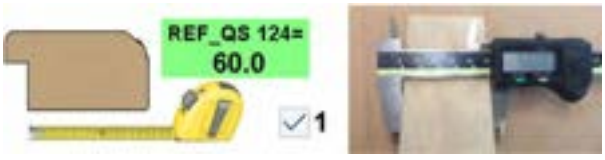
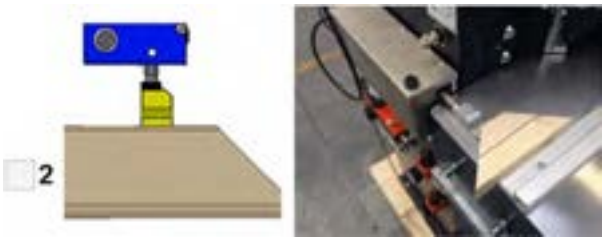
Introduction

Before commencing work, the moulding width measurement must be calibrated.
Proceed as follows.

Step	Description	
1	Turn the main power switch (A) to the "ON" or "I" position.	
2	Turn on the compressed air supply by acting on the padlockable valve (B) located on the air treatment unit.	
3	On the main page, press the  button and enter the password 47122 to access the 'Options and Settings' page: - Then press the "MLD WIDTH MEASURING CALIBRATION" button.	
		

cont. ...

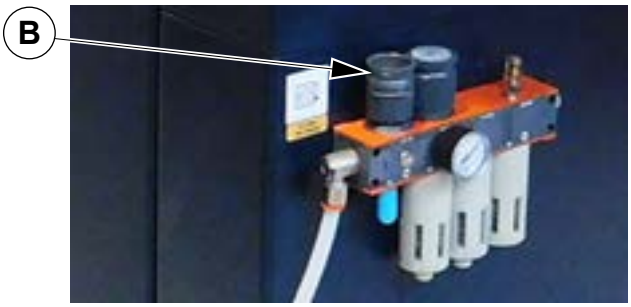
cont. ...

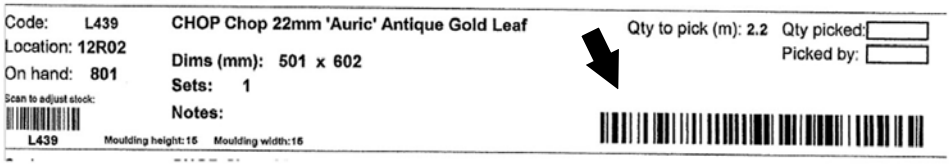
Step	Description	
4	Execute the procedure by following the steps indicated on the display page.	
5	Insert a sample piece of known size between the aluminium stop and the width measuring device. Enter the exact size of the workpiece to be measured using the numerical keypad.	
6	Press the  icon to move the measuring rod until it comes up against the sample piece. The sample pieces is measured during this step.	
7	Save the datum by pressing the  icon.	

4.16. COMMISSIONING AND FIRST START-UP

Introduction

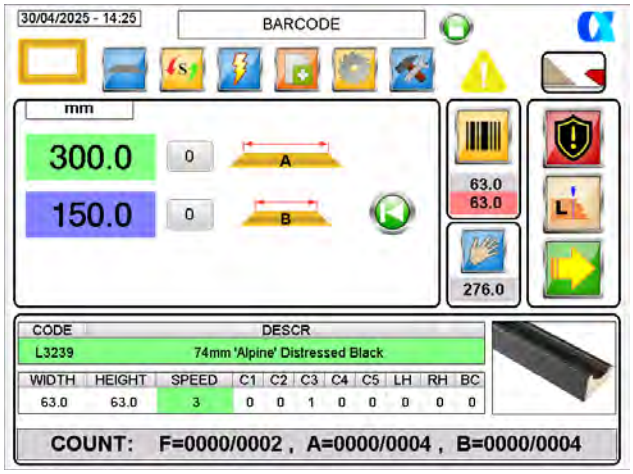
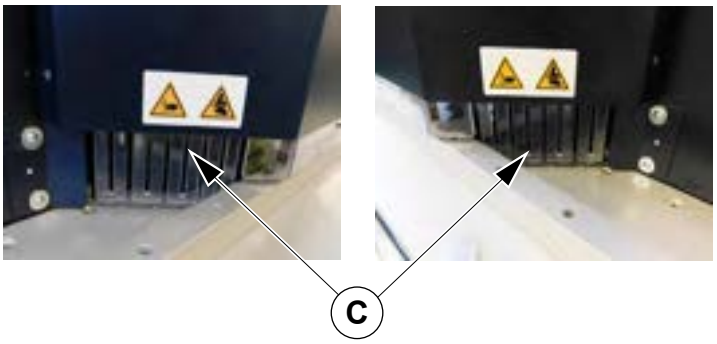
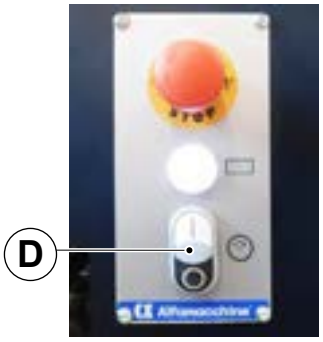
The general procedure for starting up the machine is illustrated below.

Step	Description
1	Turn the main power switch (A) to the "ON" or "I" position. 
2	Turn on the compressed air supply by acting on the padlockable valve (B) located on the air treatment unit. 
3	Prepare the work order using the relevant barcode for automatic program creation.
4	Make sure the blades are stopped. ***CAUTION*** ***Uploading a new program with the blades turned on is only permitted if the moulding code is the same as the one previously processed.***
5	Scan the barcode (see example below), or: - upload an existing program from the archive. or - Create a new program.



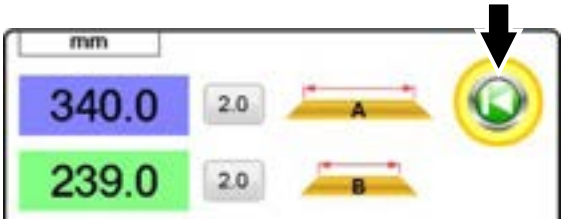
cont. ...

cont. ...

Step	Description	
6	The control system automatically creates the "BARCODE" program with the cutting data and sets the mitre saw parameters according to the moulding code data found in the table stored in memory (see example).	
7	Adjust the blade safety guards (C), as described in heading "**4.12.1 "Cutting zone safety guard adjustment".**	
8	If necessary, measure the width of the moulding to make sure it matches the value programmed in the table, as described in heading **"4.13.7 moulding width measurement setting".**	
9	Switch the button (D) to "I" to start the blades.	

cont. ...

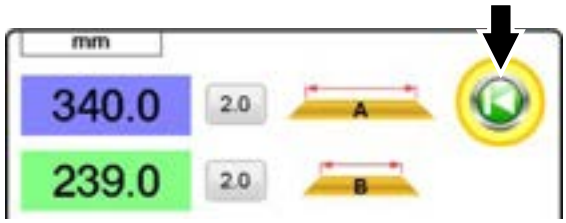
cont. ...

Step	Description	
10	Insert the moulding into the cutting zone, then: ● Using the pneumatic pedal control (E), activate the selected vertical and horizontal clamping systems (see headings **"4.12.2 Setting the vertical moulding clamping system"** and **4.12.3 Setting the horizontal moulding clamping system")**. ● Using the two-hand controls (F), execute a trim cut.	
11	On the main page of the supervision system, select the side to be cut and press the "PLAY" button  to position the mobile stop for the required measurement.	
12	Position the 45° cut of the moulding against the stop so that the sensor detects the workpiece.	
13	Repeat steps 11 and 12 until all the workpieces have been cut.	

4.16.1. Example of a cutting sequence

Introduction

An example of a typical cutting program sequence is illustrated below.

Step	Description	
1	Scan the barcode to create the cutting program.	
2	The number of mouldings to be produced is set by the barcode or can be set by the operator.	
3	Select the side to be cut, "A" or "B".	
4	Press the flashing "PLAY" button to position the mobile stop for the size of the selected workpiece.	
5	Insert the moulding.	
6	Select the trim cut icon .	
7	Start the cutting cycle.	
8	Deselect the trim cut icon .	
9	Push the moulding up against the mobile stop.	
10	Start the cutting cycle to cut the selected workpiece.	
11	The system acquires the cut workpiece count.	
12	Perform the offset movement if the workpiece is short.	
13	Remove the cut piece.	
14	Select the side to be cut and reposition the mobile stop.	
15	Repeat steps (9) to (14).	
16	If a tail end trim cut needs to be made, press and hold the trim cut icon for 1 second until it switches to .	

4.17. TROUBLESHOOTING, FAULTS AND ALARMS

4.17.1. Error “moulding code not found”

Error description and relative reset

If the moulding code is not in the table, the system displays an error message.

If this error message appears on the screen, the new program is not created and the last program used remains displayed.

To create the program the table must be updated with the new moulding code.

This function is controlled by the parameter "611" = 0.

By setting parameter "611" = 1, the program will be created with the new cutting dimensions, but the mitre saw settings remain the same as for the last moulding code executed.

4.17.2. Error “program change not permitted”

Error description and relative reset

NOTE
It is possible to change the program or create a new one using a barcode with the blades running, but only if the moulding code does not change.

If a program is scanned with a different moulding code from the one previously processed, the system signals the error by highlighting the "CODE" and "DESCRIPTION" fields of the current program in red for a few seconds, or by disabling the "OK" confirmation button in the list of saved programs.

To upload a new program with a different moulding code, stop the blades so the cutting zone guard can be safely repositioned.

4.17.3. "Stop not in position" error

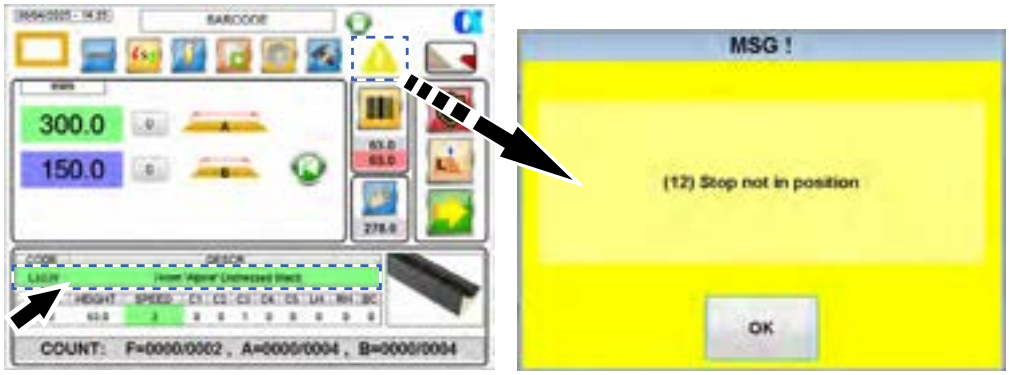
Error description and relative reset

To ensure that the cut is performed with the stop in the correct position, set parameter "610" = 1.

The cut will only be executed if one of the programmed workpieces "A" and "B" has been selected and the stop is positioned at the right distance.

If the pieces are not in position, the blade descent command will not function, and the system signals the problem by displaying a yellow triangle and relative message.

To bypass this control, set parameter 610 = 0.



4.17.4. Alarms

Introduction

The machine's electronic system detects the status of the safety devices and process sensors.

