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Rover K FT

1224; 1236; 1531; 1536; 1836; 2231; 2243

NC processing centre

User Manual

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Index

Introduction.....	9
1. Safety information.....	17
1.1. Main safety warnings	17
1.2. Safety devices.....	19
1.3. Danger signs.....	20
1.4. Residual risks.....	21
2. Main parts	22
2.1. General description of the machine	22
2.2. Models	22
2.3. General overview and main parts	23
2.4. Work table	30
2.5. Loading / unloading unit.....	32
2.6. Operating section.....	34
2.7. Air conditioner	40
2.8. Uninterruptible power supply (UPS)	40
2.9. Identification of the manufacturer and the machine.....	41
3. Basic information	42
3.1. Guideline indications	42
3.2. Cartesian axes and co-ordinates	43
3.3. Machine axes.....	44
3.4. Origins.....	46
3.5. Working areas.....	48
3.6. Stop lines	49
3.7. Information on the spindle direction of rotation.....	49
3.8. Slot, Tp.....	50
3.9. 3D Carving & Milling Applications.....	51
4. Intended Use	52
4.1. How to load and unload a piece	52
4.2. Features and dimensions of workable materials	52
4.3. Executable machining operations.....	54
4.4. Work area	56
4.5. Danger area	56
4.6. Unauthorised use.....	57
5. Commands and indicator devices	58
5.1. Arrangement of controls and signaling devices	58
5.2. Control panel.....	59
5.3. Indicator lamp	65
5.4. Machine axis control button pad	66
5.5. Hand-held terminal RM850	67
5.6. bPad Terminal.....	71

5.7.	Loading pallet button pad	73
5.8.	Unloading belt button pad	74
5.9.	Button to reset the photocell barrier	75
5.10.	Safety fence reset button pad	76
5.11.	Unloading button pad	77
5.12.	Bar code reader	78
6.	Operation and use	79
6.1.	Switching on the machine	79
6.2.	Zero-setting the machine axes	80
6.3.	Moving the machine axes	80
6.4.	Operating section warm-up cycles	81
6.5.	Checking the electrosindle temperature	82
6.6.	Machine stop	82
6.7.	Restoring the machine	84
6.8.	Interrupting the program	85
6.9.	Stopping the program with the loading/unloading unit in use	85
6.10.	Restarting the program after an emergency stop	85
6.11.	Switching off the machine	86
6.12.	Using the Presetter device	87
6.13.	Using the RM850 hand-held terminal	89
6.14.	Using the bPad terminal	90
6.15.	Using the bar code reader	91
6.16.	Detachment device unit adjustment	92
7.	Using the safety devices	96
7.1.	Emergency stop button	96
7.2.	Main switch	97
7.3.	Emergency cord	98
7.4.	Busy unloading belt photocell	99
7.5.	Loading pallet photocell barrier	99
7.6.	Photocell barrier	100
7.7.	Operating section guards	101
7.8.	Safety fence	102
7.9.	Compressed air cut-out valve	103
7.10.	Key-activated commands	104
8.	Carrying out machining operations	105
8.1.	Warnings for correct machining operations	105
8.2.	Changing the machine axis movement speed	108
8.3.	Changing the spindle rotation speed	108
8.4.	Procedure to carry out the machining operation with the loading/unloading unit	109
8.5.	Unloading machined pieces	110
8.6.	Procedure to carry out a machining operation without the loading/unloading unit ..	111
8.7.	Program simulation	111
8.8.	Activate stop line	112
8.9.	Selecting the origin	112
8.10.	Locking the piece on the work table	113
8.11.	Starting the machining operation	116
8.12.	Activation of piece movement devices	117
8.13.	Piece unlocking and unloading	117
8.14.	Machine monitoring - Sophia IoT	117
8.15.	Spoilboard thickness management	117

8.16.	Levelling the spoilboard	118
8.17.	Managing the operating section parking mode	119
9.	Troubleshooting	120
9.1.	Problems, causes and solutions	120
10.	Preparing the operating section	124
10.1.	Installing tools	124
10.2.	Characteristics of the installable tools	126
10.3.	Checking the electrospindle tool locking	127
10.4.	Boring tools	131
10.5.	Cutting tools	132
10.6.	Installing the tools in the electrospindle	132
10.7.	Installing the aggregates in the electrospindle	133
10.8.	Installing the tools in the collet spindle	134
11.	Preparing the magazines	136
11.1.	Preparing the Rack tool magazine	136
11.2.	Preparing the Moving tool magazine	137
11.3.	Tools and aggregates that can be used, and their direction	137
12.	Preparing the work table	138
12.1.	Installation of suction cup supports	138
12.2.	Installing the shapeable suction cups	138
12.3.	Installing the gasket on the shapeable suction cups	139
12.4.	Creating the piece locking areas on FT table	139
12.5.	Installing the stop extensions	140
12.6.	Preparing spoilboard	141
12.7.	Installing the clamp stop plates	142
13.	Adjustments	143
13.1.	Unloader adjustment	143
13.2.	Tightening the emergency cord	144
13.3.	Adjusting the Pre-setter	144
13.4.	Adjusting the labelling machine parameters	145
13.5.	Adjusting the label applicator	146
14.	Maintenance	149
14.1.	Warnings relating to machine maintenance	149
14.2.	Forced lubrication	149
14.3.	List of the maintenance operations to be carried out on the machine	150
14.4.	Updating the anti-virus system	152
14.5.	General cleaning of the machine	153
14.6.	Cleaning the machine guides and racks	153
14.7.	Pressure check	154
14.8.	Topping up the grease level	155
14.9.	Topping up the lubrication pump	156
14.10.	Replacing the outer gasket of the shapeable suction cups	157
14.11.	Loading pallet lubrication	158
14.12.	Roller presser support lubrication	159
14.13.	Interventions on the operating section	159
14.14.	Labelling unit interventions	166
14.15.	Interventions on the FR unit	171

14.16.	Interventions on the electrical cabinet.....	173
14.17.	Interventions on the Busch Mink vacuum pump	174
14.18.	Operations on the Becker VTLF2.250 vacuum pump.....	177
14.19.	Interventions to the Becker U 5.301/U 5.101 vacuum pump	179
14.20.	Interventions on the Busch vacuum pump	184
14.21.	Comparative lubricant table	187
14.22.	Interventions on the refrigerator	187
14.23.	Heat exchanger maintenance operations	191
15.	Technical characteristics	194
15.1.	Main machine axes X, Y, and Z	194
15.2.	Types of electrospindles	194
15.3.	Collet spindles	194
15.4.	Boring unit	195
15.5.	C-axis	196
15.6.	Dimensions of the shapeable suction cups.....	196
15.7.	Layout to adjust the loader / unloader.....	197
15.8.	Layout to adjust tools stroke	198
15.9.	Layout to adjust presser roller	198
15.10.	Working field in X-Y	199
15.11.	Working field in Z	199
15.12.	Noise level.....	199
16.	Transport.....	200
16.1.	Notices on lifting and unloading the machine	200
16.2.	Lifting the machine	201
17.	Installation	205
17.1.	Warnings regarding machine installation	205
17.2.	Machine layout, connection points and working dimensions	206
17.3.	Installation area requisites	208
18.	Decommissioning – Demolition	212
18.1.	Decommissioning	212
18.2.	Demolition	212
19.	Guarantee and customer service.....	213
19.1.	Warranty	213
19.2.	Customer service	213

Introduction

This document, together with the Interface User Manual and any attachments, provides the information required for proper machine use and is designed for the operator. The operator is responsible for using the machine, and must have received appropriate training.

To avoid any incorrect manoeuvres that may endanger people, it is important to read and fully understand all the documents that come with the machine. The manufacturer cannot be held responsible or legally liable for any damage resulting from incorrect use of the documentation.

The description or illustration of certain devices may differ slightly from the actual ones without in any way compromising their comprehension. Some devices indicated and described in this manual may not be fitted on your machine.

This document complies with the indications of:

- Machinery Directive 2006/42/CE.
- Supply of Machinery (Safety) Regulations 2008.

Conventions

The parts of the text requiring special attention are highlighted and preceded by the symbols illustrated and explained below.



The paragraphs marked with this symbol indicate an imminent danger, and the contents must therefore be carefully taken into account in order to prevent serious accidents.



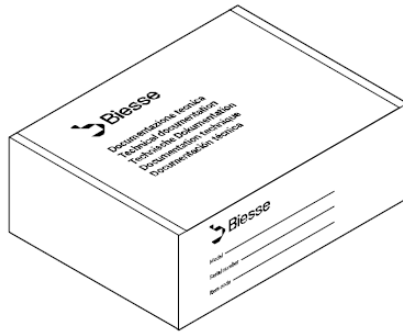
Paragraphs marked with this symbol indicate procedures to be used and conducts to be followed in order to avoid any damage to goods and property.



This symbol is used to indicate points of particular importance that must not be overlooked.

Documents supplied with the machine

The documents supplied with the machine must be kept safely throughout the machine's working life, and must be passed on to third parties on sale. They must be stored in a suitable place within easy access of and known to the persons using the machine.



Based on the machine model or configuration, some of these documents might not be present.

The following is a list of the documents supplied with the machine:

- **User instructions:** contain information for using the machine. Given the complexity of the subjects dealt with, this information may be divided into a number of sections.
- **User interface instructions:** contain information for using the machine user interface. Given the complexity of the subjects dealt with, this information may be divided into a number of sections. This document might be supplied in digital format, integrated in the interface.
- **Pneumatic diagrams booklet:** the diagrams describe the pneumatic systems of the machine, and are aimed exclusively at specialised technical personnel authorised by the manufacturer. They are not necessarily translated into the language of the country to which the machine is being sent.
- **Wiring diagrams booklet:** the diagrams describe the pneumatic systems of the machine, and are aimed exclusively at specialised technical personnel authorised by the manufacturer. They are not necessarily translated into the language of the country to which the machine is being sent.
- **EC Declaration of Conformity:** certifies that the machine complies with the directives indicated.
- **UK Declaration of Conformity:** certifies that the machine complies with the regulations indicated.
- **Layouts booklet:** the layouts contain information about the overall dimensions, the connection points, and any necessary technical specifications. They are aimed exclusively at specialised technical personnel authorised by the manufacturer. They are not necessarily translated into the language of the country to which the machine is being sent.
- **Annexes:** contain further information that completes and/or replaces the information in the document that they are attached.

- **Parts Sophia:** this app contains the spare parts catalogue and the main documents supplied with the machine. Among those documents, the user's manual is supplied in its original language. The app is available both on USB flash drive and on the PC desktop.



EC Declaration of Conformity

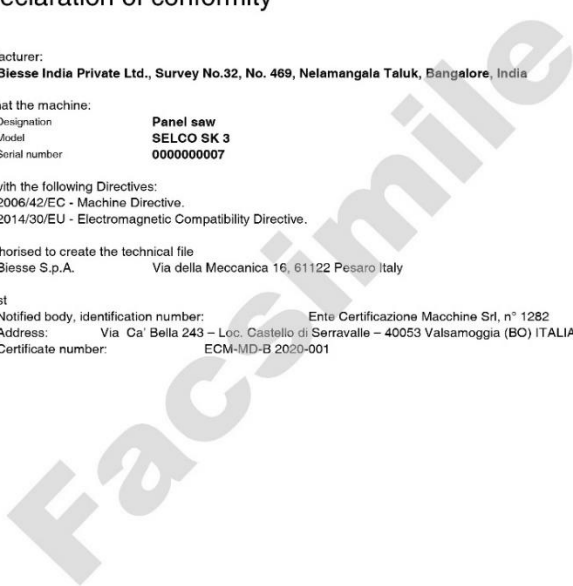
Here below a facsimile and its contents of the EC Declaration of Conformity delivered with the machine:

	Biesse	Biesse India Private Ltd. CIN No. U29299KA2006PTC038415 Registered & Corporate Office: Survey No.32, No. 469, Jakkasandra Village, Sondekoppa Main Road, Nelamangala, Bengaluru Rural District 562 123, Karnataka, India T +91 80 4948 9800 info.in@biesse.com www.biesse.com	Unit 2: Survey No.28/1 & 28/2, Nagarur Village, Huskur Road, Dasanapura Hobli, Bengaluru North Taluk 562 123, Karnataka, India T +91 80 4948 9700
EC Declaration of conformity			
The manufacturer: Biesse India Private Ltd., Survey No.32, No. 469, Nelamangala Taluk, Bangalore, India			
Declares that the machine: Designation Single-sided edgebender Model AKRON 1110 J Serial number 0000000005			
Complies with the following Directives: 2006/42/EC - Machine Directive. 2014/30/EU - Electromagnetic Compatibility Directive.			
Person authorised to create the technical file Biesse S.p.A. Via della Meccanica 16, 61122 Pesaro Italy			
Ahmed Sayeed Special attorney			
Bangalore 04.07.2023			
5810A0001 Inglese			
			

- Company name and address of the manufacturer
- Designation
- Model
- Serial number
- Compliance with directives
- Name and address of the person authorised to prepare the technical folder
- Role and signature of the person authorised to write the declaration
- Place and date of the declaration.

EC Declaration of Conformity

Here below a facsimile and its contents of the EC Declaration of Conformity delivered with the machine:

 Biesse	Biesse India Private Ltd. CIN No. U29299KA2006PTC038415 Registered & Corporate Office: Survey No.32, No. 469, Jakkasandra Village, Sodekoppa Main Road, Nelamangala, Bengaluru Rural District 562 123, Karnataka, India T +91 80 4948 9800 info.in@biesse.com www.biesse.com	Unit 2: Survey No.28/1 & 28/2, Nagarur Village, Huskur Road, Dasanapura Hobli, Bengaluru North Taluk 562 123, Karnataka, India T +91 80 4948 9700						
	EC Declaration of conformity							
The manufacturer: Biesse India Private Ltd., Survey No.32, No. 469, Nelamangala Taluk, Bangalore, India								
Declares that the machine: <table border="0" style="margin-left: 100px;"> <tr> <td>Designation</td> <td>Panel saw</td> </tr> <tr> <td>Model</td> <td>SELCO SK 3</td> </tr> <tr> <td>Serial number</td> <td>0000000007</td> </tr> </table>			Designation	Panel saw	Model	SELCO SK 3	Serial number	0000000007
Designation	Panel saw							
Model	SELCO SK 3							
Serial number	0000000007							
Complies with the following Directives: 2006/42/EC - Machine Directive. 2014/30/EU - Electromagnetic Compatibility Directive.								
Person authorised to create the technical file Biesse S.p.A. Via della Meccanica 16, 61122 Pesaro Italy								
EC type-test Notified body, identification number: Ente Certificazione Macchine Srl, n° 1282 Address: Via Ca' Bella 243 – Loc. Castello di Serravalle – 40053 Valsamoggia (BO) ITALIA Certificate number: ECM-MD-B 2020-001								
								
Bangalore 04.07.2023 LS810L0001 Inglese		Ahmed Sayeed Special attorney 						

- Company name and address of the manufacturer
- Designation
- Model
- Serial number
- Compliance with directives
- Name and address of the person authorised to prepare the technical folder
- EC type test data: the notified body, their address, identification number and the number of the certificate
- Role and signature of the person authorised to write the declaration
- Place and date of the declaration.

UK Declaration of Conformity

Here below a facsimile and its contents of the UK Declaration of Conformity delivered with the machine:

	Biesse	Biesse India Private Ltd. CIN No. U29299KA2006PTC038415 Registered & Corporate Office: Survey No.32, No. 469, Jakkasandra Village, Sondekoppa Main Road, Nelamangala, Bengaluru Rural District 562 123, Karnataka, India T +91 80 4948 9800 info.in@biesse.com www.biesse.com	Unit 2: Survey No. 28/1 & 28/2, Nagalur Village, Huskur Road, Dasanapura Hobli, Bengaluru North Taluk 562 123, Karnataka, India T +91 80 4948 9700
UK Declaration of conformity			
The manufacturer: Biesse India Private Ltd., Survey No.32, No. 469, Nelamangala Taluk, Bangalore, India			
Declares that the machine:			
Designation	Single-sided edgebander		
Model	AKRON 1110 J		
Serial number	0000000006		
Complies with the following Regulations: Supply of Machinery (Safety) Regulations 2008 Electromagnetic Compatibility Regulations 2016			
Person authorised to create the technical file Biesse S.p.A. Via della Meccanica 16, 61122 Pesaro Italy			
Ahmed Sayeed Special attorney			
Bangalore 04.07.2023			
LYSS050001 Inglese			
			

- Company name and address of the manufacturer
- Designation
- Model
- Serial number
- Compliance with regulations
- Name and address of the person authorised to prepare the technical folder
- Role and signature of the person authorised to write the declaration
- Place and date of the declaration.

UK Declaration of Conformity

Here below a facsimile and its contents of the UK Declaration of Conformity delivered with the machine:

 Biesse	Biesse India Private Ltd. CIN No. U29299KA2006PTC038415 Registered & Corporate Office: Survey No.32, No. 469, Jakkasandra Village, Sodekoppa Main Road, Nelamangala, Bengaluru Rural District 562 123, Karnataka, India T +91 80 4948 9800 info.in@biesse.com www.biesse.com	Unit 2: Survey No.28/1 & 28/2, Nagarur Village, Huskur Road, Dasanapura Hobli, Bengaluru North Taluk 562 123, Karnataka, India T +91 80 4948 9700						
	UK Declaration of conformity							
The manufacturer: Biesse India Private Ltd., Survey No.32, No. 469, Nelamangala Taluk, Bangalore, India								
Declares that the machine: <table border="0"> <tr> <td>Designation</td> <td>Panel saw</td> </tr> <tr> <td>Model</td> <td>SELCO SK 3</td> </tr> <tr> <td>Serial number</td> <td>0000000008</td> </tr> </table>			Designation	Panel saw	Model	SELCO SK 3	Serial number	0000000008
Designation	Panel saw							
Model	SELCO SK 3							
Serial number	0000000008							
Complies with the following Regulations: Supply of Machinery (Safety) Regulations 2008 Electromagnetic Compatibility Regulations 2016								
Person authorised to create the technical file Biesse S.p.A. Via della Meccanica 16, 61122 Pesaro Italy								
EC type-test Notified body, identification number: Ente Certificazione Macchine Srl, n° 1282 Address: Via Ca' Bella 243 – Loc. Castello di Serravalle – 40053 Valsamoggia (BO) ITALIA Certificate number: ECM-MD-B 2020-001								
Bangalore 04.07.2023 LYSS050002 inglese		Ahmed Sayeed Special attorney						
								

- Company name and address of the manufacturer
- Designation
- Model
- Serial number
- Compliance with regulations
- Name and address of the person authorised to prepare the technical folder
- UK type test data: the notified body, their address, identification number and the number of the certificate
- Role and signature of the person authorised to write the declaration
- Place and date of the declaration

Warranty

The warranty conditions depend on the contractual arrangements.



Breakdowns caused by non-compliance with the instructions in this manual are not covered by our warranty.

1. Safety information

This chapter contains the main information relating to the safety.



The machine works safely if it is used by properly trained operators in accordance with the recommendations and instructions provided in this manual. The manufacturer will not be liable for any damage to persons or property caused by inexperienced and unqualified operators, or by failure to comply with the following recommendations.

Tampering with the safety devices to carry out unintended machining operations causes grave danger to the operator.

The manufacturer cannot assume any responsibility for damage to people or things resulting from unforeseen uses of the machine, or deliberately incorrect uses.

The manufacturer cannot be held liable for damage to persons or property caused by unauthorised modifications made to the machine.

1.1. Main safety warnings

- The machine has been designed to be used by one operator only. To avoid accidents, the presence of two or more operators on a single machine is absolutely forbidden. The presence of two or more operators is only permitted during piece loading and unloading steps.
- Before carrying out any type of operation, carefully check there is no person near the machine.
- It is absolutely forbidden to climb onto any part of the machine.
- The machine is sufficiently safe only if:
 - all the safety standards governing health and safety at work are respected;
 - all the information on machine use contained in the respective manuals and applied directly to the machine is respected;
 - the operators have been suitably trained in the use of the machine;
 - the residual risks are taken into due account.
- Do not modify the machine's electric system and do not tamper with, elude, eliminate or bypass the safety devices fitted on the machine. Non-compliance with this warning could result in serious risks to the health and safety of persons.
- The machine must only be used for the purpose for which it was designed.
- Wear clothing with an adequate level of protection for the operations to be carried out (goggles, gloves, safety helmet, shoes, etc.).

- Check that all the dust suction hoods are connected to the suction network. Work only with the suction system on.
- Wood machining operations create dust. It is recommended, at the customer's discretion, that you wear a mask with a suitable protection level.
- Wear headsets or ear plugs to protect hearing.
- Before starting the machine, check there is no person inside the danger areas.
- Make sure that nothing will obstruct normal movement of the mobile parts of the machine and that all the casings, doors and protective covers are in their proper places and securely fixed.
- Before starting work, check to make sure that the tools installed in the machine have not been tampered with in any way.
- Always keep the working area clean and tidy.
- Before approaching tools, always make sure they are no longer turning, even in the case of sudden stoppages of the machining operation or to remove chips and sawdust.
- The machine must never be left unattended during operation.
- When handling chemical substances such as lubricants, glues etc., comply with the safety standards for the products in question and refer to the relevant safety data sheets supplied by the respective manufacturers.
- In the case of an accidental interruption in the electricity supply, in order to prevent damage to the electronic equipment, rotate the main switch of the machine to the "0-off" position immediately.