In the event of an anomaly, the control system alerts the operator with an on-screen notification, either a yellow warning triangle or a red alarm triangle.

YELLOW triangle: indicates that a process phase has not been completed or an operation has not been executed;

Examples:
- cutting zone safety guard learning not completed.
- position sensors not detecting workpiece.
- mobile stop not in required position.

RED triangle: indicates that a safety device involving the machine hardware has tripped.

Examples:
- doors open.
- the system has detected a drop in pneumatic system pressure.
- a circuit breaker has tripped due to motor overload.
- workpiece present during movement of the mobile stop.

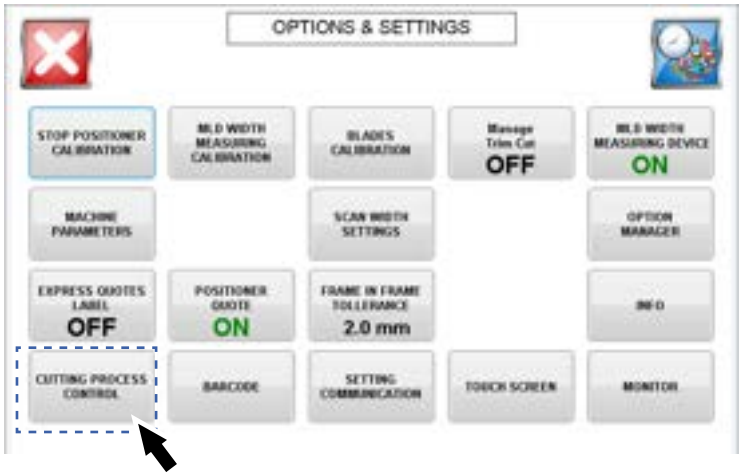
How to view the alarm message

When present, tap the triangle to open the message and view the causes that generated the alarm (see examples below).

4.18. WORKPIECE COUNTER MANAGEMENT

4.18.1. Workpiece counting procedure

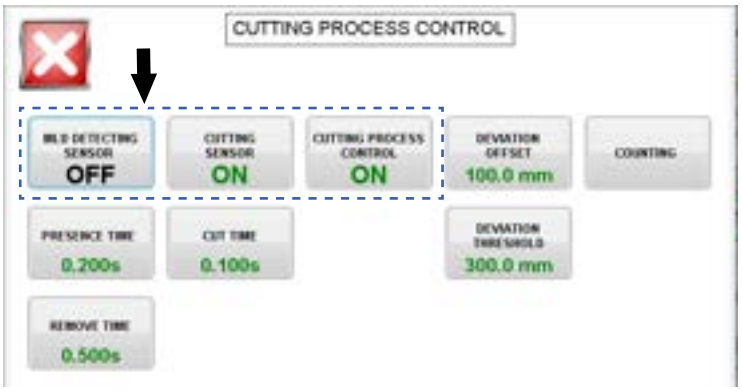
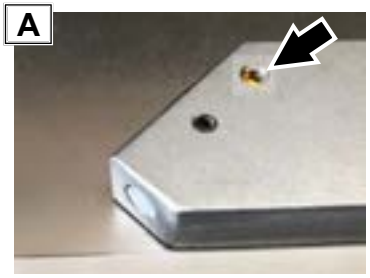
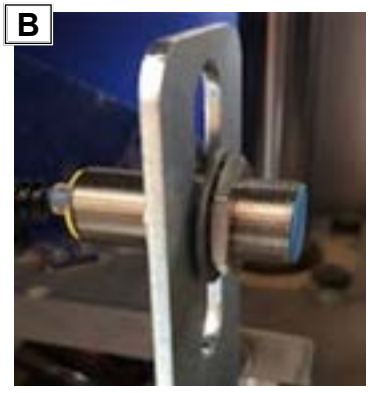
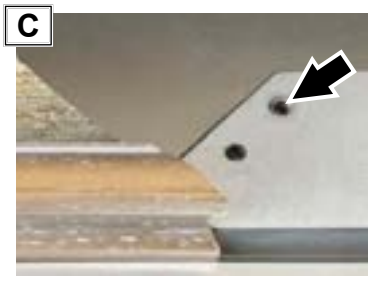
Instructions

Step	Description
1	On the main page, press the  button to access the "Options and Settings" page: - Then press the “CUTTING PROCESS CONTROL” button.
	

cont. ...

cont. ...

Instructions

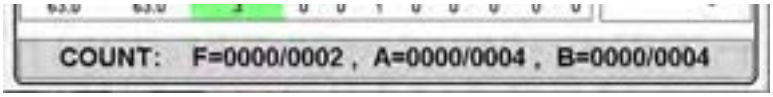
Step	Description
2	On the “CUTTING PROCESS CONTROL” page, set the three options that define the workpiece counter control hardware to “ON”.
	
	Figure (A): The workpiece presence sensor is NOT detecting the workpiece; the LED is on when the moulding is not up against the stop. (LED ON) 
	Figure (B): Cut executed sensor. This sensor is on when the blade unit is in the up position. 
	Figure (C): Detection of workpiece against the stop. The LED is off when the moulding is up against the stop. (LED OFF) 

NOTE
Minimum workpiece width detectable by sensor: 3mm

cont. ...

cont. ...

Instructions

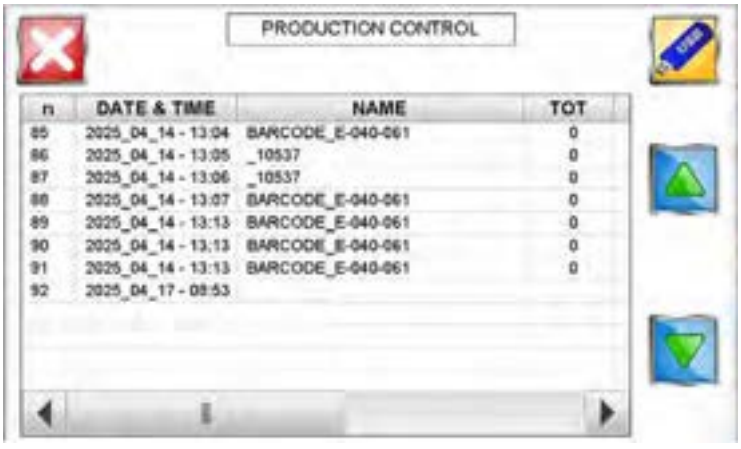
Step	Description
3	On the main page, select the workpiece to be cut "A" or "B".
4	Insert the moulding for cutting.
5	If a trim cut is needed, DO NOT push it up against the stop.
6	Execute the trim cut. Being as the moulding is not detected by the sensor, the workpiece count stays the same.
7	Push the 45° cut of the moulding up against the stop. If the sensor detects the moulding, the LED goes off.
8	Execute the cut. The blade unit automatically goes back up when the cut executed sensor is activated (blade down).
9	The workpiece count is incremented.
10	The "COUNT" area is updated after each cut.
11	Notification messages appear when the set workpiece count is reached. (See example below)
	
	CAUTION • ***Reading a barcode resets the workpiece counter.*** • ***Set parameter 190 = ON to disable counting complete messages.***

4.18.2. Production reports

Introduction

On the "CUTTING PROCESS CONTROL" page, press the "COUNTING" button to access the production data display page for the executed programs.

Instructions

Step	Description
1	On the "CUTTING PROCESS CONTROL" page, press the "COUNTING" button to access the "PRODUCTION CONTROL" page.
	
2	The production report can be exported onto a USB flash drive as a .csv file by pressing the  button.
	

4.18.3. Editing the number of mouldings to be produced

Instructions

- Tap the "COUNT" area to open the page for editing the number of mouldings to be produced.
- Tap the "REQ" button to edit the number of mouldings to be produced.

4.18.4. Editing the number of pieces produced

Instructions

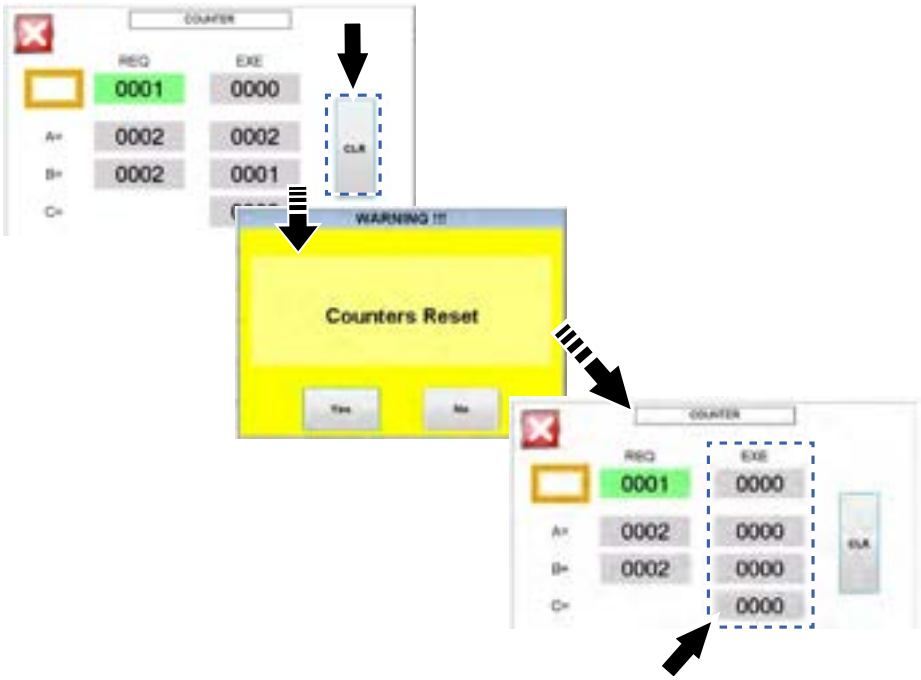
- Tap the "COUNT" area to open the page for editing the number of mouldings to be produced.
- Tap the "EXE" button and enter the password "2209".
- To edit the number of pieces produced, tap one of the fields in the "EXE" column.

4.18.5. Resetting the pieces produced count

Instructions

- Tap the "COUNT" area to open the page for editing the number of mouldings to be produced.

- To reset the piece count, simply scan the same moulding code again, or scan a new one.
- The counters can be reset on the "COUNTER" page by tapping the "CLR" button.
- Confirm the reset by pressing the "Yes" button, or cancel the operation by pressing the "NO" button.

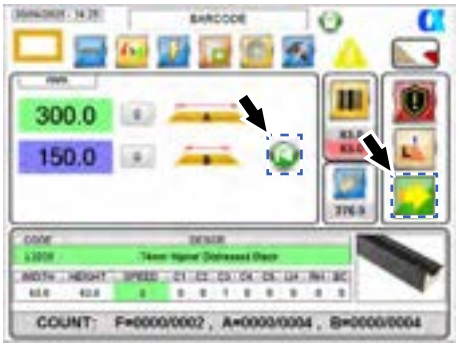


4.18.6. Procedure for setting up the stop offset option

Purpose of the setup procedure

The "stop offset" option is used to facilitate the removal of short pieces after cutting.
The offset procedure is activated automatically based on the parameters set on the "CUTTING PROCESS CONTROL" page.

Operating procedure

Step	Description	
1	On the main page, press the  button to access the "Options and Settings" page: - Press the "CUTTING PROCESS CONTROL" button to access the corresponding settings page.	
		
2	 : defines how far the stop needs to be moved away from the workpiece.  : defines the value below which the offset can be controlled (external dimension of the workpiece).	
3	After selecting the workpiece and commanding the positioning of the mobile stop, the offset icon  appears if the external dimension of the workpiece to be cut is below the offset value.	
4	After commanding the offset, the out-of-position signal is displayed. Press the  button to reposition the stop or select the other side of the moulding for the next cut.	

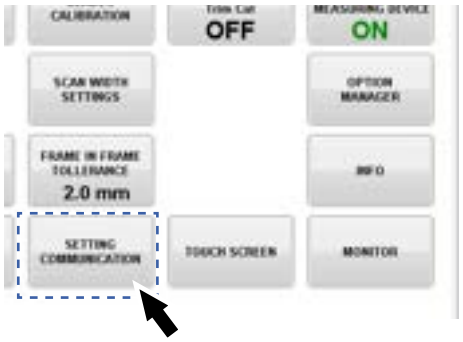
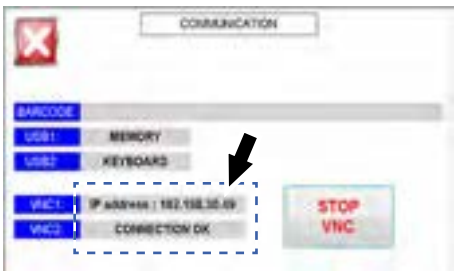
4.19. REMOTE CONNECTION VIA VNC

Introduction

It is possible to connect to the machine's control system in remote mode for the purpose of machine programming and operation assistance, but only via a PC connected to the same local network.

NOTE
For safety reasons, motors cannot be controlled remotely.

Operating procedure

Step	Description	
1	• Connect one end of an Ethernet cable to the LAN port on the back of the control panel. • Connect the other end of the cable to the router or a switch on a local network.	
2	On the main page, press the button to access the 'Options and Settings' page: - Then press the "SETTING COMMUNICATION" button.	
3	On the "COMMUNICATION" page, press the "START VNC" button.	
4	Wait for the "CONNECTION OK" notification and the dynamic IP address to appear on the screen.	

cont. ...

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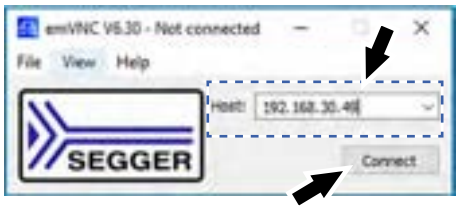
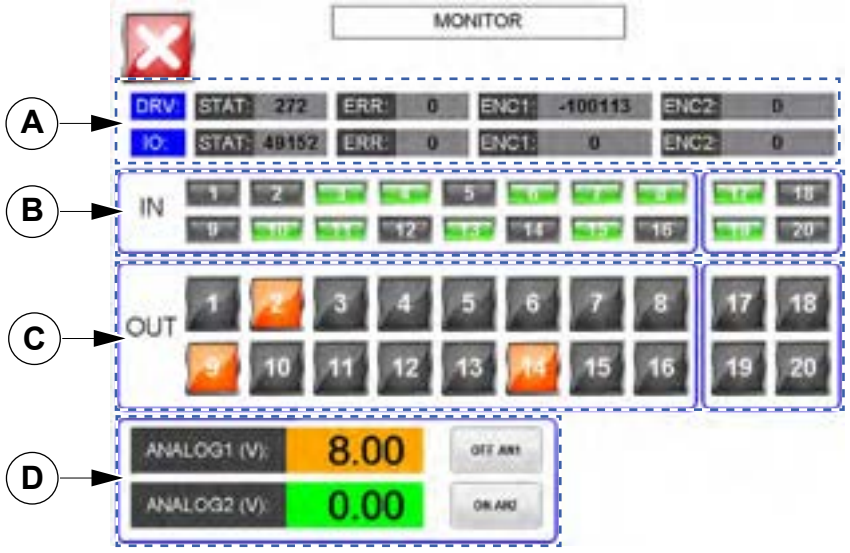
Operating procedure

Step	Description	
5	From a PC connected to the same local network: ● run a VNC emulation program, for example, "emVNC.exe"  ; ● enter the control system's IP address in the "HOST" field; ● press the "Connect" button.	
	*NOTE* *To connect to the machine remotely via the Internet, connect to the local PC using a remote desktop program, for example:* - Teamviewer; - Anydesk; - or similar.	

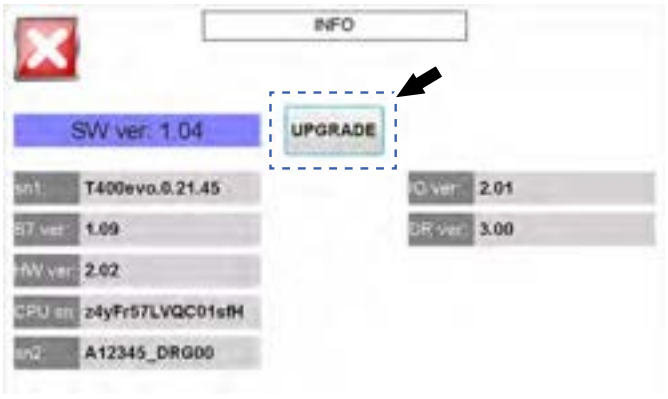
4.20. System Diagnostics

Instructions

Step	Description
1	On the main page, press the  button to access the 'Options and Settings' page: - Then press the 'MONITOR' button. - The diagnostics page can only be accessed when the password has been entered for the relative authorized user level.
	
2	A. Axis control and encoder channels 1 and 2 count section B. Inputs section. C. Outputs section. D. Analog output 1 and 2 section.
	
	NOTE *Consult the wiring diagram, provided as an attachment to this documentation, for details on the correspondence between signals and machine hardware.*

4.21. SYSTEM INFORMATION

Instructions

Step	Description
1	On the main page, press the  button to access the 'Options and Settings' page: - Then press the 'INFO' button. - Enter the password requested according to the enabled user level.
	
	NOTE *Press the 'UPGRADE' button if you need to perform the software version installation procedure.*
	

5 ROUTINE AND SPECIAL MAINTENANCE

CONTENTS

5.1. GENERAL SAFETY RULES FOR MAINTENANCE

Personal protective equipment required

Wear PPE that is:
- suitable for the operations being performed;
- resistant to the products used for cleaning.
- clothing must be close-fitting;
- do not wear ties, necklaces or belts that could get caught up or trapped between moving parts.

WARNING
Long hair must be adequately tied up to stop it from getting caught up or trapped between moving parts.

Rules for authorized personnel

All maintenance work must be carried out exclusively by authorized personnel who will:
- put up appropriate "MACHINE UNDER MAINTENANCE" signs;
- avoid damaging the machine in any way;
- restore the effectiveness of all units that have undergone maintenance and any safety devices that may have been disabled.

Rules for restarting the machine

At the end of maintenance operations, before restarting the machine, always check that:
- any parts that have been replaced and/or tools used to perform maintenance work have been taken away from the machine;
- all safety devices are working properly.

Rules for the person in charge

At the end of maintenance operations, the machine may only be started after permission has been given by the authorized person in charge, who must ensure:
- that all the work has been carried out correctly and completely;
- that the machine is in perfect working order.
- that all safety systems and safeguards are present and working efficiently.

5.1.1. Prescriptions, contraindications and prohibitions

Authorized personnel

WARNING
All maintenance, inspection and control operations must be carried out by trained and authorized personnel, who must take all the necessary precautions to avoid potentially hazardous situations for themselves, any other exposed persons and the machine itself.

In the event of anomalies:

Any machine anomaly must be reported immediately to company supervisors/ managers.
It is strictly forbidden for unauthorized personnel to carry out work on the machine and/or force or remove safeguards, even during adjustment, cleaning and maintenance operations.

In the event of an anomaly affecting the safety devices and guards

WARNING
If any of the safety devices are not working properly or if the guards are damaged, stop the machine immediately and notify the person in charge.

Before restarting the machine, always check that the safety devices and guards are installed and working properly

Safety signs

It is strictly forbidden and punishable by law to remove the danger and warning signs affixed to the machine.

Products for cleaning the machine

It is strictly forbidden to use benzene, solvents or other flammable liquids as detergents.
Use authorized commercial products only and abide by the warnings provided on their safety data sheets.

Rules for component replacement

WARNING
Components must always be replaced using original spare parts or parts of equivalent quality and safety.

5.1.2. LOCKOUT and TAGOUT (LOTO) procedures

What are LOCKOUT / TAGOUT procedures?

Lockout / Tagout procedures are sequences of activities aimed at isolating the machine from all power supplies so that work, such as adjustments, maintenance, etc., can be carried out in total safety.

“LOCKOUT”
The term LOCKOUT indicates a method used to prevent equipment from starting up and constituting a danger for workers.

- A safety switch, valve or other power supply shut-off mechanism is set in the safety or "OFF" position.
- A locking device is then placed on the shut-off mechanism to ensure it stays in the safety position.

WARNING
It is essential to apply a lock to prevent equipment start-up (see heading 3.1 HOOK-UP POINTS AND POWER SUPPLY SHUT-OFF).

“TAGOUT”
In a TAGOUT, the power supply shut-off device is placed in the safety position and a written warning tag is affixed to it.

Purpose of the LOCKOUT / TAGOUT procedure

The Lockout / Tagout procedure is necessary whenever maintenance is carried out on or in the vicinity of the machine that could cause injury if:

- the equipment starts up unexpectedly.
- the equipment is voluntarily or involuntarily started up by an operator who is unaware of the fact that one or more operators are working in the danger zone/s.
- stored energy is released.

cont. ...

cont. ...

When to use the LOCKOUT / TAGOUT procedure

Typical situations in which the Lockout / Tagout procedure must be adopted include:

- when a guard or other safety device needs to be removed or disabled.
- when it is necessary to insert a body part into an area where it could get caught up or trapped in moving parts.

Activities for which application of the Lockout / Tagout procedure is appropriate:

- cleaning or lubricating machines with moving parts;
- unblocking jammed mechanisms.

Safety prescriptions and warnings

WARNING
Every worker who uses a Lockout, Tagout or both systems is responsible for using the system chosen for their operating position.
Lockout/Tagout systems, such as padlocks and written tags, do not in themselves cut off power supplies to the equipment and are only effective when the machine has already been isolated from all power supplies.

NOTE
All Lockout and Tagout materials (locking devices, tags, etc.) must be supplied by the employer.

5.2. ROUTINE MAINTENANCE - PERIODICAL CHECKS

Introduction

Periodically and before starting the operating cycle, check that the main machine functions are performed effectively.

WARNING
The indications below must also be observed periodically over the machine's life cycle, in order to guarantee the constant efficiency of all systems/circuits related to control and operation.

Frequency

Periodic maintenance of the machine must be carried out at regularly scheduled intervals in order to minimize downtime, optimize use and eliminate potential risks for operators and the machine itself.

5.2.1. Safety devices: operational checks and function

Operational checks - Daily	Function
With the machine in operation: ● Press the emergency stop button.	To check that the movements or functions in progress stop immediately.
With the machine ready for operation: ● Try opening the interlocked guards.	● To make sure the guards remain closed. ● To check that the guards can only be opened when the machine is stopped and only after pressing the release button (see heading 4.11 "Procedure for accessing areas protected by safety guards").