Tools

- Never use deformed or cracked rotating tools.
- Check for perfect balance of rotating tools and make sure they are perfectly sharp and suitable for the work to be performed.
- Grinding wheels cannot be used on the machine.
- Never use tools beyond the speed limit, which is stamped on the surface of the tool or indicated by the manufacturer. If used at rotation speeds higher than those foreseen certain tools might break, causing pieces to fly out of the machine.
- Before installing any tool in its seat make sure that the guide and centring surfaces have no dents and are perfectly clean.
- In each tool apply only the prescribed torque to screws, bolts, nuts and rings.
- When replacing, always make sure the new tool is mounted in the same position as the previous one. Pay particular attention to the direction of cutting edges.
- Tools must always comply with the specifications reported in the instructions for the machine on which they are to be used.
- Don't use aggregates that are different from those referred to in the layout supplied with the machine. If other aggregates are used without any written authorisation, the manufacturer shall not be liable in the event of negligence.
- Only use tools that comply with EN 847-1 and EN 847-2 and EN 847-3 specifications on the machine, and always comply with the specifications for use indicated by the manufacturer.

Tooling, maintenance and repairs

- The machine must be set up by one person only. Ensure that no person else approaches the machine during the set-up operations.
- Never leave tools on the machine when the set-up has been completed.
- Never use petrol, solvents or flammable fluids to clean the parts, use commercially available type-approved detergents that are non-toxic and non-flammable.
- When a repair or maintenance needs to be performed in areas not accessible from the ground, use a ladder or a platform with steps complying with local and national standards.
- In the case of repairs, contact the Service Centre.
- Comply with all applicable standards when disposing of substances and/or parts of the machine. Follow the indications supplied by the respective manufacturers on the safety data sheets.
- Do not work under or near any kinematic systems that have not been appropriately supported and locked in position.
- Do not replace or tamper with any laser projectors that may be fitted on the machine.
- When replacing tools manually, always check they have stopped before you touch them.
- If an inverter error occurs, make sure there are no tools in rotation, before approaching the machine.
- Chips and dust must regularly be removed in order to prevent the risk of fire.
- If the remote assistance function is used, operations performed from the remote location must be authorised by the client.
- To ensure correct machine operation, components must always be replaced with original spare parts.

1.2. Safety devices

The machine is equipped with various devices that increase the level of safety. For information on the operation and use of these devices, refer to the chapter regarding safety devices.

1.3. Danger signs

The following describes and illustrates the danger signs present on the machine.



DANGER - Live components! Before carrying out any operations on the electrical system, make sure that the power supply has been turned off.



DANGER - Hot surfaces! Wear suitable protective clothing.



DANGER - Chopping!



DANGER - Crushing!



DANGER - Area!



Compulsory safety gloves



Refer to the user manual



DANGER - Magnetic fields



PROHIBITION - access with pacemaker



DANGER - Danger area



DANGER - Crushing



The safety signs affixed to the machine must be kept undamaged and clean.

1.4. Residual risks

This machine is equipped with protection devices in conformity with:

- Machinery Directive 2006/42/CE.
- Supply of Machinery (Safety) Regulations 2008.

These devices are efficient as long as they are properly used and kept in working order. Despite observance of all the safety regulations and use of the machine according to the rules described in this manual, there may still be some residual risks:

- Accidents caused by incorrect commands given by the operator; always pay great attention when entering data in the machine interface and when operating the machine.
- Injuries or burns caused by tools; handle tools with great care, and always use suitable gloves.
- Ejection of cut-offs; to restrict the risk it is recommended that, wherever possible, the cut piece be suitably fixed.
- Detachment of pieces, as the efficiency of the vacuum locking system depends on the porosity, thickness and size of the piece, as well as the type of tools being used for the machining operation (see cautionary notice in the section "Intended use").

2. Main parts

This chapter provides information on the type of machine, its main and optional parts, and the configuration of the various models available.



Some devices indicated and described in this manual may be optional features and therefore not present on your machine.

2.1. General description of the machine

This machine is a numerical control processing centre designed for “Nesting” and carving.

Nesting

The term "Nesting" refers to the optimised machining operation of a large piece, in order to extract various profiles of different shapes, reducing waste to a minimum.

Carving

3D cutting, machining and sculpting can be used in many different types of projects. It is one of the most impressive capabilities of CNC routers. The Rover K FT machines are designed to have full 3D capability, and the high-speed capabilities of this machine makes it excellent for efficient 3D work.

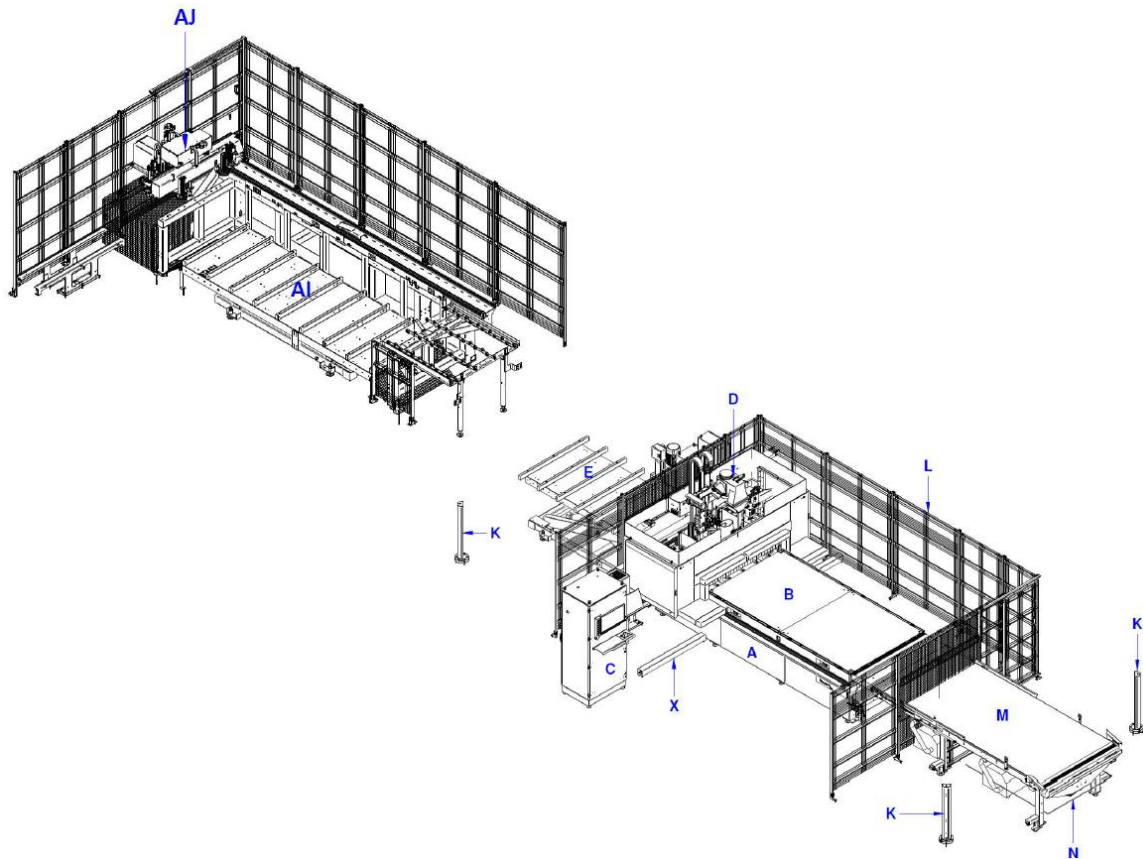
The machine comprises a base, a group of devices that allow the positioning and locking of the piece/pieces to be machined (worktable), and a series of units used to machine the piece (operating section). The operating section can be configured so as to satisfy the various machining needs.

The machine is manufactured with safety systems that meet the regulations in force in the various countries. Machines destined for use in Europe and those countries where Directive 2006/42/EC is applied also bear the EC mark.

2.2. Models

- Rover K FT 1224
- Rover K FT 1236
- Rover K FT 1531
- Rover K FT 1536
- Rover K FT 1836
- Rover K FT 2231
- Rover K FT 2243

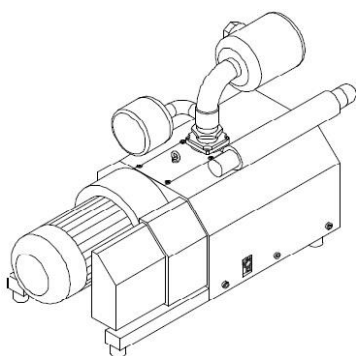
2.3. General overview and main parts



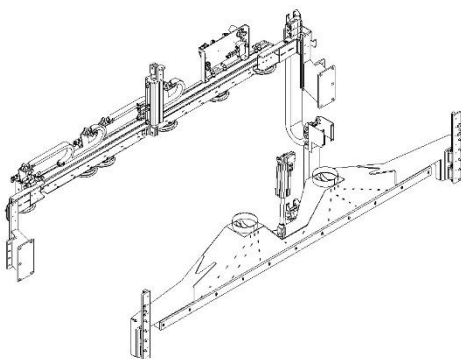
- A Base**; this is the load-bearing structure of the machine.
- B Work table**; for details see **paragraph 2.4**.
- C Electrical cabinet**; contains the main electronic equipment for machine functioning.
- D Operating section**; for details see **paragraph 2.6**.
- E Loading pallet**; for details see **paragraph 2.5**.
- F Rack tool magazine**; for details see **paragraph 2.6.4**.
- G Moving tool magazine**; for details see **paragraph 2.6.4**.

H Vacuum pump; supplies the level of vacuum required to lock the piece to be machined on the work table. The machine may be fitted with a number of pumps of various types, according to the piece locking needs.

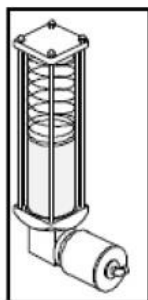
- 250m³/h Becker VTLF2.250 vacuum pump.
- 250m³/h Busch Mink vacuum pump.
- 290m³/h Busch Mink vacuum pump.
- 300m³/h Busch R5 0305 D vacuum pump.
- 300m³/h Becker U 5.301/U 5. 101 vacuum pump.



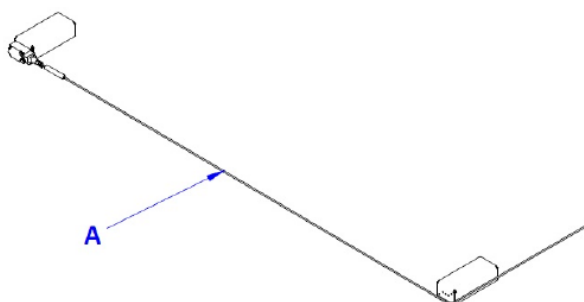
I Loader / Unloader: used to transfer the pieces to be machined from the loading pallet to the FT table, and used to transfer the machined pieces from the FT table to the unloading belt (**see paragraph 2.5**).



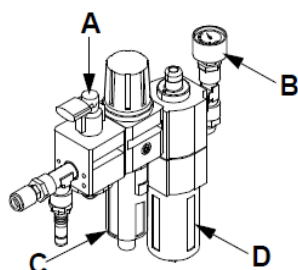
J Lubrication pump: automatically lubricates certain devices (slide blocks, lead nuts, racks, etc.) used to drive the main machine axis carriages. The frequency with which lubrication is performed is set on the numerical control (**see paragraph 14.9**).



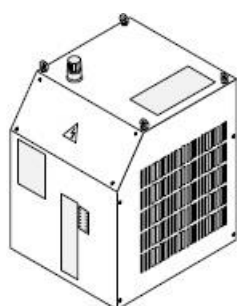
- K Photocell barrier:** for details see paragraph 7.6.
- L Safety fence:** for details see paragraph 7.8.
- M Unloading belt:** contains the machined pieces unloaded from the unloader, for more details see paragraph 2.5.
- N Emergency cord (unloading belt):** for details see paragraph 7.3.



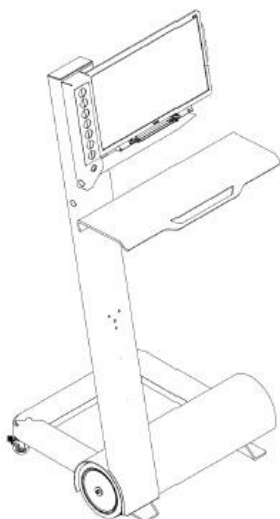
- O FR unit (filter, regulator):** filters the compressed air used by the machine and keeps its pressure constant. It is fitted with a cutout valve **A**, a pressure gauge **B** to check the pressure and two filters: the air filters **C** and the oil separator filter **D**.



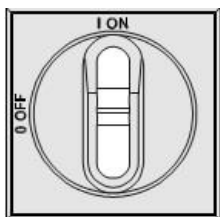
- P Cooler:** Used for cooling down the fluid in the electrospindle cooling circuit, (for details, see paragraph 14.20).



- Q Console;** contains the main commands that are used to manage machine operation (see paragraph 5.2).

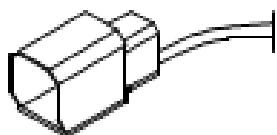


- R Main switch:** for details see paragraph 7.2.



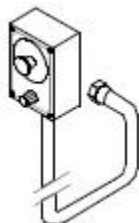
- S Pressure gauges:** allow the pressure in the compressed air system and vacuum system to be checked. For further information see paragraph 14.7.

- T Piece locking pedal;** commands the locking of the piece on the worktable. Each working area is equipped with one pedal.

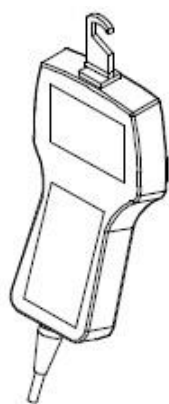


- U Loading pallet button pad;** for details see paragraph 5.7.

V Button pad for controlling machine axes; for details see paragraph 5.4.

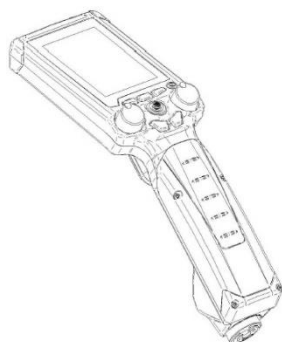


W Hand held terminal RM850; for details see paragraph 5.5.



X Loading pallet photocell barrier: for details see paragraph 7.5.

Y bPad terminal; for details see paragraph 5.6.

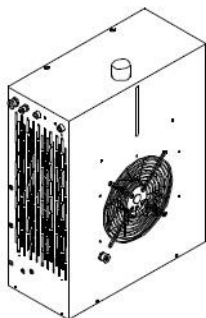


Z Safety fence reset button pad; for the description, see paragraph 5.10.



AA Loader/unloader (Copier type); Used to transfer the pieces to be machined from the loading pallet to the FT table, and to transfer the machined pieces from the FT table to the unloading belt (for details see **paragraph 2.5**).

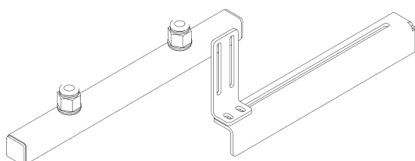
AB Heat Exchanger; used for cooling down the fluid in the electrospindle cooling circuit, (for details, see **paragraph 14.21**).



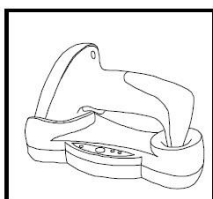
AC Kit for porous panel; for the description, see **paragraph 6.16**.



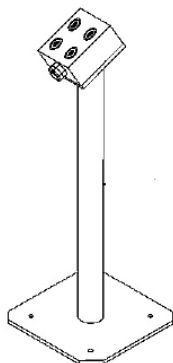
AD Super jet blower; for the description, see **paragraph 6.16**.



AE Bar code reader: for details see **paragraph 5.12**.



AF **Un loading pallet button pad:** for details see **paragraph 5.8.**



AG **Un loading button pad:** for details see **paragraph 5.11.**

AH **Button to reset photocell barrier:** for details see **paragraph 5.9.**

AI **Loading pallet (with labelling unit):** for details see **paragraph 2.5.**

AJ **Labelling unit:** Print out labels.

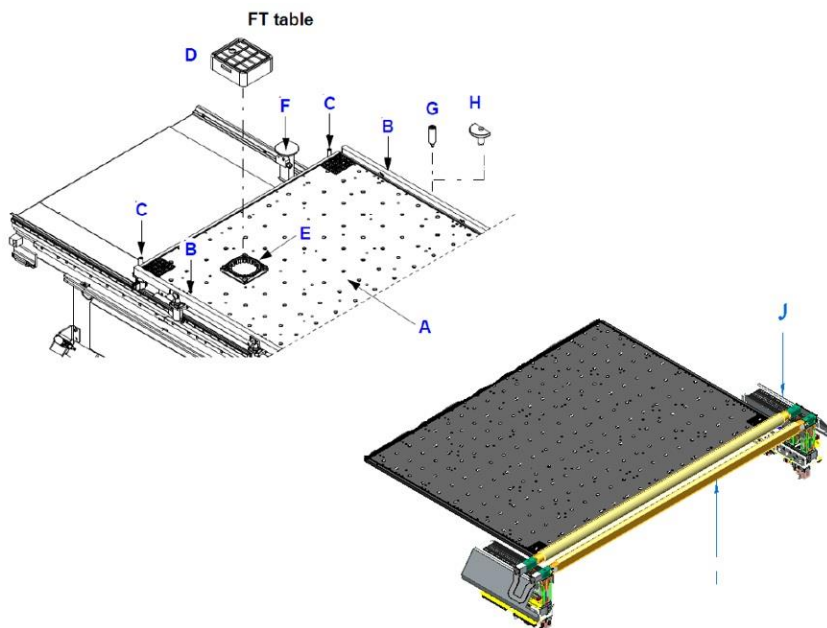


The information concerning the labelling machine is given in the appropriate User Manual. The user guide is available on website of the labelling unit's manufacturer.

2.4. Work table

The work table is the group of parts that are used to position and fix the piece to be machined.

2.4.1. Description of the work table elements



- A. Table:** supports the piece to be machined, blocking it with the help of the positioning and locking devices.
- B. Front stop:** used as a reference when positioning the front or rear side of the piece (according to the stop line used).
- C. Side stops:** used as a reference when positioning the right or left side of the piece (according to the working area being used).
- D. Shapeable suction cup** (piece locking device): supports and locks the piece by means of a vacuum pump. Locking takes place by means of channels formed on the surface of the suction cup, allowing the definition of the area to be de-pressurized via a special rubber seal, so that the piece will adhere to the suction cups. There are different types of shapeable suction cups available that allow, under certain working conditions, locking the pieces more firmly.
- E. Support for suction cups:** holds the shapeable suction cups, allowing them to be changed quickly, to be positioned in the direction of the Cartesian axes X/Y, and to adjust them to 24 different positions.
- F. Presetter:** allows you to measure the length of the tool (digital measuring device). For further information, see paragraph [6.12](#).
- G. Extension for stop:** installed on the stops (in the event of locking on the FT work table with the shapeable suction cup, to increase their length).

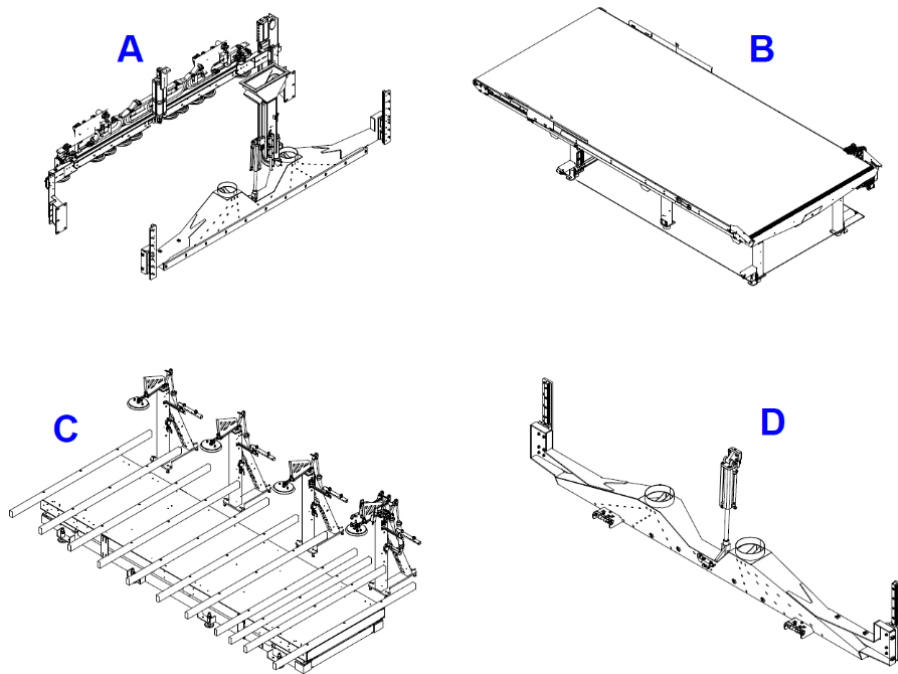
- H. **Clamp stop plate:** installed when required on the stop rods, to allow the locking of the piece. It is normally used when locking small pieces or when it is not possible to use the suction cups.
- I. **Roller presser:** exerts pressure on the piece in a machining operation to prevent it from moving.