Table 5 - 1

5.2.2. Electrical system: operational checks and function

Operational checks - periodic	Function
Every day, check that the electrical boxes are closed.	To prevent hazardous situations for any exposed persons and allow normal operation of the work cycle.
Every day, act on the main power disconnect switch located on the electrical cabinet's control panel.	To check the correct electrical connection of the machine and associated units.
Once a week, clean sensors, photocells, limit switches, etc..	To ensure correct operation of the control and management devices.
Once a week, visually inspect the electrical cables.	To check for any twisting, snags, or breaks in the outer sheath, replacing cables if necessary with new ones with the same technical specifications.

Table 5 - 2

5.2.3. Pneumatic system: operational checks and function

Operational checks - periodic	Function
Once a week check the condition of the pipes and replace if the outer sleeve is damaged.	These preventative maintenance operations are intended to preserve the safety and efficiency of the pneumatic circuits and associated components.

Table 5 - 3

5.2.4. Periodic maintenance operations carried out by the operator

Personal protective equipment to be worn

Introduction

Below is a list of all the periodical checks/inspections, adjustment and control operations, and ROUTINE MAINTENANCE work that can be carried out by the machine operator  .

The position of the machine components is shown in the layouts enclosed with this manual.

WARNING
The replacement of parts and components is the exclusive responsibility of the authorised maintenance technician.

Frequency	Component / Area	Description of Operation
Before the start of each shift	Cleaning of the working area.	• The operating position and the exterior of the machine must be kept clean. Remove all dust and any objects which could impede correct operation and/or compromise safety. • Remove all shavings from the machine with a jet of compressed air and lint-free cloths.
Before the start of each shift	Fixed guards inspection.	• Check that all the fixed guards are correctly installed and perform their intended function. • Check their condition, both internally and externally, and make sure there are no signs of damage.
Once a week	Safety labels and data plates affixed to the machine	• Check that all warning labels and data plates are correctly positioned and perfectly legible. • If damaged, replace them with identical copies. Contact the manufacturer if necessary.

Table 5 - 4

5.2.5. Periodic maintenance operations carried out by the maintenance technician

Personal protective equipment to be worn

Introduction

Below is a list of all the periodical checks/inspections, adjustment and control operations, and ROUTINE MAINTENANCE work that must be carried out solely and exclusively by an authorized maintenance technician.

- Maintenance mechanic 
- Maintenance electrician 

The position of the machine components is shown in the layouts enclosed with this manual.

WARNING
The replacement of parts and components is the exclusive responsibility of the authorised maintenance technician.

Frequency	Component / Area	Description of Operation
Daily	Check and, if necessary, replace: ● Blades.	Check the blades daily to ensure they are intact; they must be replaced if you notice any dents, deformations or excessive wear.
When necessary	Adjustments: ● cutting angle at 45°	Adjust the angle of the blades by increasing or decreasing it to suit production requirements.
When necessary	Positioning: ● Blades position adjustment.	Adjust the position of the blades to suit production requirements.
When necessary	Adjustments: ● vertical angle of the blades.	Adjust the vertical angle of the blades to suit production requirements.
When necessary	Adjustments: ● Air treatment unit lubricator.	When necessary, make the necessary adjustments using a screwdriver.
Monthly	Check condition: ● vertical clamping systems.	Check that the clamping systems are in good condition. Replace if necessary.
Monthly	Check and, if necessary, replace: ● support blocks.	Check that the support blocks are in good condition, with no dents or signs of excessive wear. Replace if necessary.

Table 5 - 5

cont. ...

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Frequency	Component / Area	Description of Operation	
Monthly	Lubrication: ● cylinder rods... . ● cylinder grease nipples... .		● Lubricate the rods by brushing on a thin layer of lubricant. ● Lubricate the cylinders using the relative nipples installed on the cylinders.
Every 6 months	Check, adjust and, if necessary, replace: ● drive belts.		Check that the drive belts are in good condition and properly tensioned: ● Tension the belts if necessary. ● Replace if necessary.
Every 6 months	Check condition: ● horizontal clamping systems.		Check that the clamping systems are in good condition. Replace if necessary.
Every 6 months	Lubricator inspection: ● air treatment unit.		Check the correct oil level in the air treatment unit. Top up the oil level in the lubricator if necessary.
When necessary	Check and, if necessary, replace: ● START button.		Check that the START button is intact and functions correctly. Replace if necessary.
When necessary	Check and, if necessary, replace: ● control system safety components:		Check that the control system safety components function correctly. Replace if necessary.
When necessary	Check and, if necessary, replace: ● filtering element in SMC AME 350 oil separator for IN502 flow meter. (installed on the inlet of the electronic flow regulator)		● Replace the filtering element if red spots appear on the surface. ● Replace the filtering element if a pressure drop of 0.1 MPa is detected or after 2 years of operation. (See the specific component instructions provided as an attachment to this documentation).

Table 5 - 6

5.3. ROUTINE MAINTENANCE INSTRUCTIONS

Introduction

WARNING
Before carrying out these operations, make sure the machine is stopped in safety conditions and disconnected from all power supplies.

5.3.1. Pneumatic system

Introduction

The pneumatic unit is equipped with a filtering system with automatic / manual discharge of any condensate that may form.
Consequently periodical checks must be carried out.

Activities to be carried out

- Check the level of condensate collected in the cup ONCE A WEEK and empty if necessary by acting on the relative drain valve (A) shown in the figure below.
- EVERY DAY check the water drain in the filter of the compressed air supply unit.
- Every 6 months, check the correct oil level in the air treatment unit. Top up the oil level in the lubricator if necessary.
- PERIODICALLY check the condition of the filtering element inside the bowl. When necessary, adjust using a screwdriver.
- PERIODICALLY check the condition of the filtering element inside the bowl. Replace when necessary.

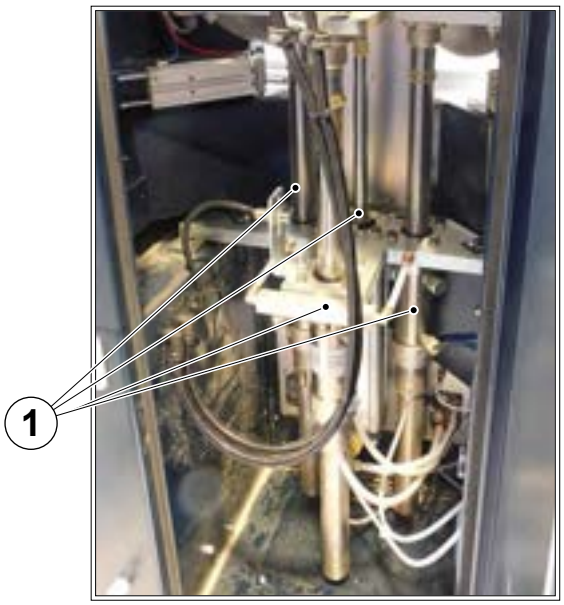
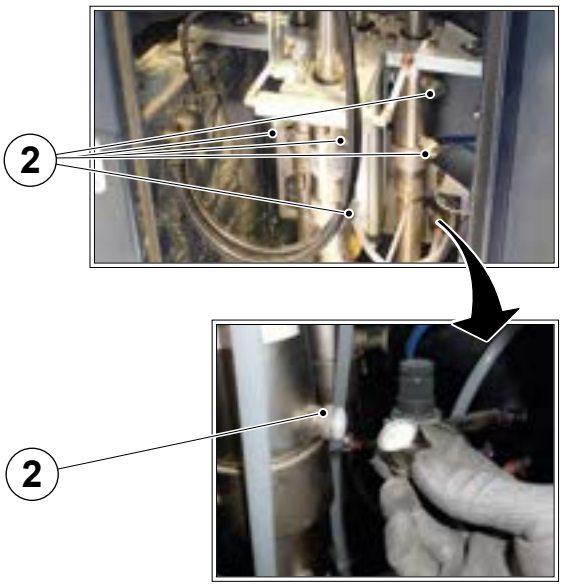
Fig. 5 - 1

5.3.2. Lubrication procedures

Authorized operator and Personal protective equipment to be worn

Introduction

Before lubricating the stems, thoroughly clean the whole area involved.

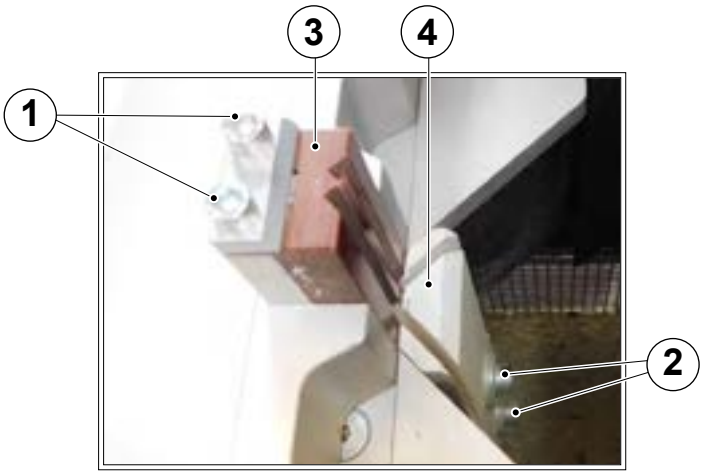
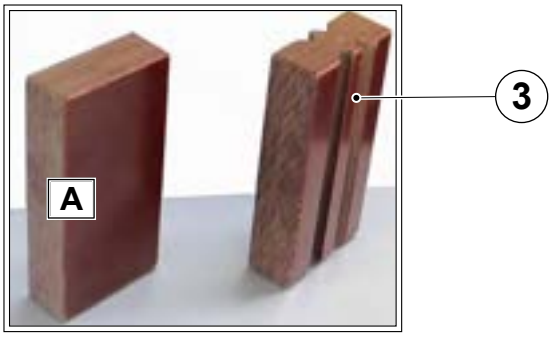
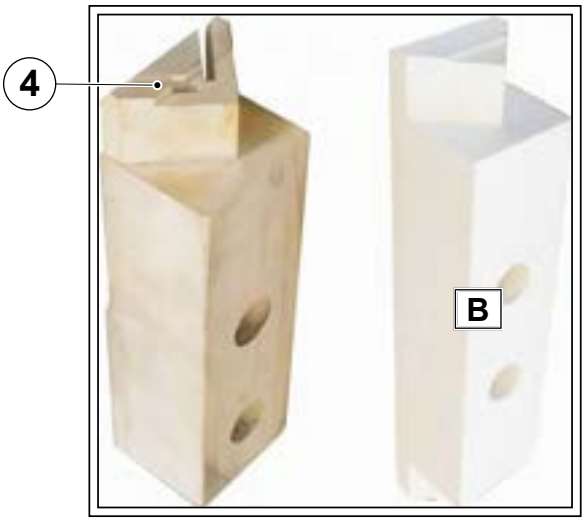
Frequency	Description	
Monthly	• Follow the instructions provided in section 4.11 "Procedure for accessing areas protected by safety guards" to open the blade safety guard. • Lubricate the rods (1) by brushing on a thin layer of lubricant.	
	Lubricate the cylinders using all the preloaded applicators (2) located on them, as shown in the example shown in the figure.	

5.3.3. Replacing the cutting support blocks

Authorized operator and Personal protective equipment to be worn

Introduction

At least once a month, check that the support blocks are in good condition, with no dents or signs of excessive wear. Replace if necessary.

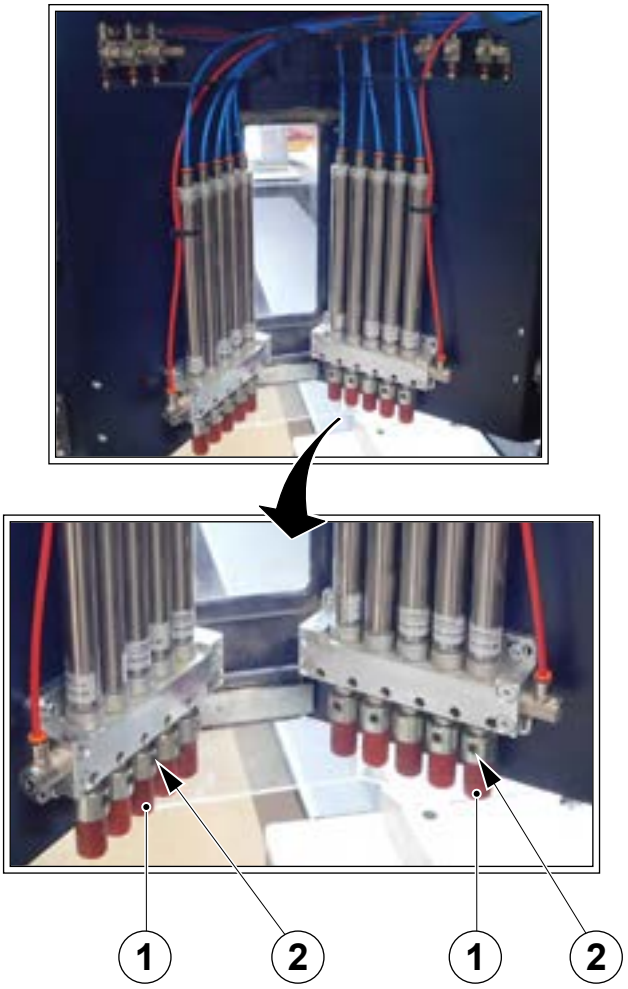
Frequency	Description	
Monthly	• Follow the instructions provided in section 4.11 "Procedure for accessing areas protected by safety guards" to open the blade safety guard. • Remove the screws (1) and (2) • Remove supports (3) and (4) and turn them if necessary. In case of excessive wear or anomalies, replace them with new ones (see examples "A" and "B" in the figure). • Secure the reinserted supports in place using screws (1) and (2). • Check their correct alignment and levelling in relation to the work surface. • Then perform a low-speed milling operation (with no moulding present) in order to recreate the cutting seat in the relative support blocks.	  

5.3.4. Checking and replacing the vertical clamping systems

Authorized operator and Personal protective equipment to be worn

Introduction

At least once a month, check that the clamping systems are in good condition. Replace if necessary.

Frequency	Description	
Monthly	• Follow the instructions provided in section 4.11 "Procedure for accessing areas protected by safety guards" to open the blade safety guard. • Check the condition of all the stoppers (1). If they are worn or damaged, loosen the screws (2) to replace them. • After installing new stoppers, secure in place by retightening the screws (2).	

5.3.5. Checking and replacing the horizontal clamping systems

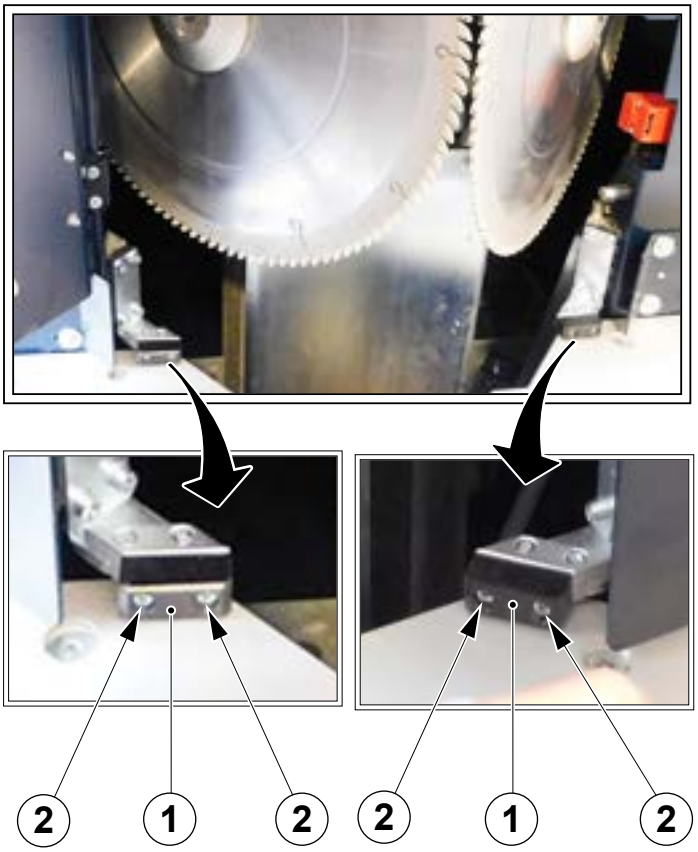
Authorized operator and Personal protective equipment to be worn

Introduction

At least once every 6 months, check that the clamping systems are in good condition. Replace if necessary.

Safety warnings - Residual risk of cutting

WARNING
Any work that involves accessing the vicinity of the cutting blade area must be carried out by specialized and authorized operators/ maintenance personnel who must wear the appropriate and necessary PPE and observe the safety procedures illustrated in this manual.

Frequency	Description	
Every 6 months	• Follow the instructions provided in section 4.11 "Procedure for accessing areas protected by safety guards" to open the blade safety guard. • Check the condition of the stoppers (1). If they are worn or damaged, loosen the screws (2) to replace them. • After installing new stoppers, secure in place by retightening the screws (2).	

5.3.6. Changing the blades

Authorized operator and Personal protective equipment to be worn

Introduction

Check the blades daily to ensure they are intact; they must be replaced if you notice any dents, deformations or excessive wear.

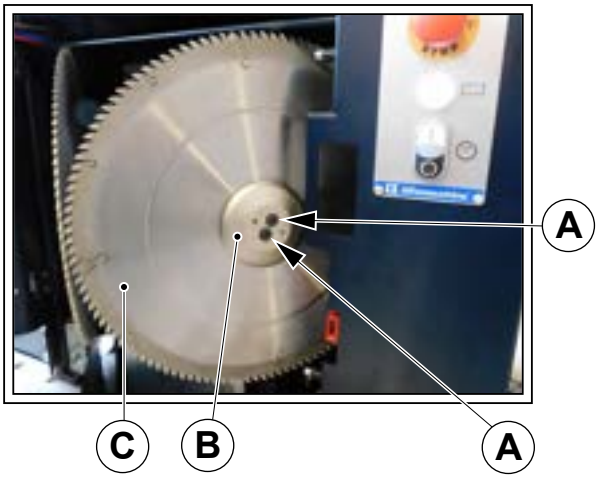
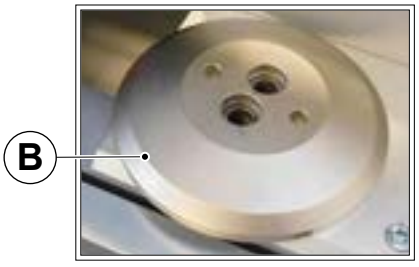
Safety warnings - Residual risk of cutting

WARNING
Any work that involves accessing the vicinity of the cutting blade area must be carried out by specialized and authorized operators/ maintenance personnel who must wear the appropriate and necessary PPE and observe the safety procedures illustrated in this manual.

Rules for blades replacement

CAUTION
The blades to be used must meet the following specifications:
- be compliant with standard EN 847-1 and designed to reduce noise emissions;
- have a maximum permissible speed greater than the rotational speed of the blade shaft;
- be correctly sharpened.

Furthermore, avoid using single-piece high-speed steel (HS) blades.

Step	Description	
1	Follow the instructions provided in section 4.11 "Procedure for accessing areas protected by safety guards" to open the blade safety guard.	
2	Using the appropriate tool, loosen the screws (A).	
3	Remove the outer flange (B).	
4	Remove the blade (C), then: ● carefully clean the area; ● check that the flange (B) is intact, free of dents and deformations. ● Position the new blade with the teeth facing the correct cutting direction, as shown in the figure. Tighten the flange (B) correctly.	
5	Balance the new blade.	

5.3.7. Blade cutting angle adjustment procedure

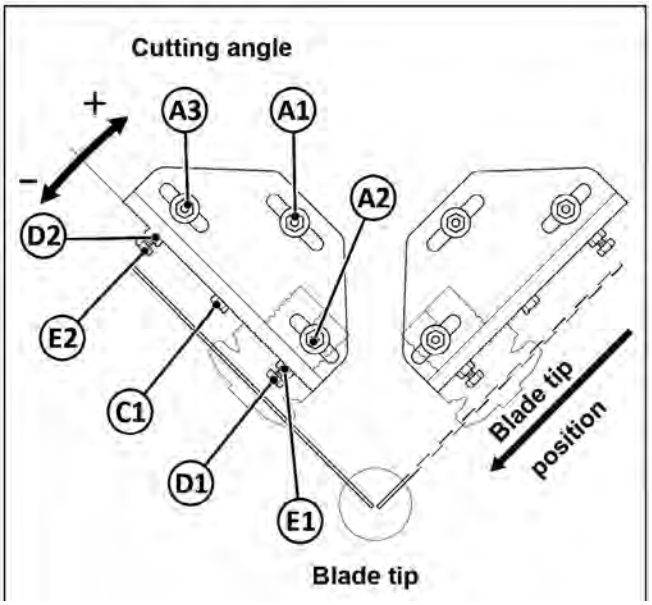
Authorized operator and Personal protective equipment to be worn

Introduction

Following blade replacement, or when dictated by work requirements, adjust the blades' cutting angle.

Safety warnings - Residual risk of cutting

WARNING
Any work that involves accessing the vicinity of the cutting blade area must be carried out by specialized and authorized operators/ maintenance personnel who must wear the appropriate and necessary PPE and observe the safety procedures illustrated in this manual.

Step	Description	
Follow the instructions provided in section 4.11 "Procedure for accessing areas protected by safety guards" to open the blade safety guard.		
To INCREASE the cutting angle, proceed as follows:		
1	Check that screw (C1) is tight.	
2	Slacken nuts (A1), (A2), (A3).	
3	Slacken nut (E2).	
4	Slightly slacken screw (C1).	
5	Slacken screw (DZ) by a quarter turn (max.) or as much as is necessary.	
6	Tighten nut (E2).	
7	Tighten screw (C1).	
8	Using an indicator, check that the blade has reached the required angle and tighten nuts (A1), (A2) and (A3).	
To REDUCE the cutting angle, proceed as follows:		
1	Slacken nuts (A1), (A2), (A3).	
2	Slacken nut (E2).	
3	Slightly slacken screw (C1).	
4	TIGHTEN screw (DZ) by a quarter turn (max.) or as much as is necessary.	
5	Tighten nut (E2).	
6	Tighten screw (C1).	
7	Using an indicator, check that the blade has reached the required angle and tighten nuts (A1), (A2) and (A3).	