The device does not replace the vacuum system; but it further increase its functionality. It is recommended to use the Roller presser in addition to Vacuum to work with porous materials, slightly warped material, stacked panels and small dimension components machining.

- J. **Roller presser support:** supports the roller presser.

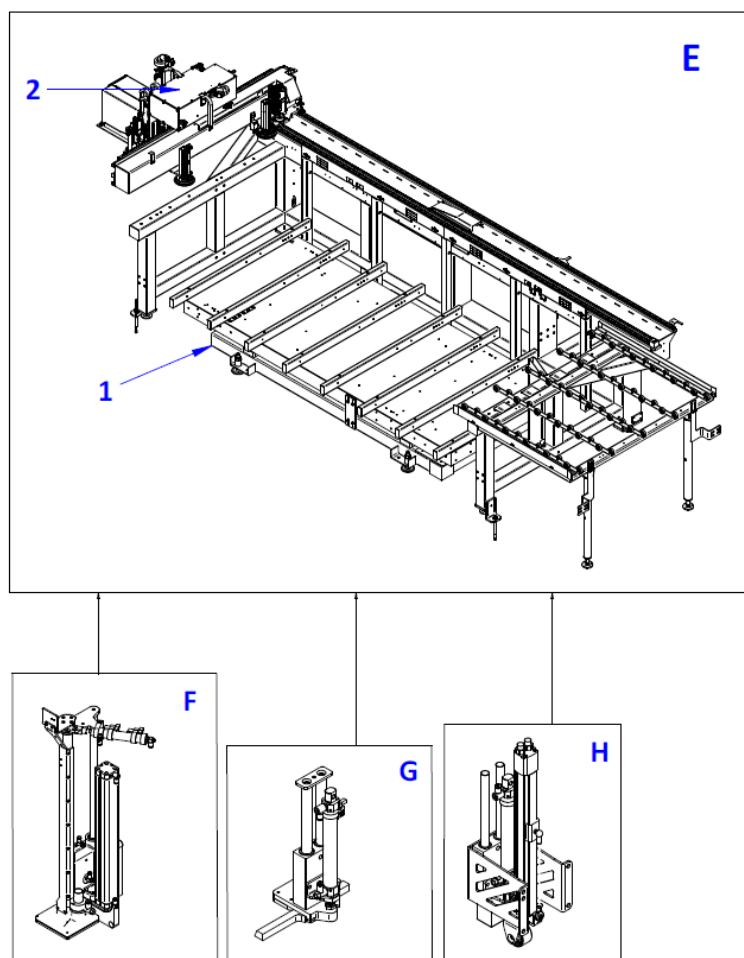
2.5. Loading / unloading unit



- A. Loader/unloader;** Thanks to the help of special suction cups, this device picks the piece up from the loading pallet and moves it, at the end of machining, to the unloading belt.
- B. Unloading belt;** Contains the machined pieces taken from the loader/unloader. It consists of:
- an unloading surface (1).
 - A suction unit (2), to clean the piece during automatic unloading.
- C. Loading pallet;**
- Part of the machine that comprises the stack loading surface (1), containing the pieces to be machined.
 - The front pushers (2) that push the piece to be loaded up against the Y axis.
- D. Loader/unloader (Copier type);** Thanks to the help of couple of wheels fixed behind the unloader, which allows the automatic offloading of "Thin Panels" up to minimum 3mm thickness. This device picks the piece up from the working table at the end of machining, to the unloading belt.

E. Loading pallet (with labelling unit); part of the machine that comprises the stack loading surface (1), containing the pieces to be machined, and the following devices:

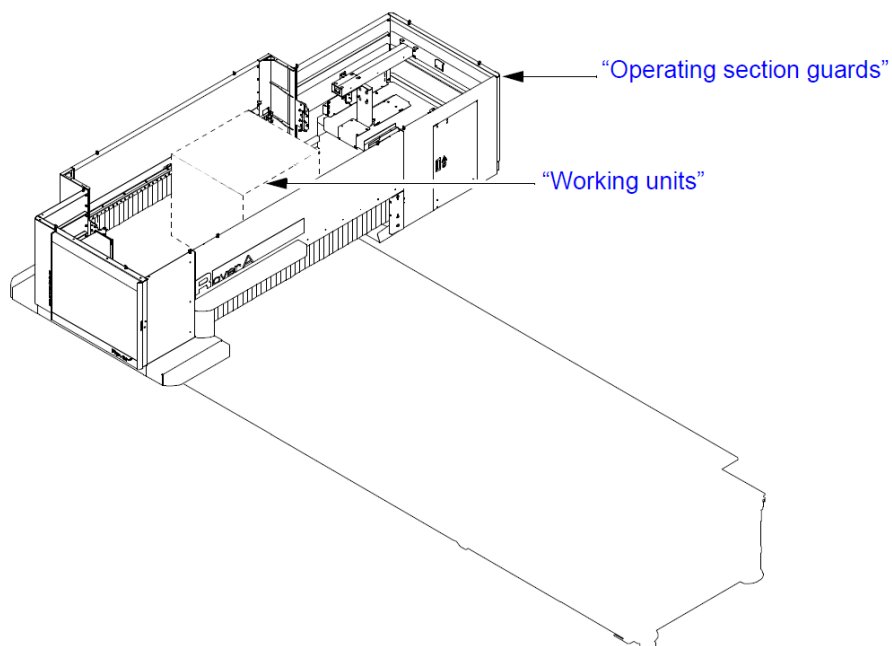
- Label applicator (F);
- Front pusher (G), which automatically pushes the piece against the stops;
- Side pusher (H) that automatically pushes the piece towards the machine. The loading pallet also includes a labelling unit (2).



The information concerning the labelling machine is given in the appropriate User Manual. Labelling machine parameters must be adjusted only if the label applicator does not lift the label and if TEARING and PRINT MODE parameters are not equal to the value pre-set in table (see [paragraph 13.4](#))

2.6. Operating section

The operating section is the totality of the working units and the supplementary devices (ref. **A**). Each working unit is fixed in a pre-set position on the machine Z-axis carriage.

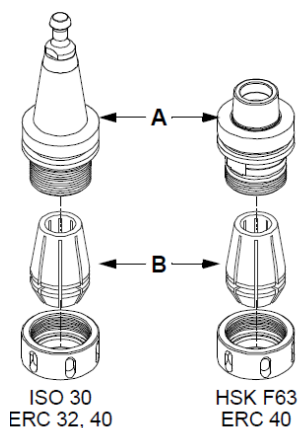


- A** "Working units".
- B** "Operating section guards".

2.6.1. Collet spindles

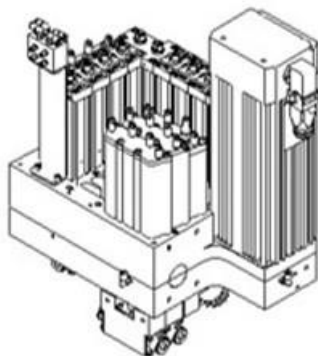
The collet spindles are used in determined working units to quickly change the tool during the machining operation cycle (see chapter “[15 Technical characteristics](#)”). The machine is equipped with collet spindles with ISO 30 or HSK F63 coupling (ref. **A**), to be used with ERC 32 or ERC 40 (ref. **B**) type collets.

There are collet spindles designed for left or right-hand rotation (see paragraph [3.7 “Information on the rotation direction of the spindles”](#)).

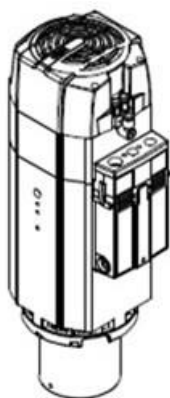


2.6.2. Working units

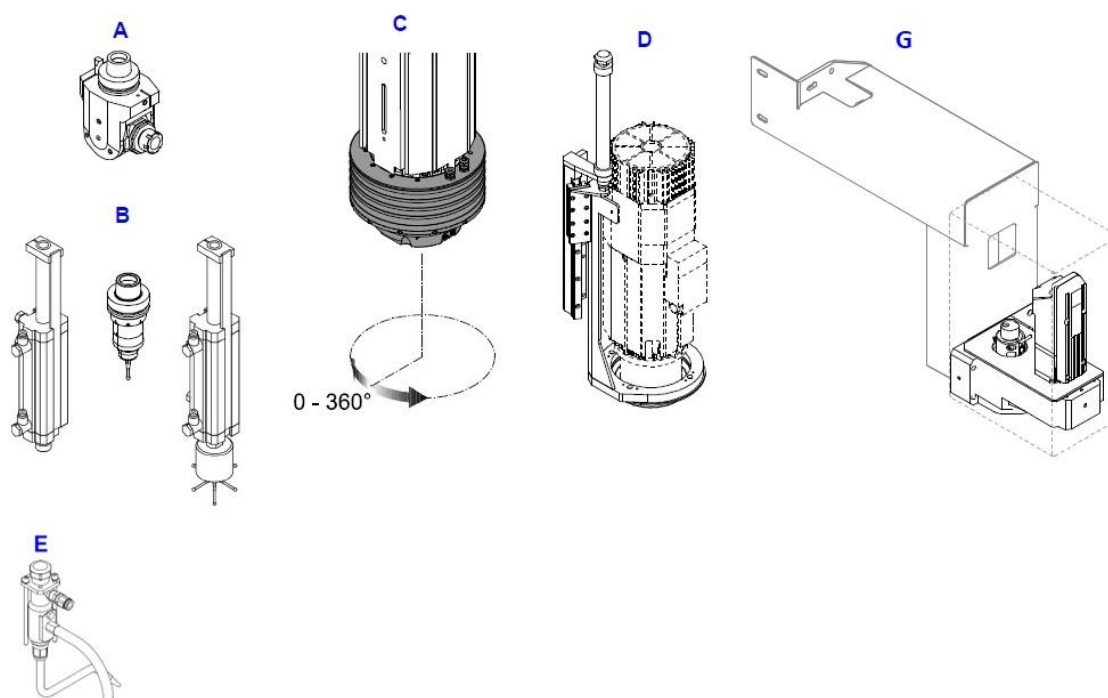
- A. Boring unit;** used mainly to perform series and/or single boring operations. The boring unit is fitted with vertical spindles and chucks with horizontal spindles, and can be fitted with a circular blade chuck to make grooves or sectioning.



- B. Milling unit:** used to perform every type of machining operation with the use of milling tools and aggregates. It is fitted with an electrospindle for rapid tool change during the machining operation cycle, using special collet spindles.



2.6.3. Additional devices for working units



- A. Aggregates:** Supplementary devices equipped with tools (boring, milling, etc.) to be installed in the electrospindles, to carry out various types of machining operation. For further details, see the relevant instruction manuals.
- B. Thickness tracer:** Device to obtain the co-ordinates of a reference point to be used during the machining operation programming.

- C. C-axis:** Device that can be installed on the electrospindle, allowing the aggregate spindle axis to be rotated by 360°.
- D. Presser:** Device that can be installed on the electrospindle to allow a pressure to be applied to the piece being machined. This is used in particular when machining stacked pieces to prevent them from moving.
- E. Ionizer:** The ioniser is a device, which allows ionised air to be delivered by a special nozzle located on the suction hood. Allowing the elimination of static caused by the composition of the materials (particularly plastics).
Static electricity in the chips, as well as potentially causing disturbances in the machine's electric system, tends to make them adhere to the hood and to other machine components in an undesirable way.
The use of the ioniser facilitates suction of the chips, leaving the machine cleaner and improving the quality of the machining operations.
- F. Air-Jet cooling system:** The AirJet is a device, which uses a venturi effect to direct a jet of cooled air, through a nozzle in the suction hood and on tip of the tool during the machining phase.
This allows the temperature of tool and the material being machined to be kept lower, which extends the working life of tool and improves the quality of machining operation.
***Cooling capacity:** 550 Btu/h 139 Kcal/h, 161 Watt/h.
- G. LED pointer:** laser device to detect, on the work table, the reference points where the shapeable suction cups and the piece to be machined must be placed.

2.6.4. Tool magazine

Rack tool magazine

Contains the tools required for machining, which are picked up and set down automatically by the operating section.

This magazine can be fitted with a tool/aggregate identification system (Balluff), which enables the main tool data (length, diameter, rotation speed, etc.) to be read or recorded, using a chip located inside the collet spindles or in the coupling of the aggregates.



Machine Model	Tool places - without loading system
Rover K 1224 FT	10
Rover K 1236 FT	10
Rover K 1531 FT	10
Rover K 1536 FT	10
Rover K 1836 FT	11
Rover K 2231 FT	14
Rover K 2243 FT	14



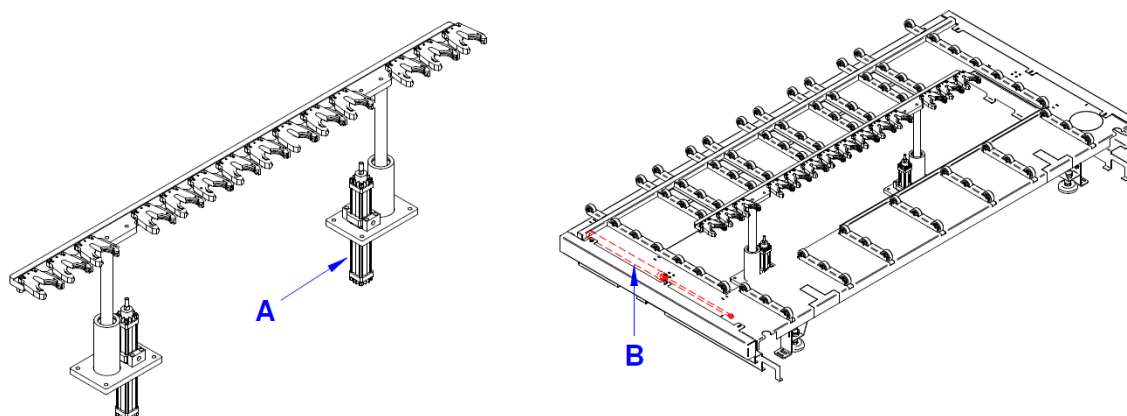
The technical characteristics of the rack tool magazine are indicated in the layouts supplied with the machine (See layouts manual).

Moving tool magazine

Contains the tools required for machining, which are picked up and set down automatically by the operating section.

Cylinder **(B)** with stroke length of **365mm**, which opens & closes the door of link table for the movement of tool magazine. Cylinder **(A)** with stroke length of **215mm**, which moves the tool magazine up and down.

This magazine can be fitted with a tool/aggregate identification system (Balluff), which enables the main tool data (length, diameter, rotation speed, etc.) to be read or recorded, using a chip located inside the collet spindles or in the coupling of the aggregates.



Machine Model	Tool places - with loading system
Rover K 1224 FT	6
Rover K 1236 FT	6
Rover K 1531 FT	9
Rover K 1536 FT	9
Rover K 1836 FT	11
Rover K 2231 FT	14
Rover K 2243 FT	14



The technical characteristics of the moving tool magazine are indicated in the layouts supplied with the machine (See layouts manual).

2.7. Air conditioner

The air conditioner, located on the electric panel door, protects the electrical components from high ambient temperatures (**up to 45°C - 113°F**) and dust. For further information, see the air conditioner user instructions supplied with the machine.

Condensation discharge

The conditioner has a condensate draining pipe. In conditions of particularly high air humidity, a small quantity of water may be discharged from the pipe. This is normal, so you are advised to position a container to collect the water.

2.8. Uninterruptible power supply (UPS)

The UPS is a device designed to protect the computer. It allows data to be saved in the event of a power failure.

2.9. Identification of the manufacturer and the machine

The name and address of the manufacturer are:

Biesse India Private Ltd. - Survey No. 32, No. 469, Jakkasandra Village, Sondekoppa Main Road, Nelamangala, Bengaluru Rural District 562 123, Karnataka, India.

The manufacturer and the machine are identified by means of the plates provided. The plates indicate the information listed below and, where required, the CE mark.

- A Logo
- B Company name and address
- C UK authorised representative
- D compliance mark
- E Designation
- F Model
- G Serial number
- H Year of construction
- I Pneumatic air supply
- J Suction flow rate
- K Machine mass
- L Wiring diagram number
- M Mass of the electrical cabinet
- N Supply voltage
- O Current at full load
- P Number of supply phases
- Q Power
- R Frequency
- S Short-circuit cut-out power at the supply voltage.

BIESSE made in India
 BIESSE INDIA PRIVATE LTD. Survey N°32, N°469, Nelamangala Taluk
 Bangalore 562123 India ☎ + 91 8049489800
 IMPORTER (only for UK): BIESSE GROUP UK LTD - Lonsport Drive, GAINSBURY, WYTHAM, MK11 8Y2 - UK ☎ +44(0)1237 383996

Designazione		
Modello		
Model		
Matricola		
Serial number		
Anno di costruzione		
Year of construction		
Alimentazione pneumatica		Bar
Air supply		
Velocità aria di aspirazione		m/sec
Suction flow rate		
Massa		kg
Weight		

BIESSE made in India
 BIESSE INDIA PRIVATE LTD. Survey N°32, N°469, Nelamangala Taluk
 Bangalore 562123 India ☎ + 91 8049489800

Designazione		
Modello		
Model		
Matricola		
Serial number		
N. Schema elettrico		
Wiring diagram number		
Massa		Kg
Weight		
Tensione di alimentazione		VAC
Power supply voltage		
Corrente a pieno carico		A
Full-load current		
Numero fasi di alimentazione		
Number of power supply phases		
Potenza		kW
Power		
Frequenza		Hz
Frequency		
Potere di interruzione del corto circuito alla tensione di alimentazione		kA RMS Sym at power supply voltage
Suitable for use on a circuit capable of delivering not more than		

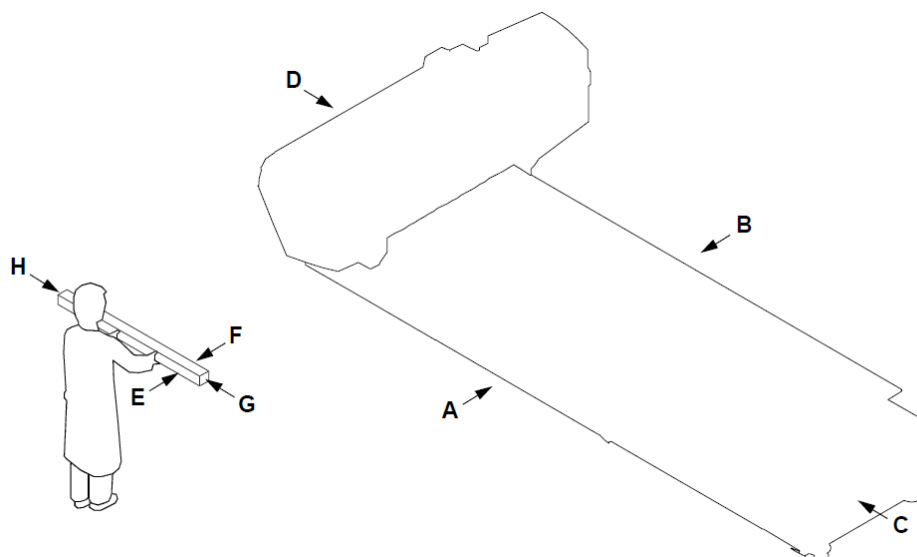
electric system rating plate

3. Basic information

This chapter deals with various subjects that give a clearer understanding on how the machine works.

3.1. Guideline indications

The following figure contains useful guideline indications.

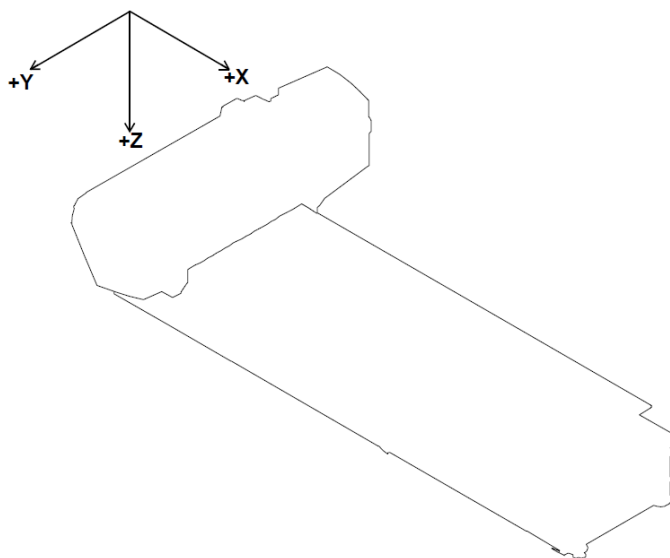


- A** Front side or front of the machine, on which the pieces are loaded and unloaded.
- B** Rear side of the machine.
- C** Right-hand side or right of the machine.
- D** Left hand side or left of the machine.
- E** Front side or front of the piece.
- F** Rear side of the piece.
- G** Right hand side of the piece.
- H** Left hand side of the piece.