5.3.8. Blade positioning procedure

Authorized operator and Personal protective equipment to be worn

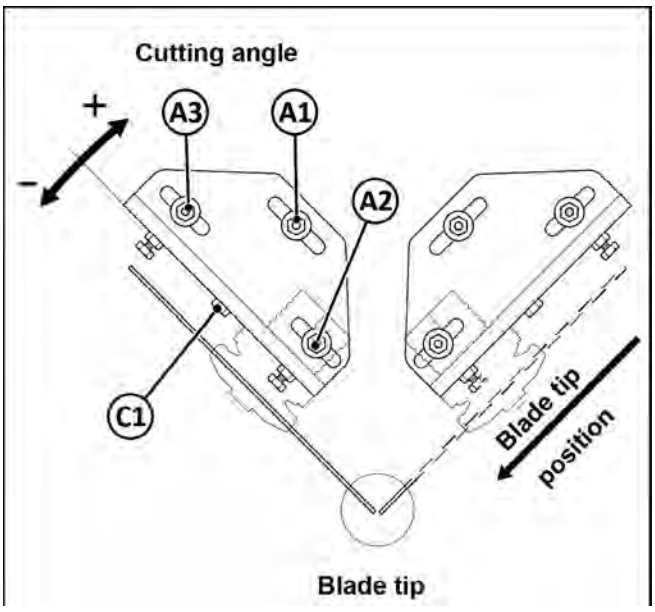
Introduction

Following replacement operations, or when work requirements so dictate, the position of the cutting blades must be adjusted.

Safety warnings - Residual risk of cutting

WARNING
Any work that involves accessing the vicinity of the cutting blade area must be carried out by specialized and authorized operators/ maintenance personnel who must wear the appropriate and necessary PPE and observe the safety procedures illustrated in this manual.

Step	Description
Follow the instructions provided in section 4.11 "Procedure for accessing areas protected by safety guards" to open the blade safety guard.	
1	Slacken nuts (A1), (A2), (A3).
2	Slacken screw (C1).
3	Move the blade support forward so that the distance at the vertex between the two blades is 1.5 - 2.0 mm.
4	Tighten screw (C1) and nuts (A1), (A2) and (A3).



5.3.9. Procedure for checking the vertical angle of the blades

Authorized operator and Personal protective equipment to be worn

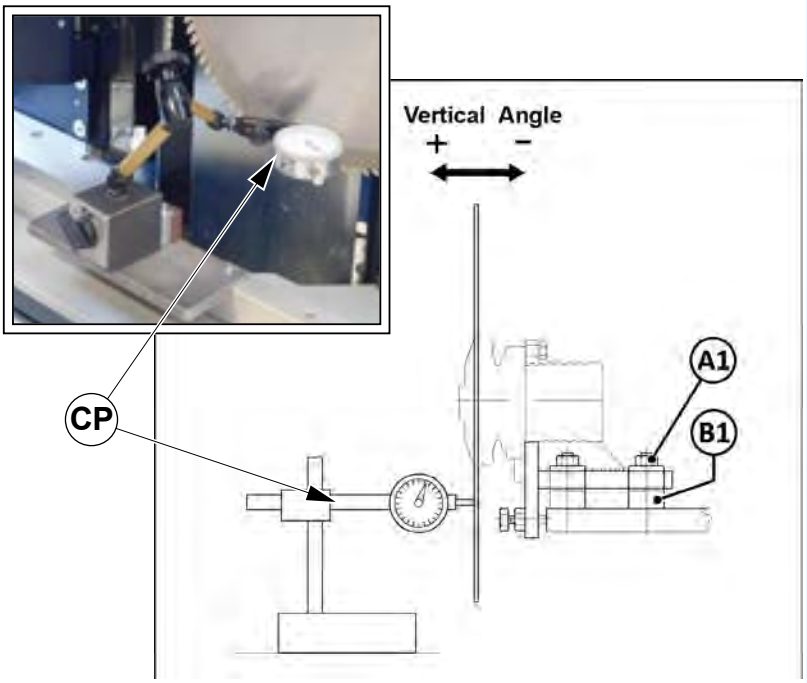
Introduction

Following replacement operations, or when work requirements so dictate, the vertical angle of the cutting blades must be checked and adjusted if necessary.

Safety warnings - Residual risk of cutting

WARNING
Any work that involves accessing the vicinity of the cutting blade area must be carried out by specialized and authorized operators/ maintenance personnel who must wear the appropriate and necessary PPE and observe the safety procedures illustrated in this manual.

Step	Description
Follow the instructions provided in section 4.11 "Procedure for accessing areas protected by safety guards" to open the blade safety guard.	
1	Slacken nut (A1).
2	To INCREASE the angle (“+” see diagram): ● Slightly TIGHTEN nut B1 (max. 1/8 of a turn). To DECREASE the angle (“-” see diagram): ● Slightly LOOSEN nut B1 (max. 1/8 of a turn).
3	Tighten nut (A1).
4	● Check the vertical angle on the relative gauge (CP), as shown in the example alongside. ● Repeat steps "**1**" to "**3**" until the desired position is reached.



NOTE
The cutting angle adjustment, as described in steps 1 and 2, can be performed making full use of the adjustment slots in the supports.

CAUTION
Avoid adjusting the cutting angle by acting on the right blade: always adjust the left blade only.

5.3.10. Blade drive belt inspection, tensioning, and replacement procedure

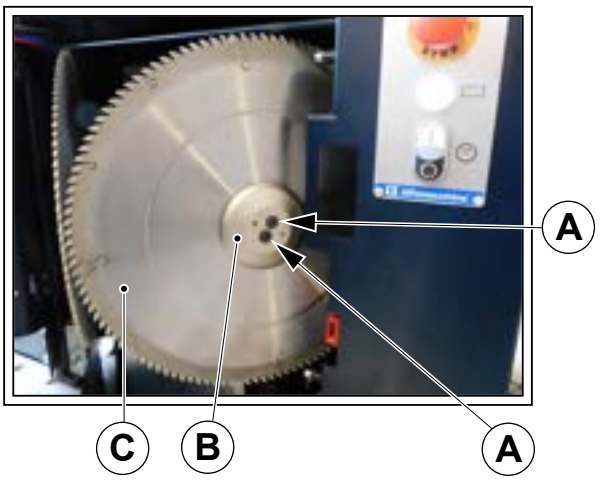
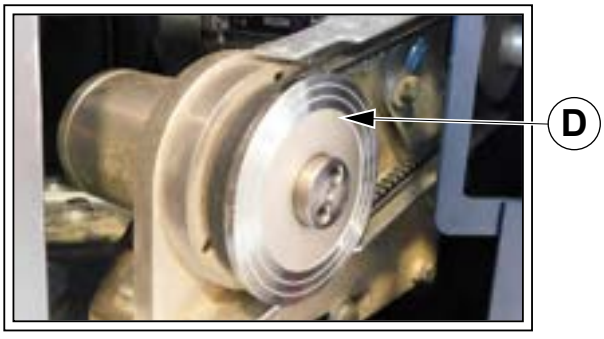
Authorized operator and Personal protective equipment to be worn

Introduction

Check the condition and tension of the blade drive belt at least every 6 months.

Safety warnings - Residual risk of cutting

WARNING
Any work that involves accessing the vicinity of the cutting blade area must be carried out by specialized and authorized operators/ maintenance personnel who must wear the appropriate and necessary PPE and observe the safety procedures illustrated in this manual.

Step	Description	
1	Follow the instructions provided in section 4.11 "Procedure for accessing areas protected by safety guards" to open the blade safety guard.	
2	Using the appropriate tool, loosen the screws (A).	
3	Remove the outer flange (B).	
4	Remove the blade (C), then: ● remove the inner flange (D). ● Carefully clean the area.	

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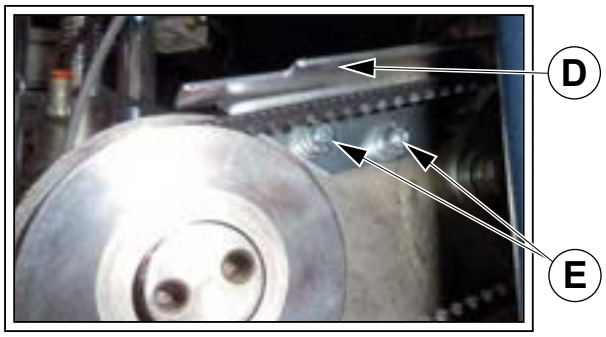
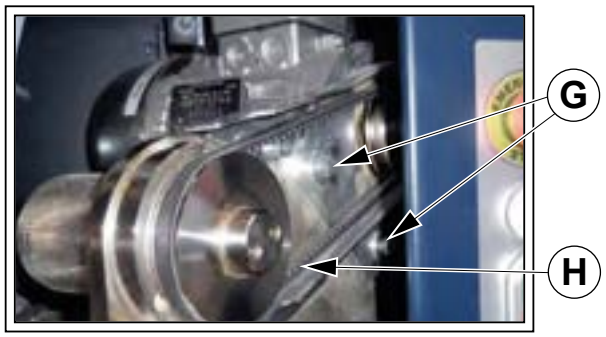
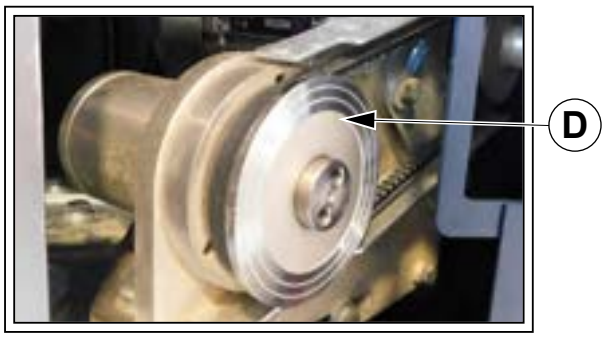
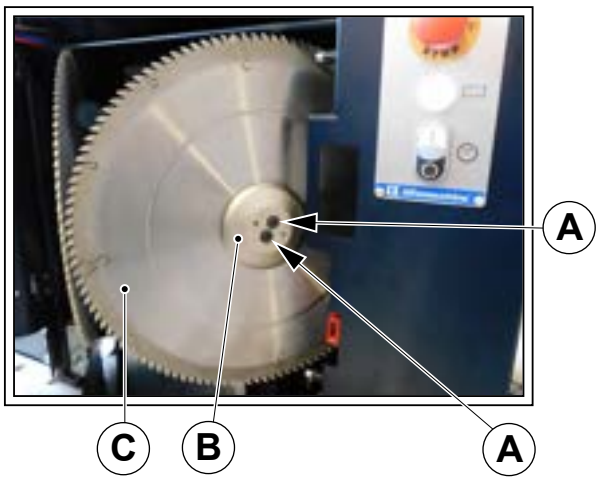
Step	Description	
5	Check the condition and correct tension of the belt and, if necessary: ● Loosen the two screws (E). ● Remove the guard (F). ● Loosen the screws (G). ● If necessary, replace the belt (H).	
6	Tension the belt (10H).	
7	Tighten the screws (9G).	
8	● Replace the guard (8F) correctly and tighten it. ● Tighten the two screws (7E).	
9	● Replace the inner flange (D) correctly. ● Correctly replace the blade (C) with the teeth facing the correct cutting direction, as shown in the figure. Tighten with the external flange (B) using the screws (A).	
10	Close the blade safety guard.	
11	Start the blades and let them rotate for approximately 10 minutes before checking the belt tension.	