3.2. Cartesian axes and co-ordinates

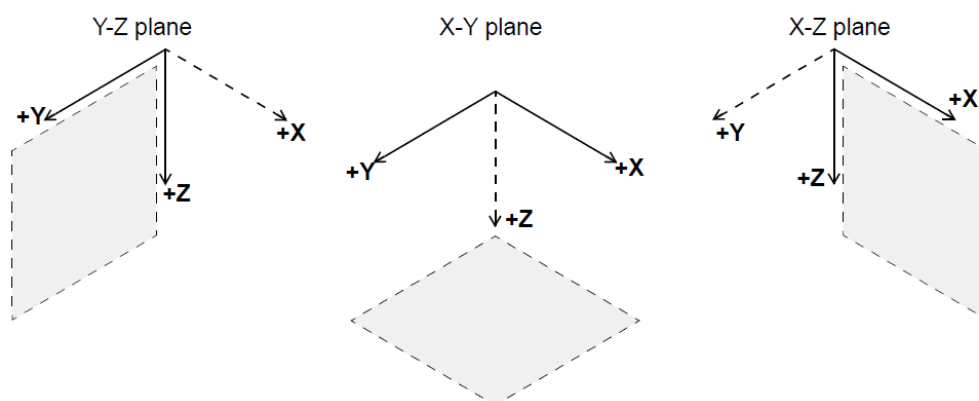
The position and movement of certain parts of the machine are indicated using the Cartesian axes and co-ordinates system. This system is used in geometry to describe the position of a point on a plane or in space using the X, Y, and Z-axes.

The positions of the Cartesian axes with respect to the machine are illustrated below.



Planes of the Cartesian axes

In some cases, a pair of axes in the Cartesian system is used to refer to a particular plane. An example of each plane is shown in the figure below.



3.3. Machine axes

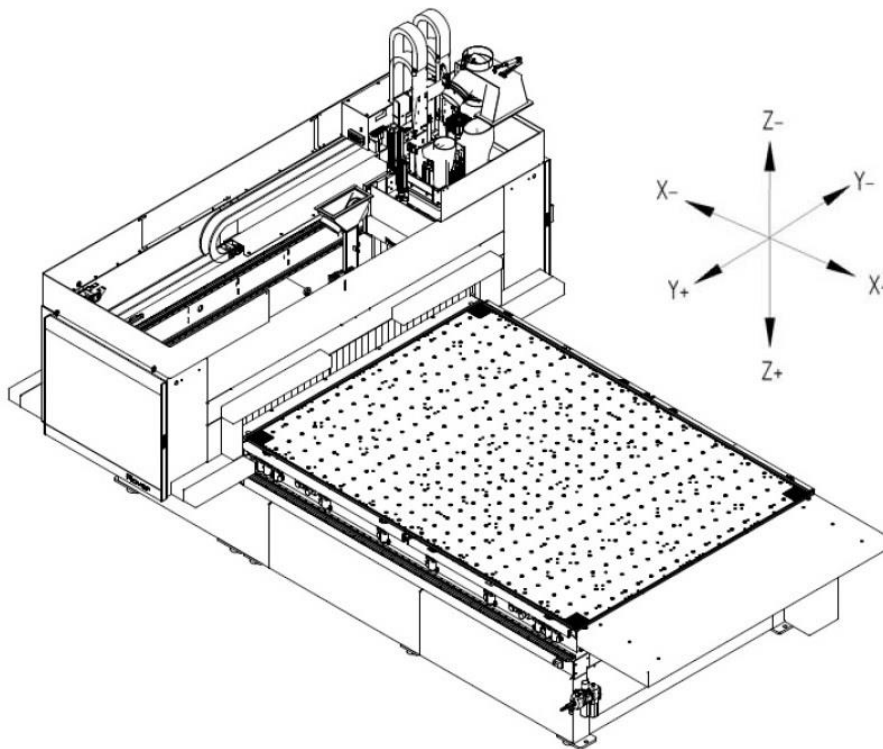
The machine axes are electronically controlled elements that allow the movement of parts or groups of the machine.

The position of the machine axes can be displayed at any time on the numerical control, on the page that normally opens when the software is launched.

3.3.1. Machine co-ordinate axes

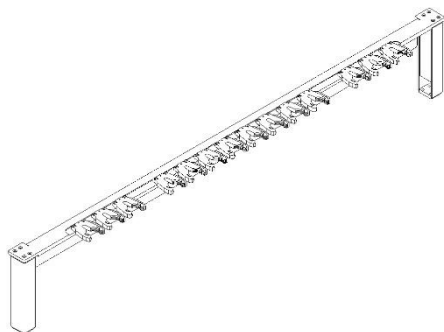
The co-ordinated machine axes drive the machine units that are directly involved in machining the piece (e.g. the operating section), and they can be interpolated.

- **X**; group of parts that move the operating section in the direction of the Cartesian X-axis.
- **Y**; group of parts that move the operating section in the direction of the Cartesian Y-axis.
- **Z1**; group of parts that drives the milling unit electros spindle vertically. Refer to the machine Z- axis for the positive and negative directions of movement.
- **Z2**; group of parts that drives the boring unit vertically. Refer to the machine Z-axis for the positive and negative directions of movement.

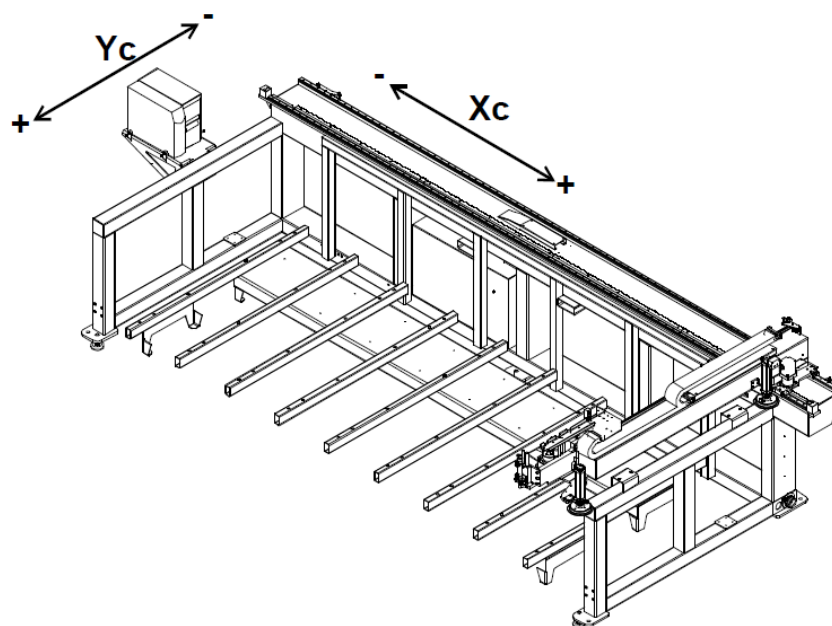


3.3.2. Auxiliary machine axes

The auxiliary machine axes drive the machine units that are not directly involved in machining the piece (e.g. the tool magazine), and they cannot be interpolated.



- **Zc**; group of parts that vertically move the stack loading surface.
- **Yc**: group of parts that moves the loading pallet devices along the Y-axis.
- **Xc**; group of parts that move the loading pallet devices along the X axis.



3.4. Origins

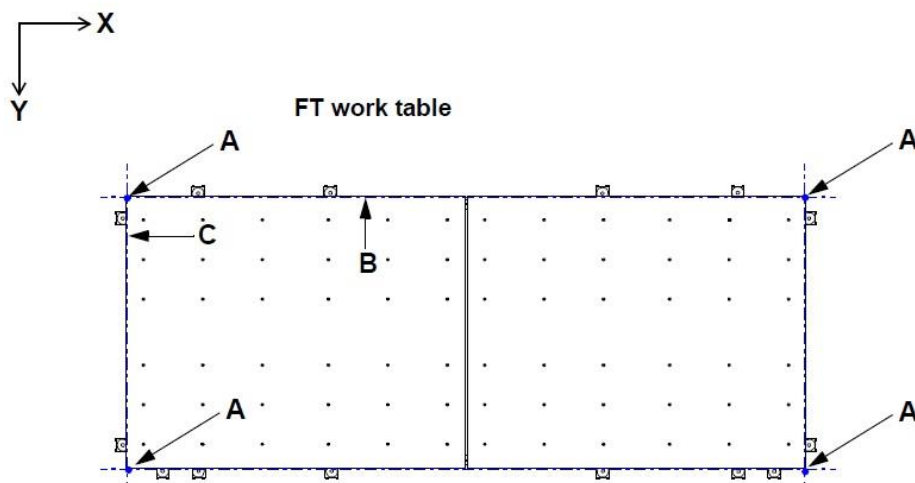
The origin is a pre-set point used as a reference when establishing the position of an element on the machine. The machine has a number of origins: the absolute origin (or machine origin) and the work table origins.

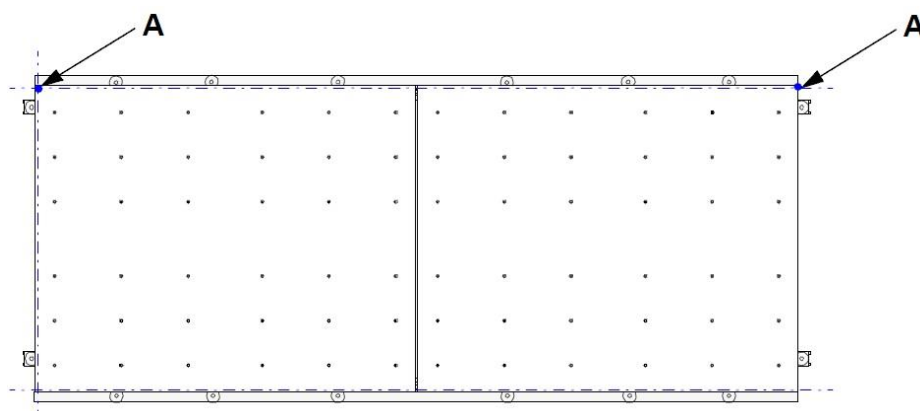
Absolute origin

The absolute origin (or machine origin) is an imaginary point located on the axis of the milling unit, when the latter is reset, at the height of the bottom end (nose). It corresponds to the 0 (zero) point in the system of Cartesian axes and co-ordinates and the main machine axes, and represents the point from which to start when establishing the position of the other origins. It is set by manufacturer when the machine is first tested, using suitably arranged cams, and limit switches.

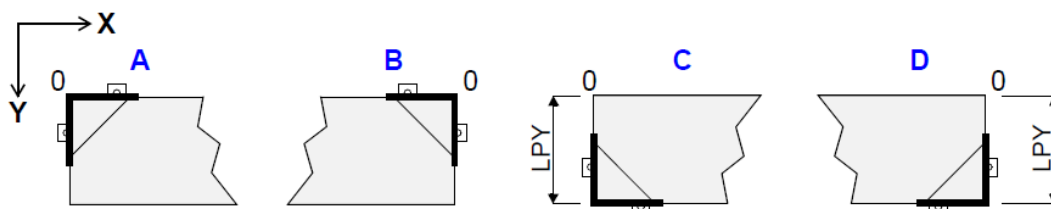
Work table origins

The work table origins are reference points (ref. **A**), for the program positions. In the direction of the Cartesian axes X and Y, these are the intersection point between two imaginary lines, a tangent to the front stop **B** (called "stop line") and the other tangent to the side stop **C**, while in the direction of the Cartesian Z-axis they represent the supporting surface of the piece on the work table.



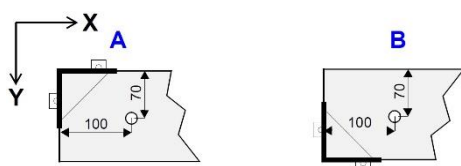


When the machine is fitted with a loader/unloader and the selector “[Unloader enabling](#)” is activated, only these two origins can be used.



- A. Straight origin:** these use the top left hand corner of the piece as a reference point when the rear side of the piece is pushed up against the front stops.
- B. Mirror (or symmetrical) origins:** these use the top right hand corner of the piece as a reference point when the rear side of the piece is pushed up against the front stops.
- C. Translated straight origins:** these use the top left hand corner of the piece as a reference point, when the front side of the piece is pressed up against the front stops. In this case, to make the necessary calculations, the machine uses the dimensions of the piece along the Cartesian Y-axis (LPY), as entered in the program.
- D. Translated mirror origins:** these use the top right hand corner of the piece as a reference point, when the front side of the piece is pressed up against the front stops. In this case, to make the necessary calculations, the machine uses the dimensions of the piece along the Cartesian Y-axis (LPY), as entered in the program.

The following example illustrates a program containing the instructions required to carry out a vertical bore at $X = +100$ and $Y = +70$ and the result obtained on the various origins.



The straight and mirror origins are normally used to create the left and right hand parts of a furniture unit (sides, doors, etc.) with a single program.

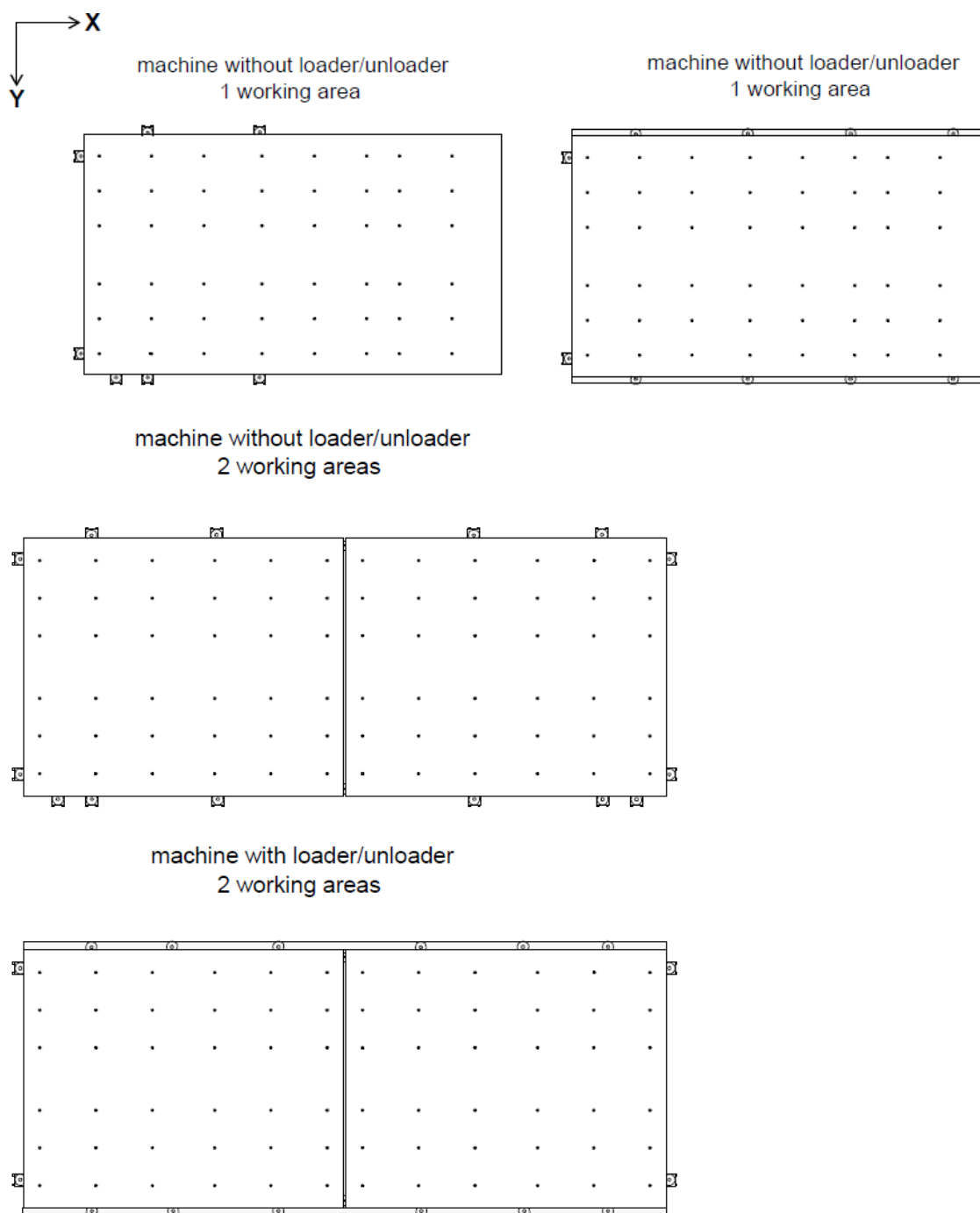
To carry out a machining operation it is necessary to select at least one work table origin.

3.5. Working areas

The working areas are divisions in the table of the work table. It is possible to position and lock a piece to be machined in each of the working areas.

The worktable is divided into various working areas (see figure) that are activated by means of the blocking pedal: one for each area.

Each working area can be divided into a number of locking zones. The locking zones can be activated depending on the size of the piece.

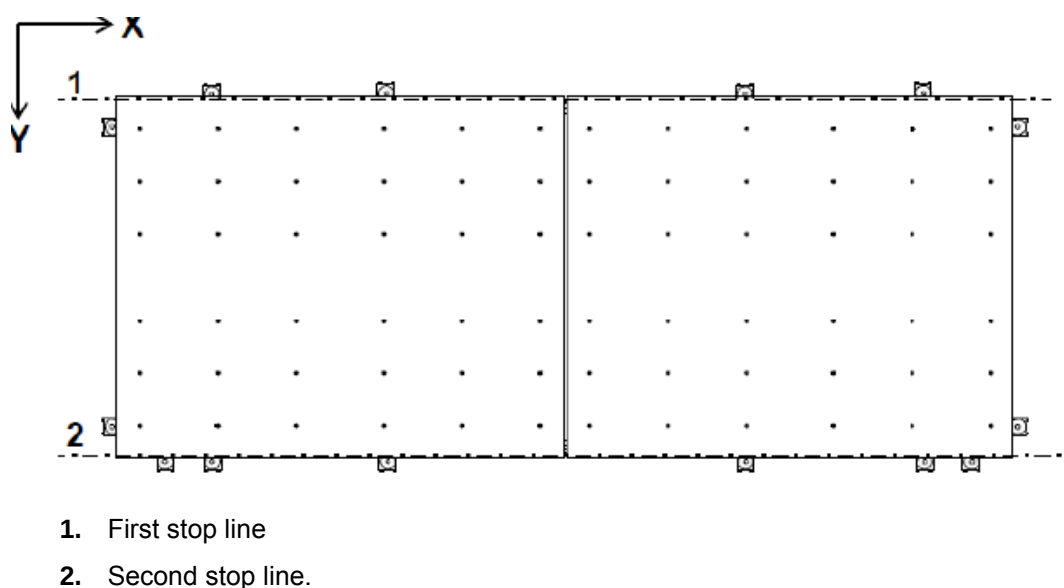


3.6. Stop lines

The “stop lines” are imaginary lines tangent to the front stops or to the clamps. The intersection between a stop line and an imaginary line tangent to the side stops allows an origin of the work table to be defined.

To carry out a machining operation it is necessary to enable a stop line.

FT Work table



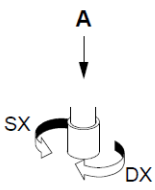
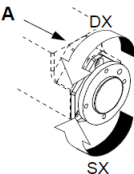
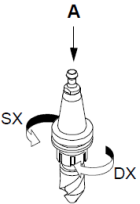
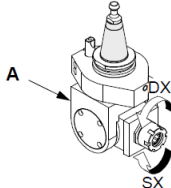
3.7. Information on the spindle direction of rotation

The machine is equipped with various spindles, and it is extremely important, in order to avoid the risks connected with installation of an unsuitable tool, to understand the definition of right or left spindle and be able to determine the rotation direction of each spindle with certainty.

Definition of a right and left spindle

The definition of “right” spindle (DX) is given to a spindle that rotates clockwise, while “left” (SX) is used for a spindle that rotates anticlockwise.

To define the rotation direction of a spindle, you must look at it from direction **A**, as indicated in the figure below.

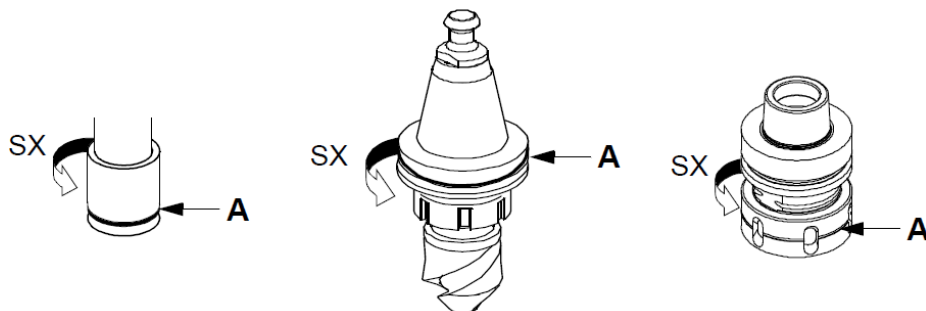
boring spindle	spindle for circular blade	collet spindle	aggregate spindle
			

Determining the spindle rotation direction

Information on the rotation direction of the various spindles is given in “**chapter 15-Technical characteristics**”.

There are, however, conventions that enable the quick determination of spindle rotation direction:

- Red rubber ring = left spindle.
- Black rubber ring = right spindle.



3.8. Slot, Tp

The term “slot” defines the areas where the various working units are installed.

In the numerical control software the slots are identified by the abbreviation “Tp”, followed by the number of the corresponding slot (e.g. for a milling unit located in slot 1 the abbreviation Tp1 will be used). The same abbreviation - TP - is also used to identify the circular blade tool chuck, located on the boring unit. The number used for this chuck varies according to the configuration of the operating section.

3.9. 3D Carving & Milling Applications

Full 3D CNC involves both designing in 3D and during cutting the simultaneous CNC motion in X, Y, and Z axes, which is also known as 3 Axis interpolation. In 3D machining, the CNC cutter tip follows paths at 3D angles or in 3D curves in order to mill or carve complex shapes into the material. In order to do fully sculptural 3D, necessary to think and design a 3D model. This takes full advantage of the CNC tool's capabilities to produce fully contoured shapes milled to the required specifications. The shapes that one can machine are nearly unlimited and adding even a small amount of true 3D to a project can uniquely distinguish it.

When considering working in 3D carving/milling, it is useful to separate the process of design or shape creation, from the tool-path generation process. There are separate software programs to manage these functions, but also some software's that can provide both CAD & CAM capabilities.

3D Design

The first step is to create the 3D shape of your concept in a 3D design system, defining the form that you want to cut. This shape is called a 3D model, and the software programs that do this kind of work are usually called 3D modelling programs (sometimes 3D CAD). Modelling is the right word here, because rather than drawing with lines, you will build up your 3D object by inserting and modifying basic 3D shapes.

3D CAM

A 3D model defines the geometry of the shape that one needs to cut, but it does not tell the CNC tool how to actually move over and around the model in order to cut the shape. The model does not know what size and type of cutter you will be using, how tight you want the resolution, what kind of directions you want to cut in, and so forth. So the next step is to bring the 3D model into a 3D CAM or tool-path generating program to create the Part File that tells the CNC machine how to actually cut the shape. Using the 3D CAM program, we can set up how to cut the part. We can also do other things in the CAM program that may not seem as obvious such as creating separate roughing and finishing passes or defining a machining border around an irregularly shaped part.

As with 3D design, there are a variety of CAM programs that can be used to generate tool paths from 3D models.

Combining 3D Design and CAM

A few software packages combine 3D modelling with CAM features. This gives a more organized approach for doing full 3D work. The most popular CAD/CAM software programs for carving applications are ARTCAM, ARTCAM ART, VETRIC & ASPIRE.

4. Intended Use

This chapter contains information defining the safe and proper uses for which the machine has been built.

4.1. How to load and unload a piece

The machine is not designed to be used in line with other machines. The material to be machined must be loaded and unloaded manually or using suitable devices.

In order to reduce machining times (pendular mode), loading and unloading of the piece can be carried out in one part of the work table while the operating section is machining in the opposite part, as long as the dimensions of the piece in the X-axis permit it.

4.2. Features and dimensions of workable materials

The machine is designed to work for the below materials:

- Wood (solid wood, plywood, fiber panels, stripboard, multiply plywood, veneered sheets).
- Wood derivatives (chipboard, MDF, OSB).
- The materials listed above, coated with plastic laminates or banding materials.



Under no circumstances must the machine be used to work plasterboard, ferrous materials, or materials not mentioned above.

Table shows the maximum dimensions of the workable materials. Values **X** and **Y** correspond to the surface of the piece that rests on the work table, along the respective Cartesian axes X and Y. The **Z** value corresponds to the maximum workable thickness of the piece.

Maximum dimensions of machinable materials.

Machine model	X (mm)	Y (mm)	Z (mm)
Rover K FT 1224	2465	1260	170
Rover K FT 1236	3765	1260	170
Rover K FT 1531	3100	1560	170
Rover K FT 1536	3765	1560	170
Rover K FT 1836	3765	1875	170
Rover K FT 2231	3100	2205	170
Rover K FT 2243	4300	2205	170



The minimum dimensions of the pieces to allow proper locking using the vacuum locking system are not easy to define, as the efficiency of the locking depends on the porosity, thickness and dimensions of the piece, as well as on the type of tool used for the machining operation. Should there be any doubts regarding the efficiency of the standard locking system, it is recommended that auxiliary locking systems (clamp stops, front pushers, etc.) be used. In any event, BIESSE is available for any clarification that may be required.

Piece workability data vary according to the working field of the working unit involved in the machining operation (see layout), as well as the piece's position on the work table, the tool and piece size, and the size of the other working units.

Minimum/Maximum values for the pieces that can be loaded on the loading pallets.

Machine model	Minimum values (mm)	Maximum values (mm)	Maximum weight				
	X	Y	Z	X	Y	Z	Kg
Rover K FT 1224	2200	800	3	2460	1260	80	150
Rover K FT 1236	2200	800	3	3775	1260	80	150
Rover K FT 1531	2200	800	3	3200	1560	80	150
Rover K FT 1536	2200	800	3	3775	1560	80	150
Rover K FT 1836	2200	800	3	3775	1875	80	150
Rover K FT 2231	2200	800	3	3200	2205	80	180
Rover K FT 2243	2200	800	3	4300	2205	80	180



The position of the two loading pallet pushers must be adjusted during installation according to the panels to be machined.



The maximum height of the stack that can be loaded is 490 mm.



The maximum loadable thickness is 170* mm.

* When 9 mm Martyr panel is used.



The maximum loadable thickness is 170* mm.

* When 3 mm Martyr panel is used (for copier type unloader).

4.3. Executable machining operations

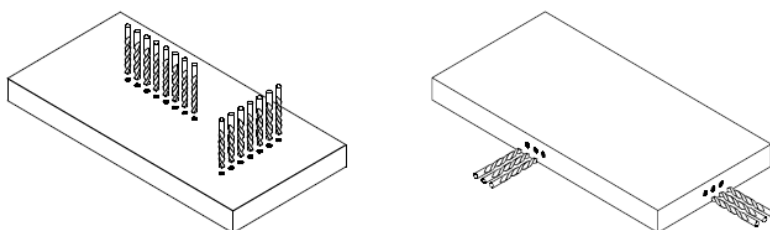
All the machining operations that can be carried out by the machine are described and illustrated below. Some of them can only be carried out using optional units.



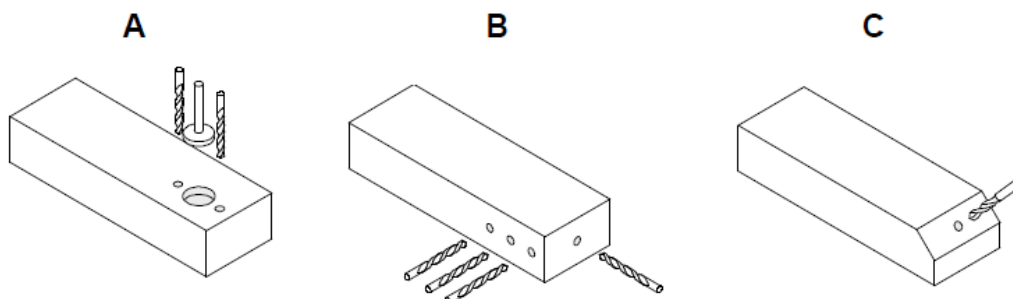
Grinding operations are not allowed on the machine.

Boring operations

- Vertical and horizontal series boring (system boring).

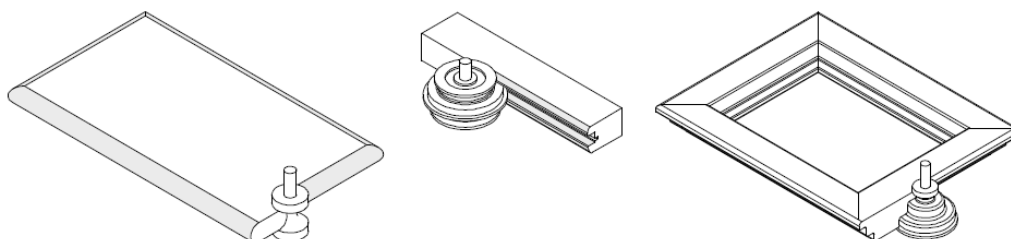


- Vertical A, horizontal B, and tilting tool-boring operations C, for example to make housings for dowels or hardware materials.

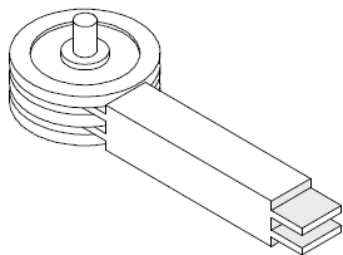


Milling operations

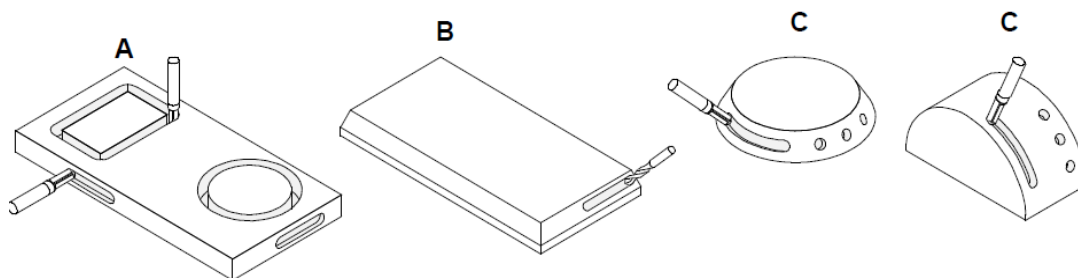
- Creating any type of profile on the edge of the pieces, using special shaped mills (profiling or rebating in the case of pre-assembled doors).



- Creating joints for door and window frame elements (tenoning).

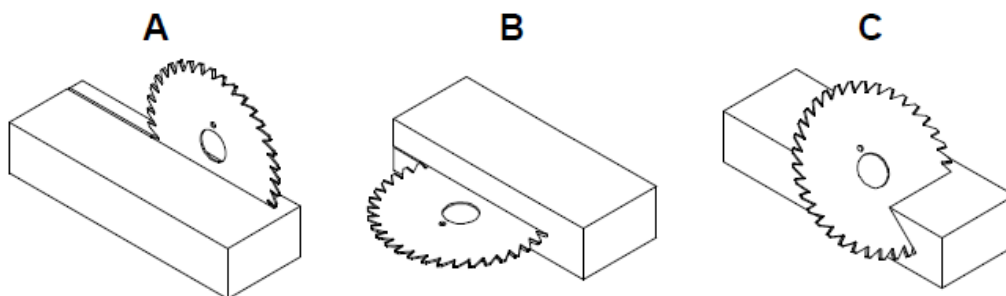


- Vertical A, horizontal B, and tilting engraving C.



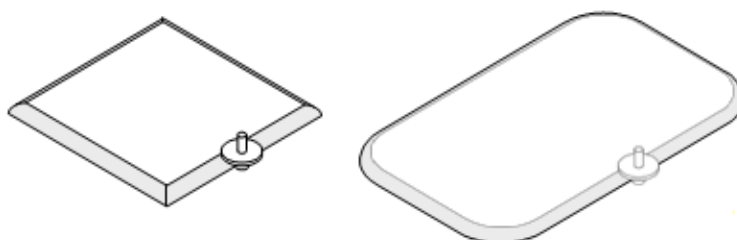
Cuts

- Vertical A, horizontal B, and tilting cuts C.



Smoothing operations

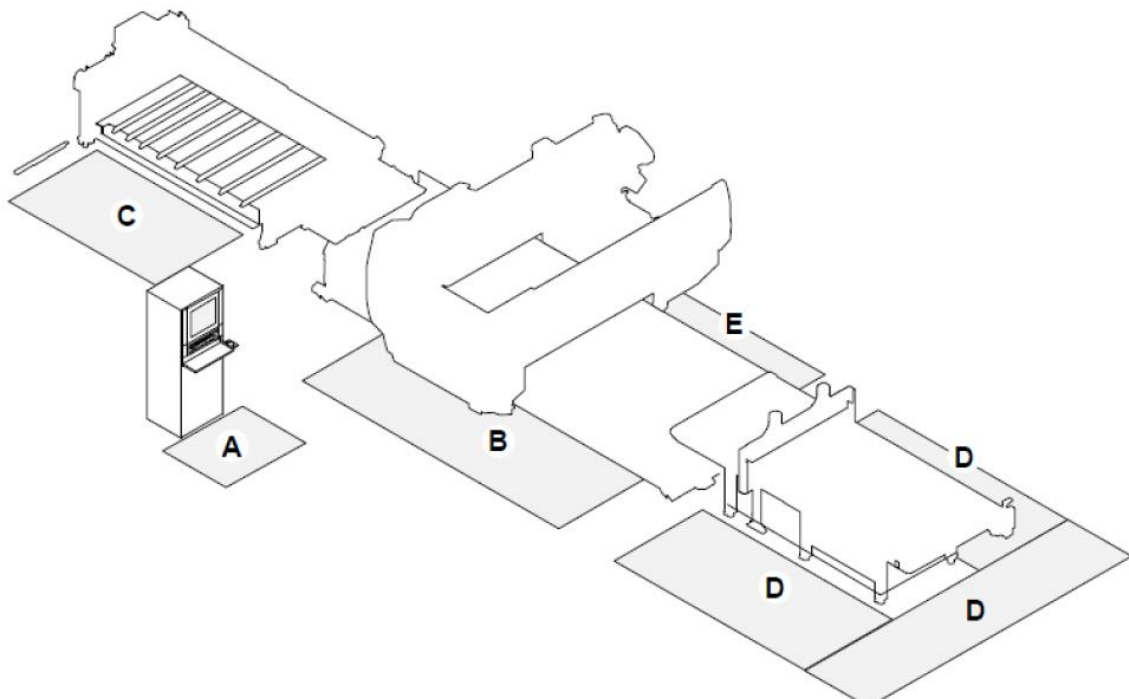
- Smoothing the edges of pieces with squared or curved profiles.



4.4. Work area

"Work area" means the area where it is possible to stand while the machine is working, in order to activate and control the command devices.

- **Area A:** in front of the control panel to use the NC, to activate commands and to oversee the correct functioning of the machine.
- **Area B:** in front of the worktable, for the manual locking of the pieces and the lifting of the pieces at the end of the machining operation.
- **Area C:** in front of the loading pallet, to put down the stack of pieces to be worked.
- **Area D;** in front of the unloading belt to pick up the machined pieces.
- **Area E;** behind the work table, for the manual blocking of the pieces, their lifting and picking up at the end of the machining operation.



4.5. Danger area

The danger area is the whole of the area occupied by moving parts during the machining operation. This area is opportunely delineated by the fence and the photocell barrier.

4.6. **Unauthorised use**

The manufacturer cannot be held liable for damage resulting from a use of the machine not described in this manual.

It is not permitted to use materials not expressly indicated by the manufacturer, or materials not suitable for the type of machining operation for which the machine has been designed.

Materials that exceed the technical characteristics of the machine must not be used. Adhere strictly to the limits indicated.



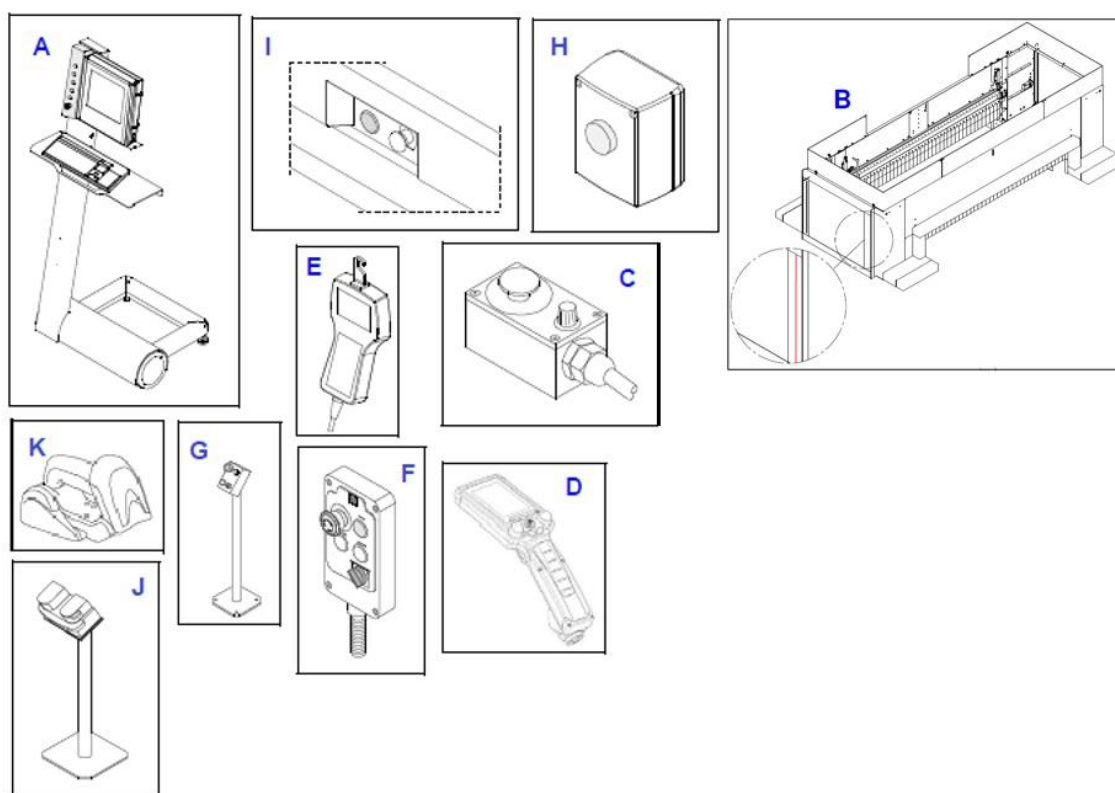
Never use the machine to process plasterboard, ferrous materials, or any other materials not mentioned above.

5. Commands and indicator devices

This chapter describes the controls and signalling devices.

5.1. Arrangement of controls and signaling devices

The command functions are described below:



- A. Control panel
- B. Indicator lamp
- C. Machine axis controlling button pad
- D. bPad terminal
- E. Hand-Held terminal RM850
- F. Loading pallet button pad
- G. Unloading belt button pad
- H. Safety fence reset button pad
- I. Button to reset the photocell barrier
- J. Unloading button pad
- K. Bar code reader

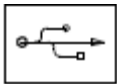
5.2. Control panel

The control panel is used to control the machine's main functions.



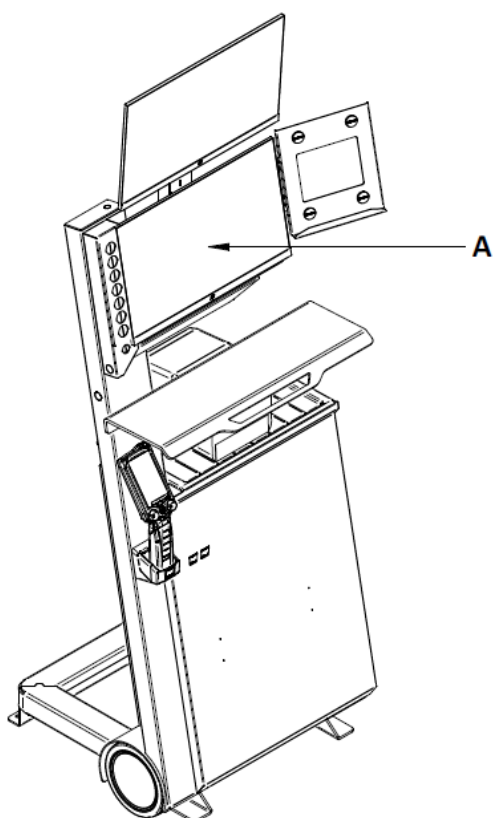
The command functions of the control panel are described below:

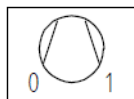
	LH origin program selection (illuminated green button); to select the LH origin side program.
	RH origin program selection (illuminated green button); to select the RH origin side program.
	Tooling ; (key selector) activates the tooling mode for machine set-up. When this function is enabled, only the voltage (24V) required to operate the solenoid valves is available, so that operations can be carried out in safety. When the key is removed, the selector will not turn. With this function enabled, you can open the door of the safety fence. • Position I = function activated • Position 0 = function deactivated
	Start (illuminated white button): to run an operation.
	STOP-RESET (white button without illuminated): stops an operation. If pressed a second time, it resets the PLC.
	Machine power (luminous green button): prepares the moving parts to receive the electricity. • On = function activated.