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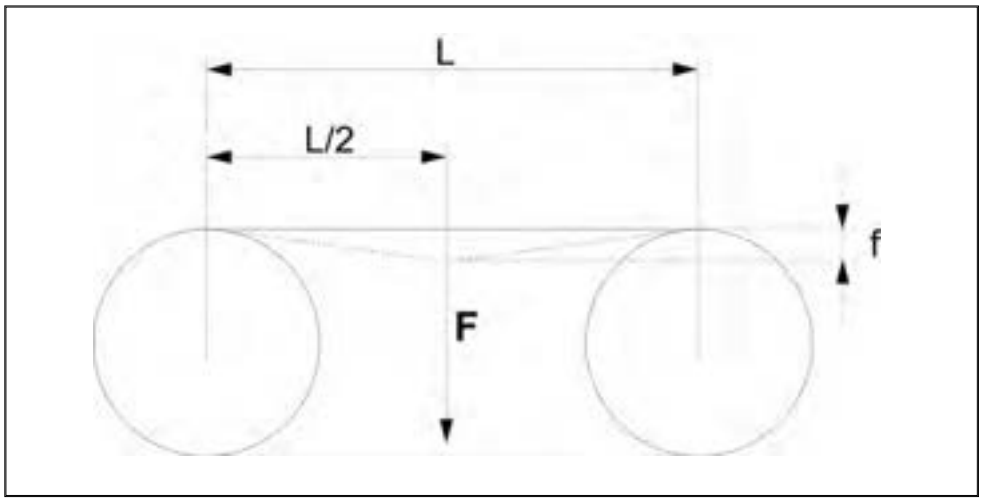
Step	Description
12	To check the belt tension, proceed as follows: ● On the upper midpoint of the belt, apply a perpendicular downward force (F) of 5 kg. ● Measure the deflection (f) of the upper part of the belt, i.e., the sag caused by the applied force. It must be between 3 and 4 mm. ● Adjust the tensioning system to obtain different deflection values.



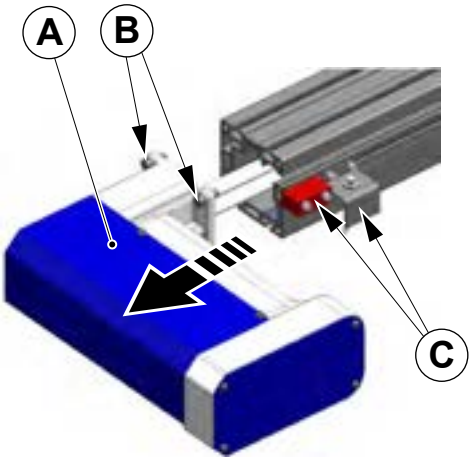
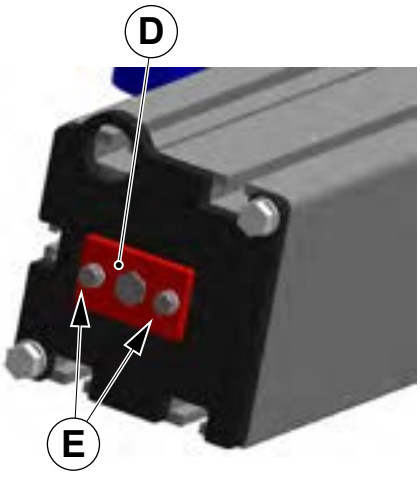
5.3.11. Mobile stop positioning belt inspection, tensioning, and replacement procedure

Authorized operator and Personal protective equipment to be worn

Introduction

Check the condition and tension of the mobile stop positioning belt at least every 6 months.

The belt is held in place by two plates located under the stop carriage which are not accessible from outside the machine.
When the belt needs replacing, or if due to an impact it should come off one of the fixing plates on the carriage, reassemble as follows.

Step	Description	
1	Remove the motor unit (A) by unscrewing the four screws (B).	
2	Cut the cable ties and lay the motor to the side.	
3	Dismantle the mechanical stop and, if applicable, the sensor support (C) to remove the carriage.	
4	Go to the opposite end of the unit from the motor: ● Remove the red anti-loosening plate (D) by unscrewing the two screws (E).	

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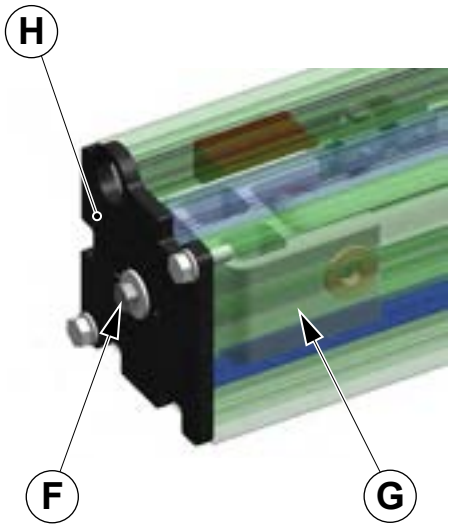
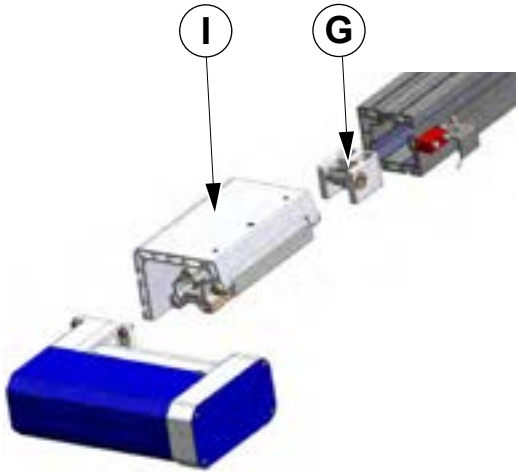
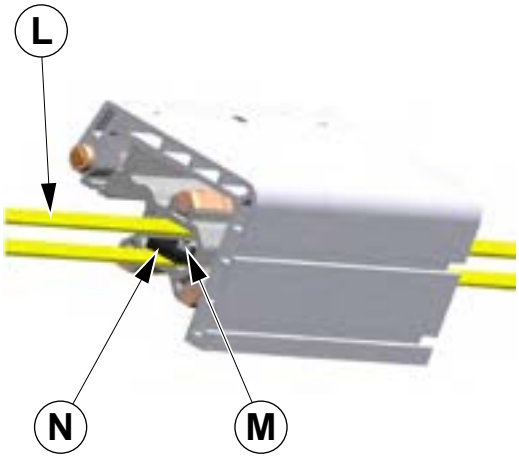
Step	Description	
5	Completely unscrew the screw (F) to release the tensioner (G), without removing the plate (H).	
6	Remove the carriage (I) and the tensioner (G) completely from the guides.	
7	Check the condition and tension of the belt (L) and replace it if necessary: • To remove the belt (L), unscrew the screw (M) on the plate (N). • Install the new belt (L) and secure in place with the plate (N) and screw (M).	

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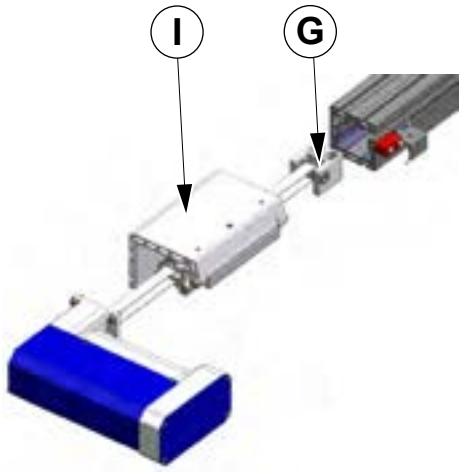
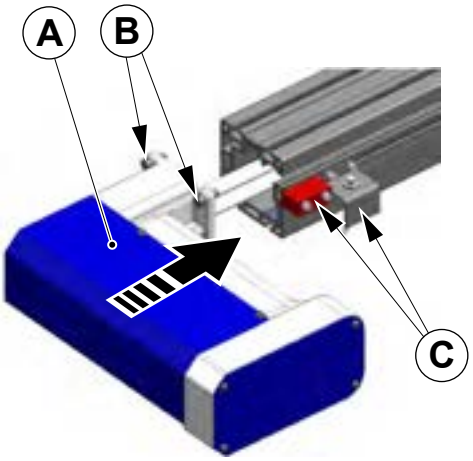
Step	Description	
8	• Insert first the tensioner (G) and then the carriage (I) into the beam. • Move everything to the travel stop.	
9	• Replace the motor unit (A) and secure in place with the four screws (B). • Install the mechanical stop and the support (C).	

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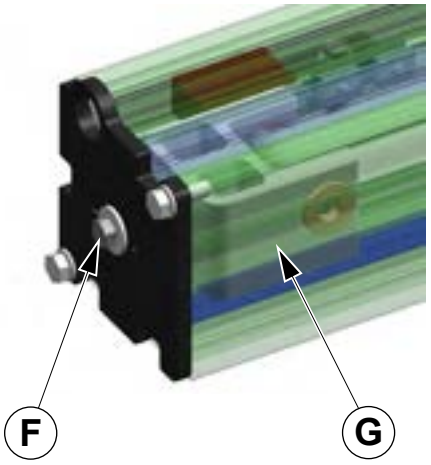
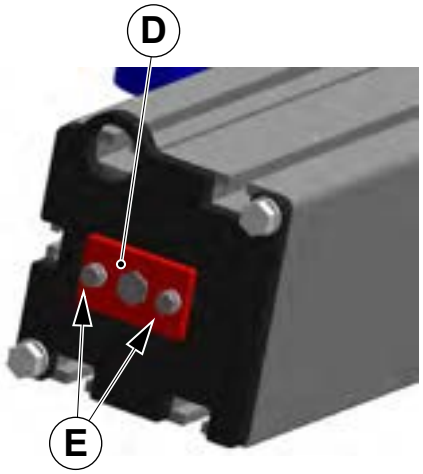
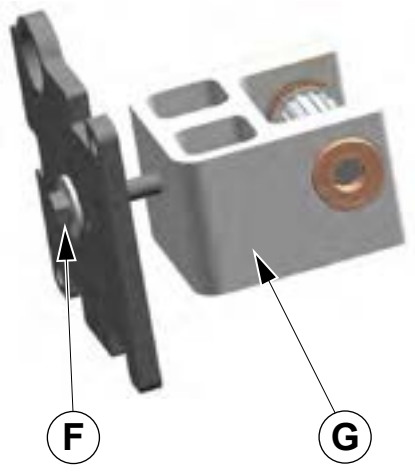
Step	Description	
10	Go to the opposite end of the unit from the motor to adjust the belt tension by tightening the central screw (F) on the tensioner (G) with a torque wrench. Observe the following parameters: ● For mobile stop lengths up to 4000 mm: - 1.5Nm ● For mobile stop lengths over 4000 mm: - 2 Nm	
11	Once the correct tension has been achieved, replace the red anti-loosening plate (D) and secure in place with the two screws (E).	
	NOTE *If a torque wrench is not available, the procedure, described below, can be used for approximate belt tensioning.* *However, this method should only be used in an emergency.*	
Place the central screw (F) against the tensioner (G). To tension the belt, tighten screw (F) as follows: ● 19 full turns of the screw for a tension of approximately 1.5 Nm. ● 21 full turns of the screw for a tension of approximately 2.0 Nm. This procedure considers the following belt lengths: ● AG2000: 4870 mm ● AG3000: 6870 mm ● AG4000: 8870 mm ● AG5000: 10870 mm		

5.4. UNSCHEDULED MAINTENANCE

Safety prescriptions

WARNING
Unscheduled maintenance and component replacement operations (see for example, heading 4.14.2 "Blade calibration procedure") must be carried out exclusively by technicians employed or authorized by the manufacturer.
Furthermore, at the end of unscheduled maintenance operations, make sure that any safeguards that needed to be removed have been correctly replaced.