	STOP (black button): Stops all the machine axes.
	Emergency stop button: see paragraph 7.1
	USB pen drive.

Soft Console

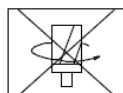
The commands on the Soft Console **(A)** allow you to manage the machine's secondary functions and those relating to certain optional devices.





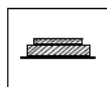
Prevent piece unlocking

Prevents the piece from unlocking (vacuum locking only) in the event of an emergency stop. This function is normally activated when performing milling operations, so that there is no risk that the piece will have to be discarded in the event of a sudden emergency.

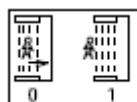


Deactivation of tool rotation;

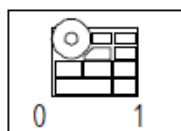
Disables the rotation of the spindle of each unit of the operating section. This function is especially useful during program tests to check machine movements, as the curtain guards are not lowered.



Levelling: used to enable support panel levelling mode.



Speed; (selector) allows to perform machinings using interpolation speed faster than 25 m/min only



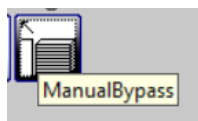
Clamp activation;

Used to activate the clamps.

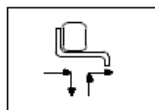
Light off: locking with vacuum

Light on: locking with Uniclamp devices

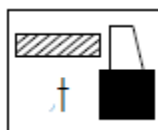
Flashing light: locking with vacuum + Uniclamp



Manual Panel alignment bypass: (key selector) disables and bypass the manual panel alignment condition, for each panel during the program loading cycle for the pre-aligned stacks.



Semi-automatic loading/unloading: if the "unloader enabling" selector is disabled then, at the end of a manual machining cycle, the piece could be unloaded by means of the unloading device. If the "unloader enabling" selector is enabled and this control is disabled then, the piece could be loaded by means of the unloading device and could be manually unloaded.



Activation of stop lines: allow you to activate a stop line. Each key is associated.

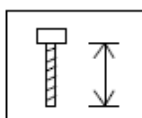
with two stop lines:

- 1st; activates the first stop line (LED on).
- 2nd; activates the second stop line (LED on).
- 3rd; activates the third stop line (LED on).



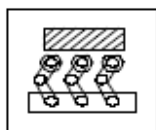
Enabling clamp stops: used to enable the clamp stops locking function when running the program. This control also makes it possible to select whether or not this function is to be enabled alongside the suction cup locking function.

- On = function activated together with suction cup locking.
- Flashing = function activated without suction cup locking.



Pre-setter management: allows the management of the digital Pre-setter device.

- On = Pre-setter management functions activated.



Activation of piece movement devices: used to activate any devices that facilitate the movement of the piece during loading/unloading phases (bar supports, electric fan, etc.).

- ON = function enabled



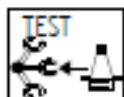
Open tool magazine: allows you to open any covers of the tool magazines.

- ON = function enabled

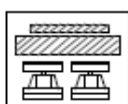


Reset electrospindle: used to lift the electrospindle that has remained down due to a sudden machine stoppage.

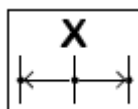
- Flashing = indicates that the electrospindle has to be reset.



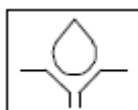
TEST: used to start a test cycle from the position of the tools in the magazine.



Support panel; to visualise, on the software interface of the machine, the data field to modify the thickness of the support panel.



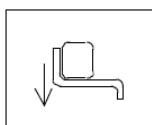
Parking mode; used to manage the operating section parking mode.



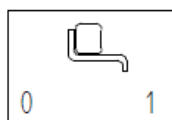
Lubrication cycle: carries out a lubrication cycle on certain devices that allow movement of the main machine axes carriages (slide blocks, lead nuts, racks, etc.).



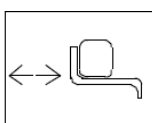
Hold; allows you to stop the machine at the end of the machining operations and to unload all the labelled pieces.



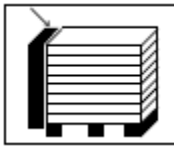
Unloader movement; allows the unloader to be raised or lowered.



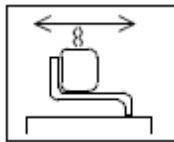
Unloader enabling; used to enable the unloader to load or unload the piece.



Piece unloading: allows to manually unload the machined piece, only if this function has been enabled through the selector "Unloader enabling".



Pushing TEST cycles and panel pick-up; used to enable, in manual mode, piece pushing cycles on the loading pallet or piece pick-up from the loader/unloader.



Cleaning the spoilboard with the loader/unloader; used to run a cleaning cycle of the spoilboard with the loader/unloader.

On = it is possible to launch a cleaning cycle.

Flashing = cleaning cycle in progress.



Boring units heating; used to bring both the boring and milling units up to temperature.



LED pointer; to detect the position of the shapeable suction cups together with the origin of the panel being machined.

- *Off* = LED pointer disabled.
- *On* = LED pointer enabled to detect both the shapeable suction cups and the origin of the panel to be machined.
- *Long flashing* = LED pointer enabled to detect the shapeable suction cups.
- *Short flashing* = LED pointer enabled to detect the origin of the panel to be machined.



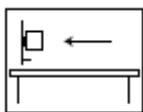
Roller presser: to park the roller presser



Label printer settings; sets labelling machine data at software level (see the User interface manual). Kept pressed for a few seconds it allows to reset the programmed maintenance timer.

The dialogue "labelling machine settings" allows to set the parameters of the labelling machine".





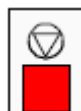
Loading pallet movement; it allows to move the loading pallet axes to move them out of the collision area.



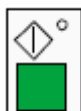
- Jog+: commands the movement of the machine axes in the positive direction.
- Jog Fast: allows you to increase the speed of the axes during the movement in manual mode.



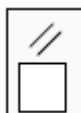
Jog- : commands the movement of the machine axes in the negative direction.



Stop: allows you to interrupt an operation.



Start: allows you to run an operation.



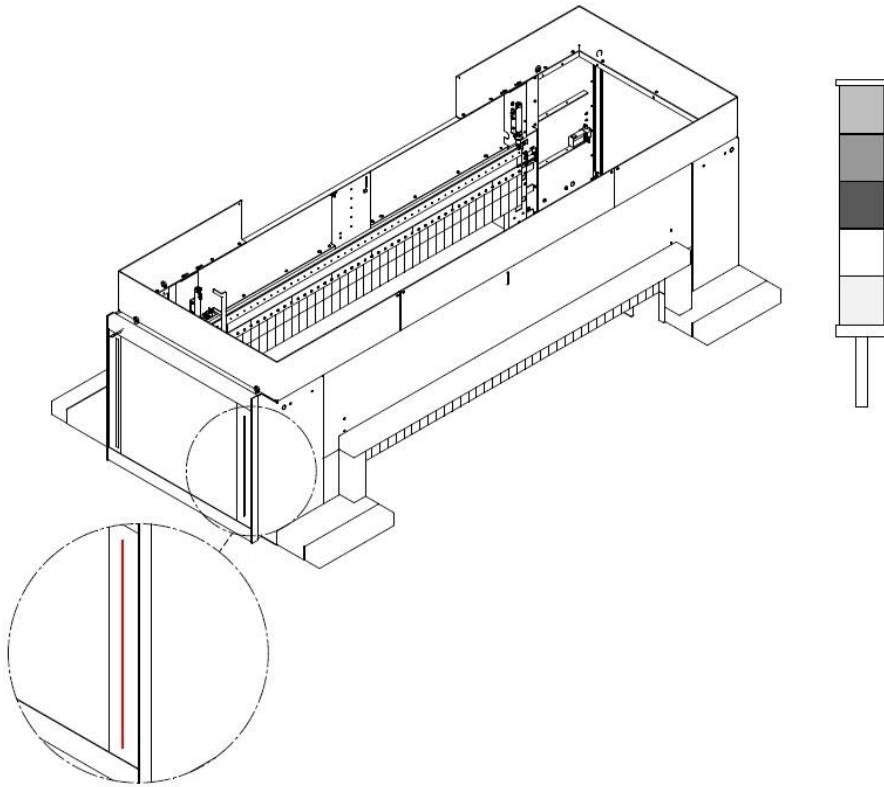
Reset: restores the numerical control after an emergency.



Clear; updates the list of errors displayed in the specific window of the machine software.

5.3. Indicator lamp

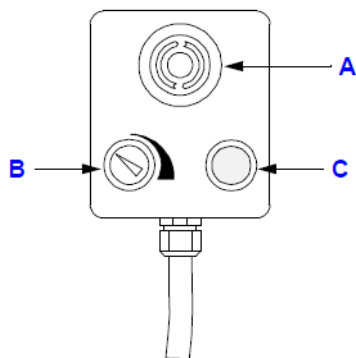
Visual signalling device that indicates the machine status.



1. **Red light**; machine in emergency.
2. **Yellow light**; indicates faults or errors.
3. **Blue light**; indicates operator intervention.
4. **Green lamp** (fixed light); machine powered.
(Flashing light); machine ON.
5. **White LED**; (fixed light) the machine is in program start.
(flashing light); indicates that the machine is in program start mode at reduced speed.

5.4. Machine axis control button pad

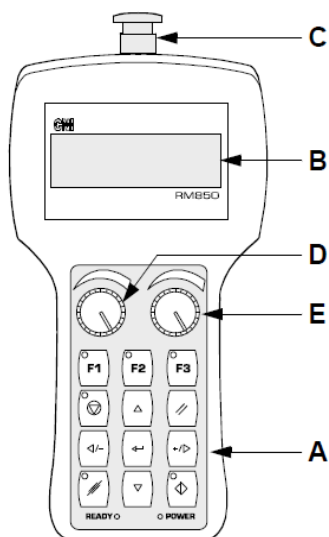
The machine axis control button pad is used to control the speed of advance of the machine axes.



- A **Emergency button**; for description see [paragraph 7.1](#).
- B **Remote override (axes)**; varies the speed of movement of the machine axes.
- C **Multifunction (blue button)**: the function of this button depends on the type of operation being carried out:
 - If machine tooling mode is active, pressing the button will command opening of the electrospindle locking collet, unlocking the tool, whereas releasing the button will close the collet, locking the tool.

5.5. Hand-held terminal RM850

Used to manage various functions from any part of the machine.



A Keyboard

B Display: displays certain terminal functions.

C Emergency button:

D Remote override (axes): changes the speed at which the machine axes move.

E Remote override (spindles): changes the speed at which the working unit spindles rotate.

Keyboard of the hand-held terminal



Table tooling: displays the menu "Table tooling". The LED on the key indicates the state of the left working area:

Off = area free; if the contact mats in the left area are triggered, the machining operation will continue in a normal manner.

Flashing = area occupied; if the contact mats in the left area are triggered, the machining operation will be suspended.

On = area busy; if the contact mats in the left area are triggered, an emergency stop will be triggered in the machine.



Gen functions: displays the menu "Gen functions". The LED on the key indicates the state of the right working area:

Off = area free; if the contact mats in the right area are triggered, the machining operation will continue in a normal manner.

Flashing = area occupied; if the contact mats in the right area are triggered, the machining operation will be suspended.

On = area busy; if the contact mats in the right area are triggered, an emergency stop will be triggered in the machine.



Restore units: moves the working units to the parked position.



Stop: stops an operation.



Up arrow: selects the previous row.



Reset: restores the numerical control after an emergency.



Left arrow: decreases a value and commands movement of the machine axes in the negative direction.



Enter: visualises the list of commands in the menu and activates a function.



Right arrow: increases a value and commands movement of the machine axes in the positive direction.



Esc/Clear: press and release the button quickly to go back one level in the command menu; hold the button down to update the list of errors displayed in the special numerical control software window. A flashing LED indicates that a new error has occurred.



Down arrow: selects the next row.



Start: used to start the machining program and indicates that the machine is working (LED on) or that it is awaiting the start machining command (flashing LED).

Commands menu of the hand held terminal

Environment: used to activate different machine operating modes.

Reset: enables automatic resetting of the machine axes.

Manual Mov: Enables manual movement mode of the machine axes.

Pos. Mov.: enables positioned movement mode (movement to the position indicated) of the machine axes.

Automatic: enables running of machining programs.

Axes: used to select the machine axis to be moved.

T/TH spindles: used to raise or lower the boring unit spindles. This function can only be used if machine axis manual movement mode is activated (see the “Environment” menu).

Select T: displays the vertical spindles, allowing them to be selected using the “Arrow” keys and raised or lowered using “Enter”.

Select TH: displays the horizontal spindles, allowing them to be selected using the “Arrow” keys and raised or lowered using “Enter”.

TP spindles: used to send commands relating to the selected working unit:

Down: lower working unit. Works only if machine axis manual movement mode (see the “Environment” menu) and machine tooling mode (see the “Tooling” selector) are activated.

Resting: lift working unit. Works only if machine axis manual movement mode (see the “Environment” menu) and machine tooling mode (see the “Tooling” selector) are activated.

Unlock Tool: unlocks the tool from the working unit. Works only if machine axis manual movement mode (see the “Environment” menu) and machine tooling mode (see the “Tooling” selector) are activated.

Lock Tool: locks the tool on the working unit. Works only if machine axis manual movement mode (see the “Environment” menu) and machine tooling mode (see the “Tooling” selector) are activated.

Hood step: movement of the suction hood to the set position (Step). The position is set using the “Up arrow” and “Down arrow” keys after selecting the command. Works only if the machine is turned on (“Machine power” button) and if machine tooling mode is activated (see the “Tooling” selector). During the machining operation, the position (Step) of the suction casing cannot be lower than that set automatically by the machine.

Unload tool: starts a tool unloading cycle.

Load tool: starts a cycle loading the tool from the magazine. The tool to be loaded (Pocket) is set using the keys “Up arrow” and “Down arrow” after selecting the command. If the machine has more than one magazine, it is first necessary to select the magazine required. Works only if the machine is turned on (“Machine power” button).

Table tooling: used to visualise information on positioning and characteristics of the various mobile elements on the work table:

TABLE: used to select a mobile piece support and visualise the following information regarding the selected element:

- **X:** position in the X direction.
- **JIG:** used to select a carriage and display the following information regarding the selected element:
- **Y:** position in the Y direction.
- **ANG:** angle of the shapeable suction cup;
- **N:** type of shapeable suction cup.
- **STOP:** used to select a line of stops and display the following information regarding the selected element:
- **Y:** position in the Y direction.

Debug I/O: used to control the state of the machine inputs/outputs, so as to solve any problems.

Movement's mode: used to enable certain functions available in the Positions application software options (see the [Software User Manual](#)).

Gen functions: contains various functions:

Stops row 1: enables the first line of stops.

Stops row 2: enables the second line of stops.

Stops row 3: enables the third line of stops.

Clamps: enables the clamp stops locking function when running the program.

Chip contact mat: starts or stops the chip removal conveyor.

Unloaders: activates or deactivates any devices that facilitate movement of the piece during loading/unloading phases (bar supports, electric fan, etc.).

Mag. Covers: opens or closes the tool magazine cover.

Lubrication: starts a lubrication cycle on certain devices that allow movement of the main machine axes carriages (slide blocks, lead nuts, racks, etc.).

Rem. extrus: command deactivated.

5.6. bPad Terminal

Used to manage various functions from any part of the machine.

The command and signalling elements of the terminal (buttons, knobs, LEDs, etc.) are listed below.



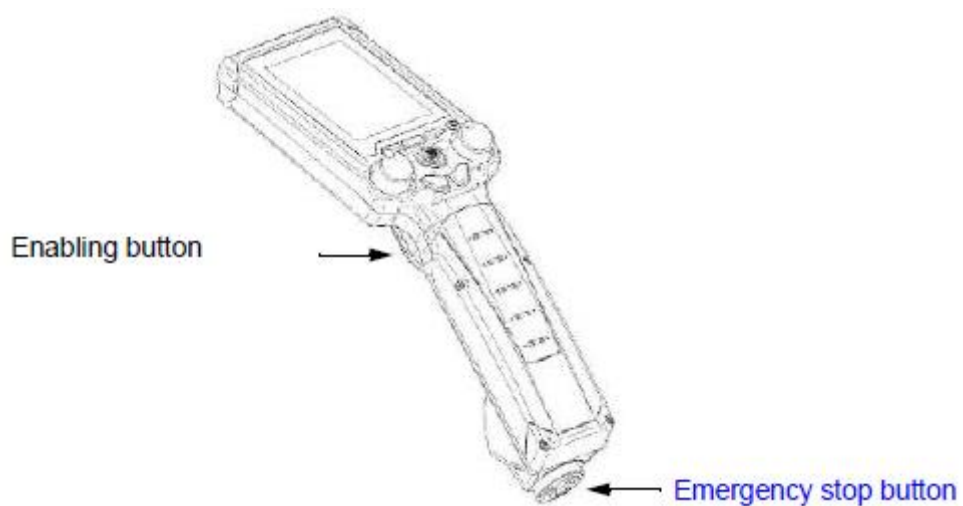
- P1:** STOP button
- P2:** RESET button
- P3:** quick selection button for accessing one of the menu functions or one of the SoftConsole functions
- P4:** BACK button
snapshot button
- P5:** If the camera is active, a photo is taken when the button is pressed.
If the bar code reader is active, the bar code is acquired when the button is pressed.
ON/OFF button
- P6:** With the terminal OFF, press for about 1 second to switch it ON; with the terminal ON, press for about 5 seconds to switch it OFF.
- J1:** Used to move the selection in the four directions of the screen, and to confirm the selected item (by pressing the button on the joystick).
- K1:** Axis override knob
- K2:** Spindle override knob
- L1:** indicator LED showing that the terminal is powered
- L2:** indicator LED showing correct operation between terminal and machine



If this LED is disabled, the machine cannot be powered because the emergency circuit is interrupted.

- L3:** Flashing LED
- S1:** START button

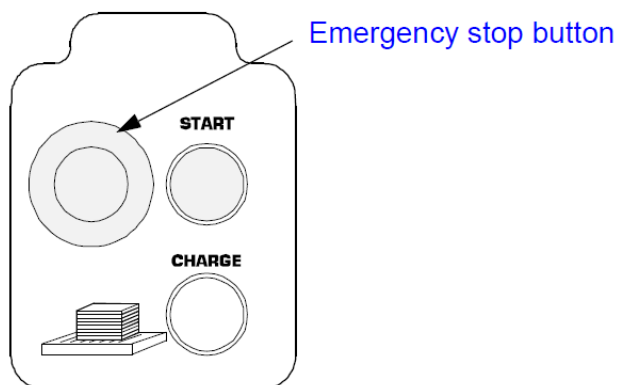
On the lower part of the terminal grip there is an emergency button. The enabling button is on the back.



For the description of the command menu of the bPad terminal, see the **Command menu paragraph**.

5.7. Loading pallet button pad

This button pad manages the loading pallet.



START (green indicator light button): By pressing this button you can reset the photocell barrier. Its light indicates the status of the loading pallet.

- **OFF** = pallet deactivated; use of pallet not allowed.
- **ON (fixed)** = loading pallet activated. In this case, by crossing the photocell barrier, the button switches off, deactivating the pallet.
- **Flashing** = loading pallet activated. In this case, crossing the photocell barrier, the machine stops immediately, and the button switches off, deactivating the loading pallet.

CHARGE (white indicator light button): It commands the loading of the piece stack onto the loading surface of the loading pallet stack.

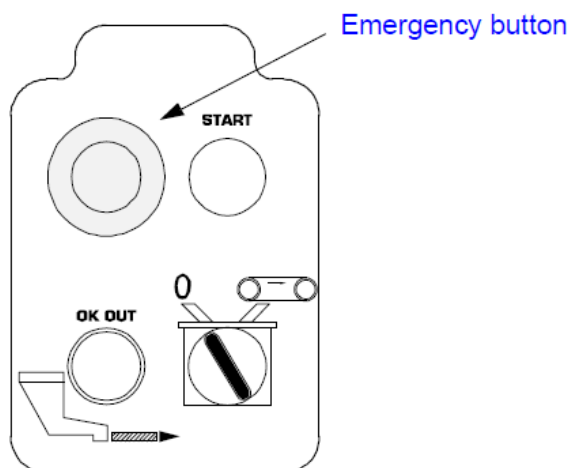
- **Off** = function deactivated.
- **On (fixed)** = function activated. To carry out the loading, press the button; the button begins to flash. Wait for the button to stop flashing, then proceed with the loading.
- **Flashing** = it indicates that the loading surface stack is moving to prepare for loading of the pile of pieces. Loading is only possible when the button stops flashing.