5.5. SCRAPPING AND DISPOSAL

Safety rules

WARNING

Before beginning disassembly operations, create a sufficiently large and tidy space around the machine so that all operations can be carried out unhampered by any risks created by the surroundings.
Observe the prescriptions imposed by the laws in force and the relative authorities in the country of machine scrapping.

Characteristics of construction materials

With regard to machine demolition and disposal, please note that the construction materials are non-hazardous and essentially consist of:

- Iron, steel.
- Electric cables/wires and their sheaths
- Nylon piping
- Polycarbonate guards
- Rubber seals

Authorized personnel

Machine demolition must be carried out by expert personnel.

Preliminary operations

Before proceeding with dismantling operations, it is essential to:

- Disconnect the machine from all power supplies.
- Disconnect the compressed air supply.
- Disconnect the electrical cables coming from the disconnect switches.
- Disconnect the power cables from the electrical enclosures.

Macro-operation procedures

Proceed as follows:

- disassemble the machine into its main parts;
- divide the machine parts up according to their composition (e.g. metal, plastic materials, etc.) and send them to appropriate authorized waste collection centres;
- proceed with scrapping in accordance with the laws in force.

5.5.1. Disposal of electrical and electronic equipment

Rules to be observed (in the European Community)

Within the EU all electrical and electronic equipment must be disposed of in accordance with EC Directive 2012/19/EU on waste electrical and electronic equipment (WEEE).

WARNING
The user must send the equipment to a waste disposal centre or consortium authorised to handle and recycle WEEE.
Failure to observe this prescription is punishable by law.

NOTE
If the user purchases new equipment of THE SAME TYPE, the old equipment can be returned to the manufacturer who is legally obliged to take away it away and dispose of it on a one-to-one basis.

Rules to be observed (in countries outside the European Community)

Dispose of electrical and electronic equipment in accordance with the directives and regulations in force in the user's country.

5.6. TROUBLESHOOTING

Introduction

This section describes problems and anomalies that may occur during normal machine operation and the actions needed to resolve them.

WARNING
The following symbols indicate which tasks can be carried out by the operator and which must be carried out by an expert maintenance mechanic/electrician or by the authorized technical assistance service.

Symbol	Description
	Task which can be performed by the operator
	Task which must be performed by an expert maintenance mechanic.
	Task which must be performed by an expert maintenance electrician.
	Task which can only be performed by the manufacturer's technicians or expert operators/technicians authorized by the manufacturer.

5.6.1. Problem / malfunction, causes and remedies

Problem / malfunction	Cause	Remedy / solution	Authorized operator
Emergency error activated	Emergency stop activated.	Reset and check that the emergency stop button is working properly.	
Memory error parameters	Indicates that the system parameters are damaged.	The system must be reinitialised.	
The dimensions of the cut pieces are incorrect.	• The stop is not moving parallel to the guide. • Carriage affected by mechanical play. • Calibration procedure not performed correctly.	• Align the guide with the movement of the stop. • Check the belt tension. • Adjust or replace the carriage runners. • Reload machine parameters. • Accurately recalibrate the mobile stop.	
System error	Numerical control fault.	Contact Customer Service.	
Carriage overload.	Servo drive overload due to motor overload.	Contact Customer Service.	
Carriage overheating.	The operating temperature has exceeded the manufacturer's set value of 70°C / 158°F.	Contact Customer Service.	
Carriage error	The position error is too large, possibly caused by: • motor fault; • encoder fault; • excessively high speed request.	Contact Customer Service.	
I/O communication.	No communication between the NC controller and the I/O board or drive.	Check that the communication cables are not damaged and are correctly plugged into the RJ45 "BUS" ports.	

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Problem / malfunction	Cause	Remedy / solution	Authorized operator
Max. distance limit	A carriage position has been programmed to a value exceeding the maximum allowable value (check the value assigned to the protected MAX parameter).	Set a carriage position lower than the protected MAX parameter.	
Min. distance limit	A carriage position has been programmed to a value lower than the minimum allowable value (check the value assigned to the protected MIN parameter).	Set a carriage position higher than the protected MIN parameter.	
Backward movement limit switch	The safety limit switch was reached during a backward movement.	Set the carriage position between the forward and backward limit switches.	
Forward movement limit switch	The safety limit switch was reached during a forward movement.	Set the carriage position between the forward and backward limit switches.	
Carriage calibration request	The mobile stop has not been calibrated.	Calibrate the mobile stop.	
The control panel is not functioning.	• The main power supply is missing. • The auxiliary circuits aren't powered.	• Make sure the main power switch is turned to "I" (ON). • Check the upstream three-phase power supply and the presence of neutral. • Check the fuses in the electrical cabinet.	 
The control panel is ON, no safety device is active but the machine won't start.	START button disabled.	Check operation of the "START" button.	
When the START button is pressed, the pilot light comes on but the blades don't work.	Power is not reaching the motors.	Check/replace the safety fuses.	

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Problem / malfunction	Cause	Remedy / solution	Authorized operator
The control panel is ON but the machine won't start.	• The machine is not receiving pneumatic power. • Main filter regulator release not enabled. • Insufficient air pressure. • Safety device activated. • Emergency stop button pressed. • Motor protection circuit breaker tripped. • STOP button disabled.	• Power the machine by acting on the padlockable valve located on the air treatment unit. • Activate the release button on the main filter regulator. • Check that the supply and operating pressure correspond to the required technical characteristics (see section '2.4.1 Technical data').	
		• Ensure that the line pressure switch is functioning correctly.	
		• Ensure that the protections controlled by an electric lock are closed correctly. • Reset and check that the emergency stop button is working properly.	
		• Check whether the thermal overload relays have tripped. • Check that the stop button is working properly.	
The blades turn but after a few cycles the machine shuts down.	• Insufficient air pressure. • Motor overload. • Safety device activated.	• Power the machine by acting on the padlockable valve located on the air treatment unit. • Check that the supply and operating pressure correspond to the required technical characteristics (see section '2.4.1 Technical data'). • Ensure that the line pressure switch is functioning correctly.	
		• Check whether the thermal overload relays have tripped. • Check/replace the safety fuses.	
		• Check the blade descent speed based on the hardness of the material being cut. • Check that the guards are closed.	

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Problem / malfunction	Cause	Remedy / solution	Authorized operator
The machine stops after just a few cutting cycles and the motors are very hot.	• One of the motor power phases is missing. • The circuit breaker has tripped. • Brake malfunction.	• Ensure that all three phases of the power supply are present. • Check the fuses. • Check for any breaks in the contacts of the electromechanical components in the electrical cabinet. • Check the brake power supply. • Check the brake settings.	
The blade stopping time exceeds 10 seconds.	• The brake is not working correctly. • The brake is worn or damaged.	• Check the brake settings. • Replace the brake.	
The machine is running, but the workpiece is not clamped when the control pedal is pressed.	• The pedal isn't working. • The main air control solenoid valve is not working properly; • Insufficient air pressure or air leaks. • The clamping control valve is not working.	• Replace the pneumatic pedal. • Check the clamping device pressure regulator. • Remove any air leaks.	
		• Replace the solenoid valve or check the electrical connection. • Check / replace the valves.	
The machine is running, but when the two-hand control buttons are pressed nothing happens.	• The two buttons aren't being pressed simultaneously. • The buttons don't work. • The safety valve of the two-hand control system is not working. • Air leakage from the system.	• The buttons must be pressed simultaneously. • Check that the buttons are working.	
		• Check the operation of the safety valve on the manual control system. • Remove any air leaks in the pneumatic system.	
The machine is running, but when the two-hand control buttons are pressed the cutting unit does not come down.	• The main cylinder check valve is not working properly. • The cylinder blocking valve isn't working. • Air leaks in the pneumatic system.	• Check/replace the main cylinder control valve. • Check the pneumatic circuit of the cutting unit's UP/DOWN pilot valve. • Check the correct operation and opening of the main cylinder blocking valve. • Remove any air leaks in the pneumatic system.	

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Problem / malfunction	Cause	Remedy / solution	Authorized operator
The cut workpiece is full of burrs.	• The blades are not sharp • The support blocks are incorrectly positioned or the cut is worn.	• Sharpen / replace the blades. • Position/replace the support blocks.	
The mitre joints on the finished frame remain open (inner or outer part of the corner).	• The cutting angle of the two blades is not precisely 45°. • The mouldings being cut were not inserted straight and the base surface is not level. • The tightness has not been adjusted correctly.	• Correct / adjust the blade angle. • Check the pressure and position of the vertical clamping devices. • Replace the workpieces with others of better quality. • Try using the horizontal clamp.	
The corners on the assembled frame are correct but the two adjoining sections are open in the upper section.	• The blades are not vertically aligned. • The mouldings being cut were not inserted straight and the base surface is not level. • The tightness has not been adjusted correctly.	• Correct / adjust blade verticality. • Check the pressure and position of the vertical clamping devices. • Replace the workpieces with others of better quality.	
The cut finish is uneven. The cut pieces are chipped.	• The blades are not sharp. • The blades are warped. • Abnormal vibrations. • Inadequate clamping of the workpiece. • Inadequate cutting speed (blade descent). • Inadequate quality of the material to be cut. • Blade not suitable for the type of material to be cut.	• Check the regularity of the blade unit movements. • Check tightness of the material being processed. • Adjust the cutting speed (blade descent) to suit the type of material. • Use a blade type which is suitable for the material being cut. • Check the quality of the material being processed.	
		• Sharpen / replace the blades. • Check/replace the hubs. • Check/replace the belts and check the drive system. • Check the blade unit balancing system.	

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6 APPENDIX DOCUMENTATION

CONTENTS

6.1. LIST OF DOCUMENTS IN THE APPENDIX

- CE Declaration of conformity
- Machine acceptance testing sheet
- Spare parts catalogue.
- Operating manual for SMC AME 350 oil separator filter element for IN502 flow meter.

6.2. LIST OF DIAGRAMS IN THE APPENDIX

- Electrical diagram.
- Pneumatic diagram

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ALFAMACCHINE S.r.l.
Via Marie Curie e Pierre, 3 - 47122 Forlì - FC -
Tel. +39-0543/783301 Fax +39-0543/783302
http://www.alfamacchine.com