5.8. Unloading belt button pad

This button pad manages the unloading belt.



This button pad will only work if the "unloader enabling" selector is active.



OK OUT (white indicator light button): Used to request the automatic unloading of the worked pieces onto the unloading belt.

- **OFF** = function deactivated.
 - **ON (fixed)** = function activated. Press the button to run the automatic unloading at the end of machining operation. The button pressed starts to flash.
 - **Flashing (slowly)** = indicates that the piece unloading function has been booked. Press this button to disable the booking.
 - **Flashing (fast)** = indicates that an error has been found during the piece unloading booking. Press this button to restore the status.
- When machining is completed the pieces are unloaded automatically onto the unloading belt.

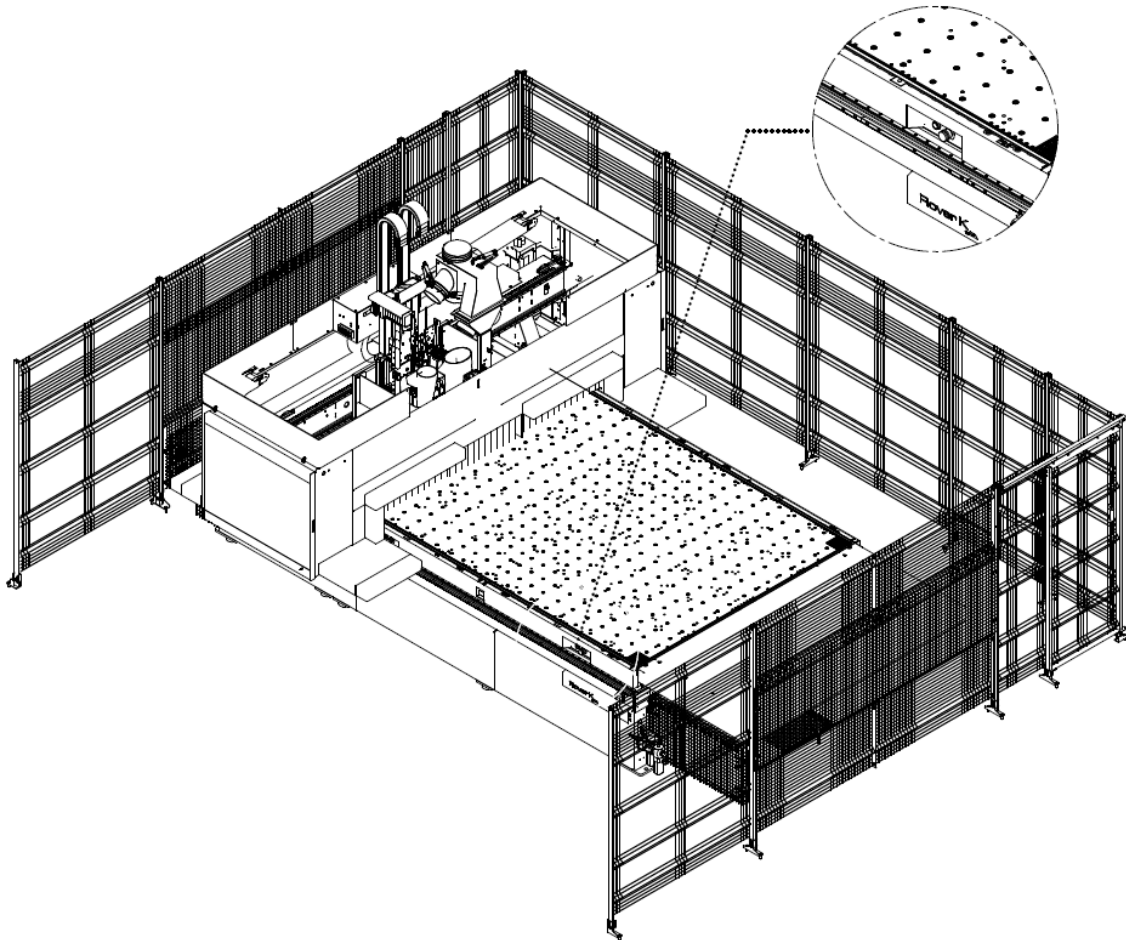
START (green light):

- **ON**: the unloader is not working.
- **Flashing**: the unloader is working.
- **OFF**: the emergency cord must be restored or the machine is in emergency mode.

Belt movement (black selector); to move the belt, turn the selector to the right or press the pedal of the unloading belt.

5.9. Button to reset the photocell barrier

This button resets the photocell barrier.



The different status of the button indicate the following conditions:

Off = photocell barrier has been reset;

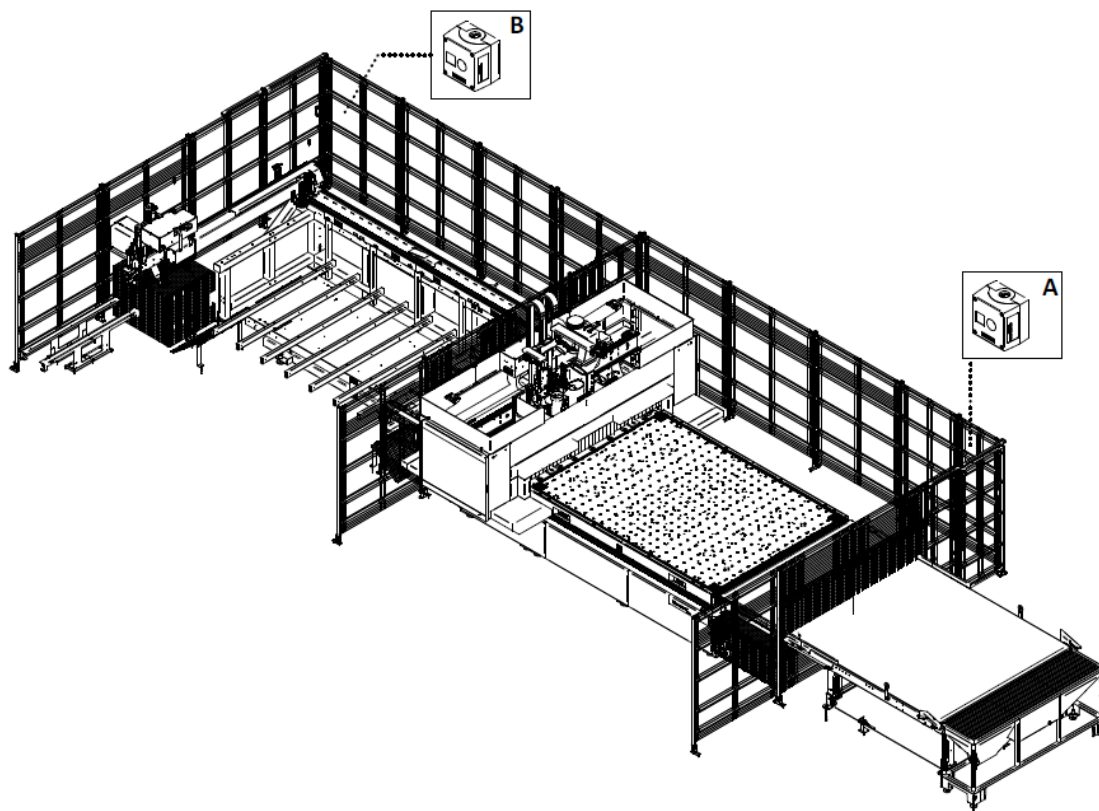
On or flashing = photocell barrier to be reset.

To reset the photocell barrier, proceed as follows:

1. Press the photocell barrier reset button.
2. Exit the photocell barrier.
3. Press one of the “**START (1, 2, 3, 4)**” buttons of the work area button pad or the “Machine Power” light button within a few seconds after it has been pressed.

5.10. Safety fence reset button pad

To restore the safety fence, press the button and power the machine on immediately (see paragraph 5.2). Until the machine is not powered, the safety fence is not restored.



The different status of the button indicate the following conditions:

Off=safety fence has been reset.

On=safety fence to be reset.

Restoring the safety fence of the machine

Once the door of the safety fence has been opened, it must be restored as follows:

- Press the button **A**.
- Close the door.
- Disable the “**Tooling**” selector.
- Press the “**Machine power**” button.

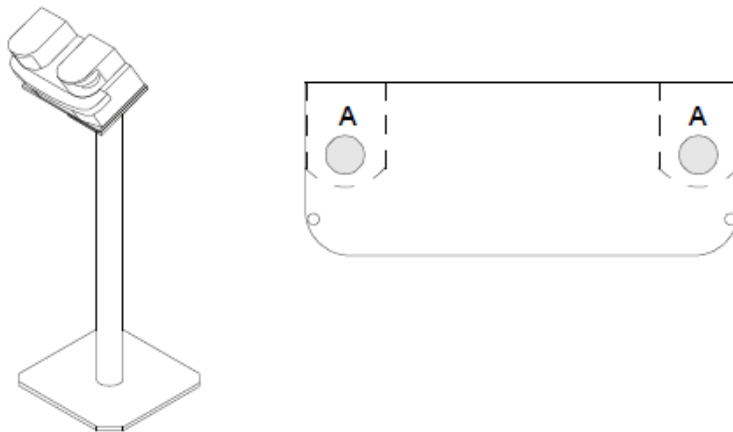
Restoring the safety fence of the loading pallet and of the loader

Once the door of the safety fence has been opened, it must be restored as follows:

- Press the button **B**.
- Close the door.
- Turn the key selector "**Entrance request**".
- Press button "**START**" on the loading pallet button pad.

5.11. Unloading button pad

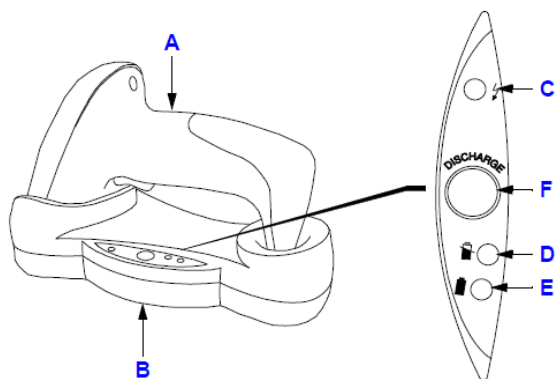
This button pad enables the unloading function of the sweeping arm; the material gets unloaded on any other unloading device than the unloading belt.



- A. Start functions:** Buttons to unload the material using the sweeping arm. The function is activated by pressing both buttons simultaneously and stops when they are released.

5.12. Bar code reader

The bar code reader quickly transmits data to the numerical control in relation to the program to be carried out.



A Reader

B Base

C Yellow LED: indicates that the reader is ready for use (ON) and that data is being transmitted (flashing).

D Red LED: indicates that the batteries are recharging.

E Green LED: Indicates that the batteries have finished recharging.

F Reset batteries key: used to reset the battery duration.

6. Operation and use

This chapter explains the procedures for using the machine: starting up, stopping, switching off, etc.

The manufacturer strongly advises you not to carry out any type of operation on the Machine-integrated PC that is not foreseen by and specified in the User Manual. For example:



- Do not change the system configuration.
- Do not update the system.
- Do not install antivirus, firewall, or other software.
- Do not install unforeseen USB peripheral devices, with the exception of USB flash memories or floppy disk drives.

The manufacturer cannot be considered responsible for any malfunctions resulting from failure to comply with the above warnings.

6.1. Switching on the machine

1. Rotate the main switch of the machine to the “1-on” position.
2. Disconnect the cutout valve.
3. Start the chip suction system to which the machine is connected, making sure that the connection pipe knife valve is open.
4. Check the software interface of the numerical control for possible error messages. To remedy the errors, refer to the Software User Manual and the relevant annexes for the error code, read the description of the fault, and carry out the corrective action indicated.
5. Check that the following safety devices are working correctly.
6. Press the button “Machine power”. The button must light up.
7. Activate the “Reset” icon.
8. Activate the “Clear” icon.
9. Perform a global zero-setting of the machine axes.
10. Carry out the warm-up cycles for the units on the operating section. Once the warm-up cycles have been completed, the machine is ready for use.
11. Check the doors in the safety fence are closed.

6.2. Zero-setting the machine axes

Zero-setting is a procedure via which the machine axes move to a pre-set position known to the NC. Axes reset may be “global”, when all the axes are zero set together, or “single” when the axes are zero set one at a time on different occasions.

Global reset

To carry out a zero-setting of all the machine axes, follow the instructions given below:

1. On the software interface of the NC, activate the global zero-setting mode for the machine axes.
2. Activate the “[Start](#)” icon to start the reset procedure. The first axes to be zero-set are the Z- axes of the working units, followed by the remaining axes.

Single reset

To carry out the zero-setting of a single machine axis, follow the instructions given below:

1. On the software interface, enable single machine axes zero-set mode and select the axis you wish to zero-set.
2. Check that nothing can impede the regular movement of the axes, then command the start of the reset by activating the “[Start](#)” icon.



The single reset must follow the order given above for the global reset.

6.3. Moving the machine axes

On certain occasions (for example during tooling) it may be necessary to move the machine axes manually. To move the machine axes manually, use the numerical control (see the **interface user Manual**).

6.4. Operating section warm-up cycles

When starting up the machine for the first time each day, it is necessary that the units in the operating section perform a short warm-up cycle, proceeding as indicated below.

Milling unit warm-up

Each electrospindle must be made to perform a short warm-up cycle to allow the bearings to reach an even working temperature gradually.

For this purpose, it is necessary to create a program in which each electrospindle is used as follows:

- 50% of max. rated speed for 2 minutes
- 75% of max. rated speed for 2 minutes
- 100% of max. rated speed for 1 minute



To avoid damaging the locking collet, do not run electrospindles with HSK F63 type couplings without first installing a collet spindle.



It is recommended that this cycle be repeated every time the machine remains unused for a period of time sufficient to allow the electrospindle to return to room temperature.

Warming up the boring unit

To obtain precise machining operations, it is very important to make the boring unit carry out a warm-up cycle for about 15 minutes. Since there is no switch-on command as such, follow the instructions given below.

- Create a simple program in which the boring and milling units are used, and run it.
- When the boring and milling unit motors start up, turn the remote override to the left (until it reaches zero) and wait for the length of time indicated above.

6.5. Checking the electrospindle temperature

The electrospindle is fitted with sensors that check its temperature in certain parts (stator and bearings) while it is being used.

Pre-alarm and alarm temperature thresholds are envisaged, and must therefore be taken into consideration.

The pre-alarm threshold signals excessive heating of the electrospindle, and thus a malfunction that must be kept under control and dealt with as quickly as possible. Once the pre-alarm threshold has been exceeded, an error message appears on the PC.

The alarm threshold signals serious electrospindle malfunctioning. Once the alarm threshold has been exceeded, the machining operation stops immediately.

Part checked	Pre-alarm °C	Alarm °C
Stator	100	125
Bearings	60	65

6.6. Machine stop

The machine stops (it stops working) if the electrical power supply is interrupted (see paragraph [“Stop due to interruption of the electricity supply”](#)) or following the deliberate or accidental use of one of the safety devices: emergency cord or button (see paragraph [“Emergency stop”](#)).



If the machine stops, or the machining operation suddenly stops, always check the tools are not moving before going near the operating section.



If the machine or the machining operation suddenly stops, always activate the compressed air cut-out valve before going near the operating section.

Emergency stop

The “emergency” stop is used when it is necessary to stop operation of the machine immediately due to a dangerous situation or unforeseen circumstances.

To perform this type of stop, press the closest emergency button (see [paragraph 7.1](#)). The program being run will stop immediately and the machine will be stopped.

To restore the machine to normal operation, proceed as described in [paragraph 6.7](#).



When the function that prevents tool rotation is deactivated (see the [“Deactivation of tool rotation”](#) in paragraph [“Soft console”](#)) the working units lift up, even in the event of an emergency stop. Before disabling this function, perform a machine reset if necessary (see [paragraph 6.7](#)).

Stop due to interruption of the electrical supply

If there is an electricity failure, the machine will switch off.

Machine without UPS

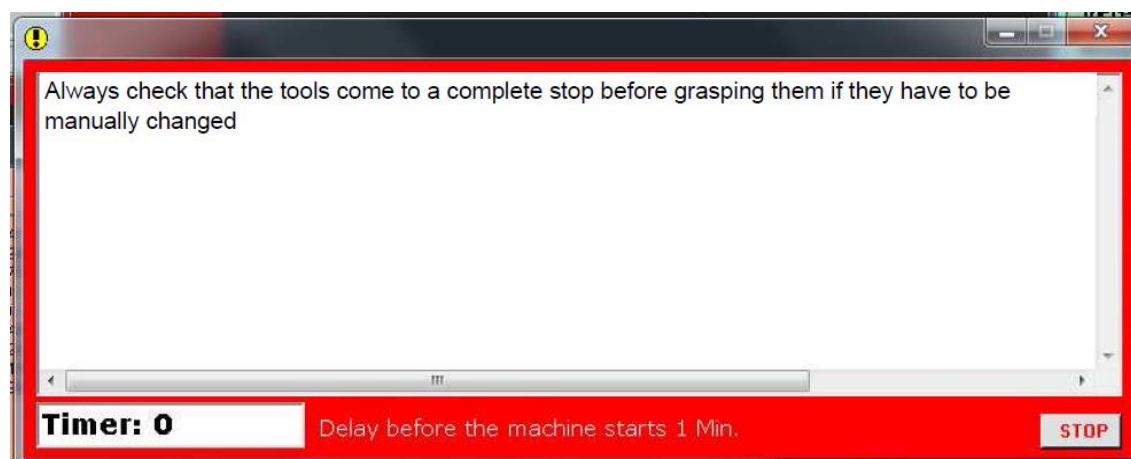
- Turn the main switch to 0-OFF, and padlock it.

Machine with UPS

- Do not switch the computer off manually, wait for it to switch off automatically.
- The UPS signals the power failure and begins the countdown.
- Wait 4 minutes, until the UPS switches off.
- Turn the main switch to 0-OFF and padlock it.



Keep away from the working units when this message is displayed on the PC as their rotation is no longer under control.



6.7. Restoring the machine

If there is a sudden stop of the machine functions to reset them, you must proceed as indicated below.



Before moving the machine axes, the tool magazines and the electrospindles, remove any obstructions to ensure that there is no risk of danger.

Resetting in the event of an emergency stop

1. Eliminate the cause of the sudden machine stoppage, resetting any commands or safety devices activated.
2. Press the “Machine power” stop button.
3. Activate the “Stop” icon.
4. Activate the “Reset” icon. In certain cases, if stoppage has occurred during automatic tool change operations, it may be necessary to run a reset cycle for the operating section and magazine involved.
5. Check the condition of the red LED relating to the key “Reset electrospindle” command. If the LED is flashing, this means the electrospindle must be reset; in this case, check there are no obstacles to its movement then activate the “Reset electrospindle” icon.
6. Restart the machining operation.

Resetting after an electricity failure

1. Rotate the main switch of the machine to the “0 off” position and, when the electricity supply has been restored, repeat the machine switch-on procedure.
2. Lift the piece from the work table if the electricity supply interruption happened when the program was running.
3. Carry out the machining operation procedure again (see paragraph 8.4 or 8.6).

6.8. Interrupting the program

This type of stop is used when it is necessary to stop the program being run without stopping the machine altogether (the spindles continue to turn).

- To temporarily suspend the machining operation, press the “**Stop**” key. By activating the “**Start**” icon once again, you can continue the machining operation from the point at which it was interrupted.
- To stop the machining operation completely, activate the “**Stop**” icon and the “**Reset**” icon. In this case, it is not possible to continue the machining operation from the point at which it was interrupted.

6.9. Stopping the program with the loading/unloading unit in use

If the program gets interrupted (with the loading/unloading unit in use), the machine must be manually restored when: the piece is not completely out of the loading pallet or it has not been completely loaded into the machine by the loader/unloader.

To restore the machine, follow the procedure below:

1. Lower the loading table of the loading pallet.
2. Move the working unit away.
3. Manually push the piece.
4. Reset the machine power

6.10. Restarting the program after an emergency stop

If the piece blocks after the emergency stop, it is necessary to reset the machine functions (see paragraph 6.10) and restart the machining program execution.

If the function to prevent the piece unlocking is activated (see the “**Piece release prevention**” icon on “paragraph **soft console**”) or the clamps have been used, the piece being worked remains blocked; in this case observe the procedures indicated in the paragraphs below.

Resuming the machining operation from the start

This operation is carried out when the piece release prevention function (icon “Piece release prevention” enabled) has been activated.

1. Restore the working of the machine.
2. Activate the “Start” icon to run the machining program.
3. Press the flashing button “START (1, 2, 3, 4)”, the operating section moves to its resting position.
4. Press the button “START (1, 2, 3, 4)” again; the machining operation restarts from the beginning.

Resuming the machining operation from the point at which it was interrupted

This operation is carried out when the piece release prevention function (“Piece release prevention” icon enabled) has been activated, or in the case of locking with clamps (“Clamp activation” icon enabled).

1. Press the button “Machine power”.
2. Press the flashing button “START (1, 2, 3, 4)”, the machining operation resumes from the point at which it was interrupted.

6.11. Switching off the machine

- Move the operating section into the parking area on the left hand side, to prevent any tools that may be fitted on the units from coming into impact with the elements of the work table.
- Remove the tools from the electrospindles and protect the coupling area from dust and/or impurities by applying a plug or a clean collet spindle.
- Stop the machine at the end of its working cycle by pressing the “Machine power stop” button.

Machine with UPS

- The PC must not be switched off manually; the operation is automatically commanded by the UPS.
- Turn the main machine switch to 0 (OFF) and padlock it if necessary.
- Wait for the PC to switch off completely.
- Wait another 4 minutes, until the UPS switches off.

Machine without UPS

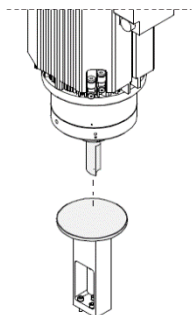
- Carry out the switch-off sequence of the PC clicking on Start - Close session - Stop the system.
- Wait for the PC to switch off.
- Turn the main machine switch to 0 (OFF) and padlock it if necessary.
- Close the compressed air system by means of the cut-out valve (see **paragraph 7.7**).



One of the pistons moving the electrospindle vertically remains under pressure, even when the cutout valve has been triggered. To avoid a sudden descent of the electrospindle, do not tamper with the respective pneumatic pipes.

6.12. Using the Presetter device

The digital Presetter device allows you to measure the length of the tool in the electrospindle (measuring precision ± 0.025 mm), and to register it in the tool table of the NC.



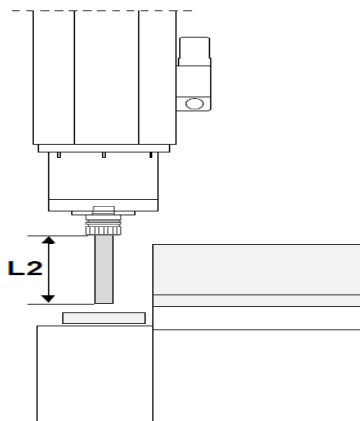
To carry out this operation, observe the following procedure:

1. Check that the machine has been set to receive electrical energy ("Machine power" and "Stop-Reset").
2. In the numerical control software, activate the environment AUTOMATIC (see the [Interface user manual](#)).
3. Activate the "Pre-setter management" icon; a new dialogue box will be displayed in the numerical control software.
4. In the appropriate fields, choose the option relating to tool measurement (see the [Interface user manual](#)).

To avoid the operating section jolting against the worktable, the use of this device is only allowed when the data of table are respected.

L2 min = minimum tool length.

Type of collet spindle		L2 Min
Connection device	Collet	
ISO 30	ERC 32	55
ISO 30	ERC 40	45
HSK F63	ERC 40	30

Type of collet spindle		L2Min
Connection device	Collet	
		

6.13. Using the RM850 hand-held terminal

The hand-held terminal RM850 (see paragraph 5.5) can be used to manage various functions from any part of the machine.

These functions can be used especially during tooling or to perform operations reserved to qualified personnel authorized by the manufacturer.



To activate a function on the hand-held terminal, use the command menu provided and/or the corresponding key on the keyboard (see paragraph 5.5).

An area has been provided on the mobile panel support in which it is possible to fix the hand-held terminal using the magnet provided, to facilitate use of the hand-held terminal during tooling of the work table.



Before activating a function using the hand-held terminal, move a safe distance away from any parts to be moved.

Activating a function using the command menu

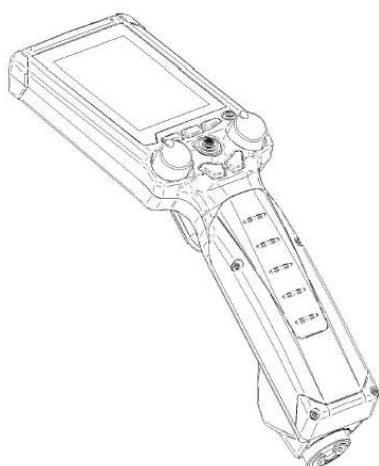
1. Use the “Up arrow”, “Down arrow” and “Enter” keys to visualise and select the commands. A full list of commands is given (see **paragraph 5.5**). The symbol “>” indicates the current selection. To return to the main menu, press “Esc/Clear”.
2. Press “Enter” to activate the function associated with the chosen command.

6.14. Using the bPad terminal

The bPad terminal (see paragraph 5.6) is used to manage a variety of functions from any point on the machine. These functions can be used during the tooling phases or to carry out interventions reserved for specialised technicians authorised by the manufacturer.



In the case of several machines with bPad terminals, use the kit of numbered stickers (supplied with the machine) to identify which terminal corresponds to which machine.



When the electrical cabinet is powered, the terminal switches on automatically (but only if it is inserted in the recharging station). To switch on the terminal, insert it in the recharging station or press the **ON** button on the terminal itself.



Before activating a function using the hand-held terminal, move a safe distance away from any parts to be moved.

When the electrical cabinet is deactivated, the terminal switches off automatically after a few minutes.

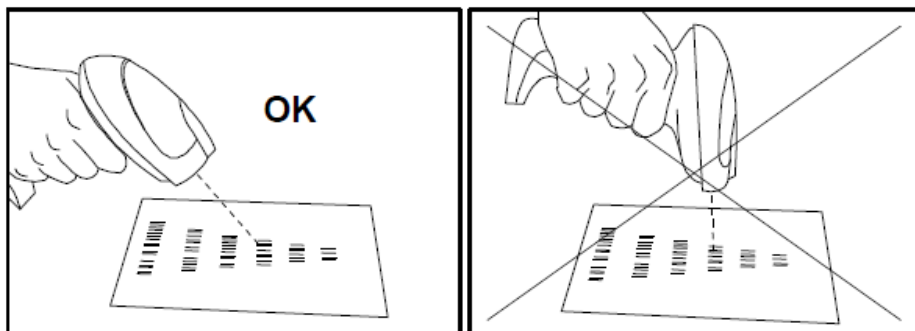
If the terminal is taken far from the electrical cabinet, it will be out of range and will trigger a machine emergency situation. In this situation, the homepage will appear on the screen and the green “L2” LED will switch off.



Switching the terminal off via the relative button triggers a machine emergency.

6.15. Using the bar code reader

Read the bar code with the reader supplied, as shown in the figure below. If the reading is successful, the reader will make a short beep and the green LED on it will light up.

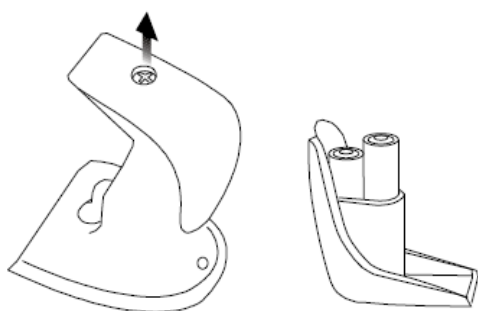


Recharging the batteries

When the reader is placed on its base unit the batteries are recharged, and this is signalled by a red LED. When the batteries are fully recharged, the green LED will light up.

After a number of recharge cycles, the duration of the batteries may decrease. To reset a good battery duration level, place the reader on its base and press the battery reset key (see paragraph [5.12](#)).

Replacing the batteries



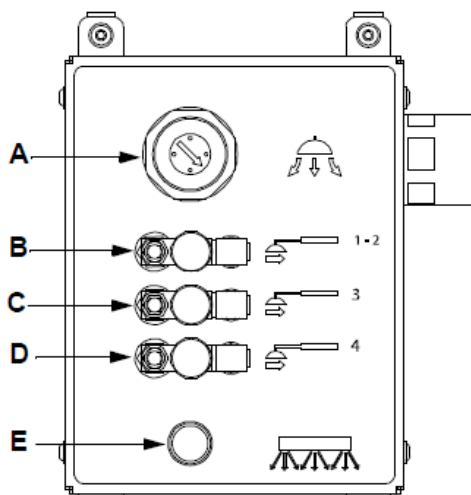
6.16. Detachment device unit adjustment

The detachment device unit requires pneumatic adjustment based on the characteristics of the pieces to be machined.

This contains some of the regulators that were normally located inside the electrical cabinet of the scissor lift. This is fixed to the safety fence, in a position accessible to the operator. In this way it is possible to adjust the necessary parameters to detach the panels easily without having to reach the rear side of the machine.

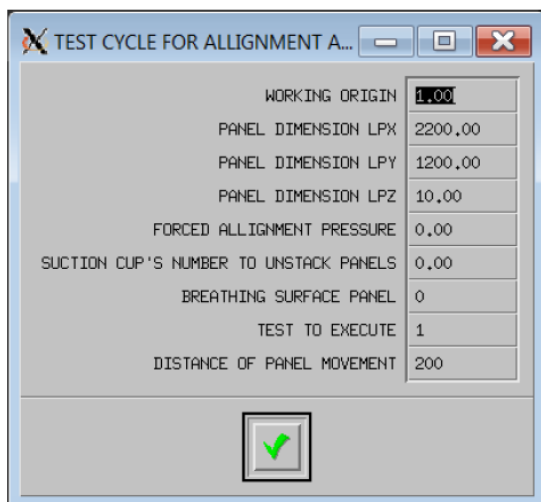
The possible adjustments are:

- Blow of the suction cups of the detachment devices
- Pushing force of the front pushers
- Blower.



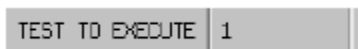
- A** Blow adjustment of the suction cups of the front detachment devices of the loading pallet.
- B** Pushing force adjustment of the front pushers 1 and 2.
- C** Pushing force adjustment of the pusher 3.
- D** Pushing force adjustment of the pusher 4.
- E** Blower adjustment.

To facilitate these adjustments, cycles are provided to simulate the front pushing phase and the panel loading phase.



The parameter in the window (one before the last) launches the cycles related to adjustments.

- Entering 1 launches the front pushing cycle.

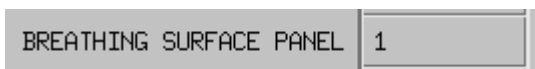


- Entering 2 launches the loading cycle.

Blow adjustment of the suction cups of the detachment devices

To enable this function, you must enter **1** in the parameter **"BREATHING SURFACE PANEL"**.

To adjust the intensity of this blow, use knob **A**.



The higher the breathability of the pieces, the higher the intensity of the blow.

Pushing force adjustment of the front pushers

This adjustment can be enabled in two ways:

- High pressure
- Low pressure

If piece is more than 8 mm thick, “high pressure pushing” will be enabled by default. If piece is equal to or less than 8 mm thick, “low pressure pushing” will be enabled by default.



Low pressure pushing is required when the panels to push are fragile or can be deformed.



If the piece to push is thicker than 8 mm but is fragile, you must force low pressure pushing. To do so, enter -1 in the parameter “**FORCED ALIGNMENT PRESSURE**”.

FORCED ALIGNMENT PRESSURE	-1
---------------------------	----



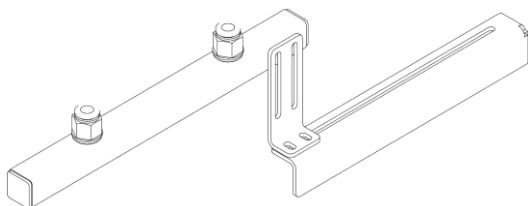
If the piece to push is equal to or less than 8 mm but requires high pressure pushing, enter 1 in the parameter “**FORCED ALIGNMENT PRESSURE**”.

FORCED ALIGNMENT PRESSURE	1
---------------------------	---

Blower blow adjustment

The blower's blow is used to create a layer of air between the first and second panel in order to promote detachment.

To adjust the intensity of this blow, use knob **E**.



This blower's airflow must be as high as possible.

Parameter	Pressure
Compressed air flow inside suction cups	6 bar
Front pushers pushing force	4 bar
Blower blow	open

7. Using the safety devices

This chapter provides important information for the correct use of the safety devices present on the machine.



Should the safety devices fail to operate correctly, inform the maintenance technician or the service centre. Under no circumstances must the machine be used if the safety devices are not working.

7.1. Emergency stop button

The emergency button (red mushroom-head) is used to stop the machine in the event of a potential danger or unexpected event, and it is located at various points on the machine:

- Control panel
- Work Table
- Machine axis control button pad
- Hand-held terminal RM850
- Loading pallet button pad
- Unloading belt button pad
- bPad terminal
- Safety fence



Activating the button does not electrically isolate all the parts of the machine.



To avoid wear in the button mechanisms, only use it for emergency stops. (see paragraph 6.6).

Checking proper operation

1. With the machine switched **ON**, press any one of the available emergency buttons and make sure the **Machine Power** indicator light button is **OFF**.



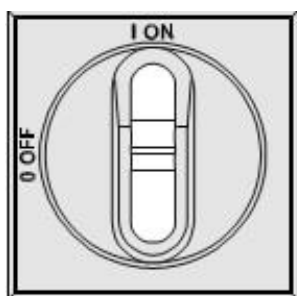
2. To reset the device and restore the machine functions, rotate the button in the direction indicated by the arrows on the button itself.



7.2. Main switch

The main switch isolates the machine from the electricity supply in order to enable maintenance or repair work to be carried out in safety.

Rotating the switch to the “**0-off**” position, interrupts the flow of electricity from the power supply network.



When the switch is in the 0-off position, the terminals to which the power supply cables are attached are still live.



After the switch has been rotated to the 0-off position, the condensers will remain charged and live for a few minutes.



To prevent the machine from being accidentally switched on during maintenance or repair work, padlock the switch in the off position.

7.3. Emergency cord

The emergency cord allows to stop:

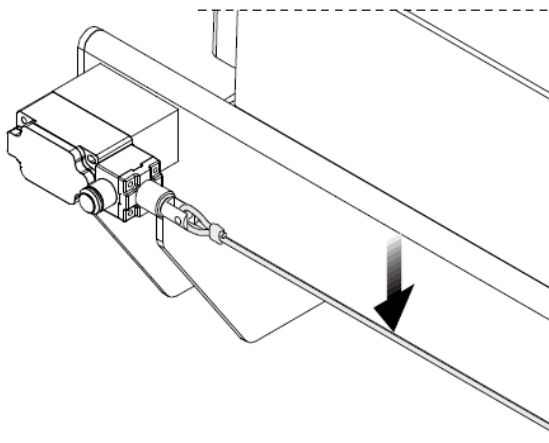
- The unloading belt if the loading/unloading device is not performing any unloading cycle.

To restore the working of the machine, see paragraph [6.7 “Restoring the machine”](#).

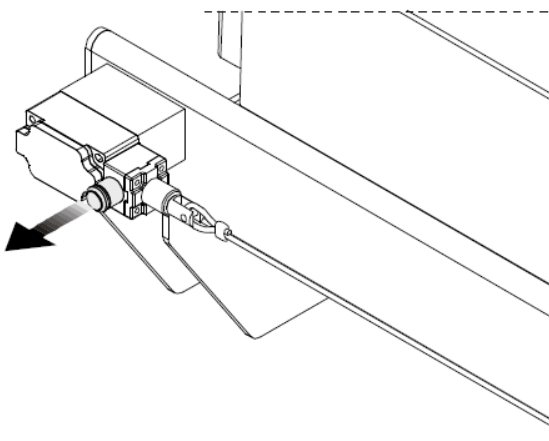
Checking proper operation

Stopping the unloading belt:

1. Set the unloading belt in motion, activate the emergency cord and make sure that the belt stops.



2. To disable the device, pull the knob on the switch which is connected to the cord.



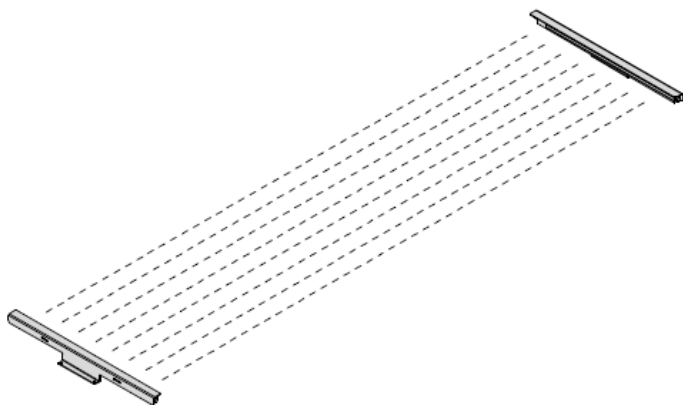
7.4. Busy unloading belt photocell

The photocell, indicating that the unloading belt is busy, allows to stop the automatic unloading operations until all the pieces, on the unloading belt, get removed.

Once all the pieces have been removed, turn selector “[Unloader movement](#)” to reset the photocell.

7.5. Loading pallet photocell barrier

The photocell barrier offers protection against the risk of interference with the moving parts passing through the loading pallet.



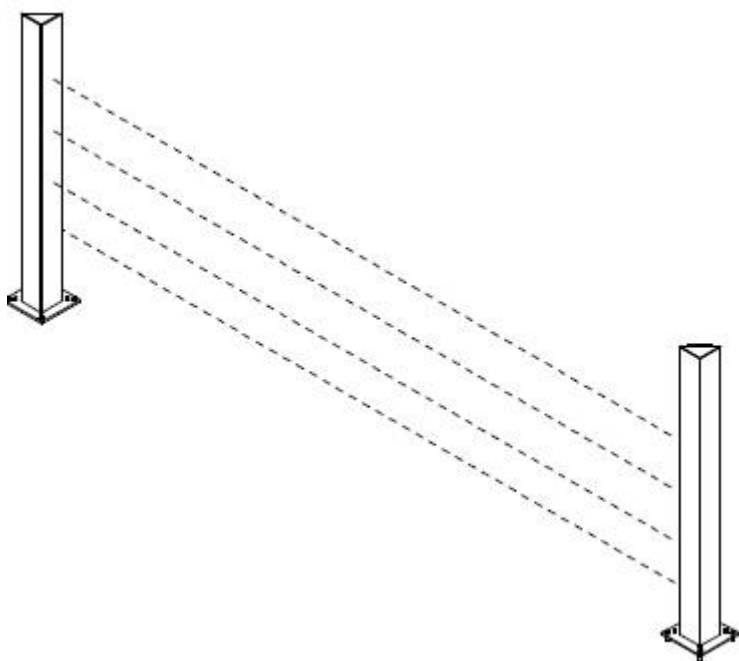
- If one passes through the photocell barrier during the automatic loading operations, the machine stops in emergency status. To restore the working of the machine, see paragraph [6.7](#).
- If one passes through the photocell barrier of the loading pallet when the machine is machining without the loader/unloader (up position), only the loading pallet will be disabled. To restore the photocell barrier, press on “[START](#)” (Loading pallet button pad see paragraph [5.7](#) or on “[Machine Power](#)”, see paragraph [5.2](#)).

Checking proper operation

1. Move the Zs axis (loader/unloader) to its low position.
2. With the photocell barrier interrupted, the machine power button should switch off.
3. Restore machine functioning.

7.6. Photocell barrier

The photocell barrier offers protection against the risk of interference with the moving parts of the machine.



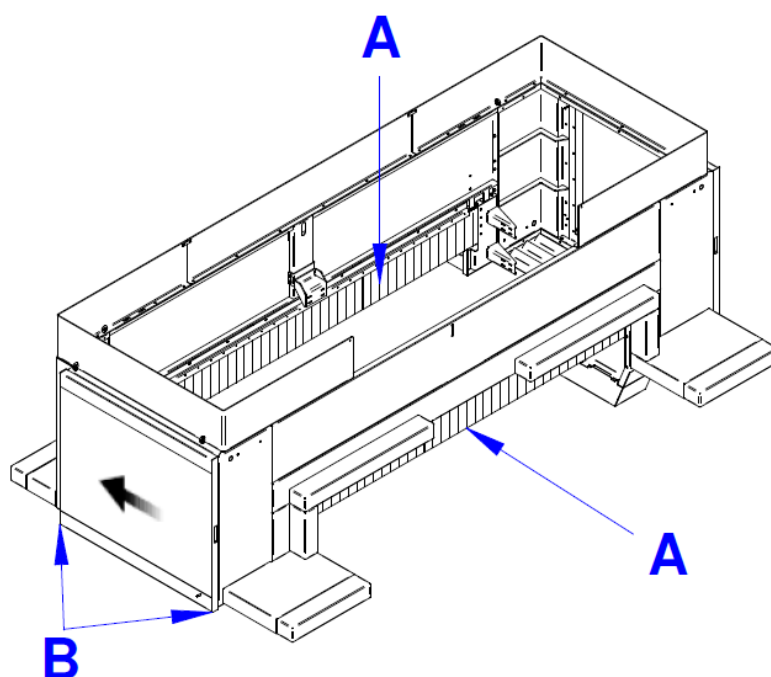
Checking proper operation

1. Using the hand-held terminal, move the working unit while crossing the photocell barrier.
2. The machine must stop.
3. Restore the photocell barrier.

7.7. Operating section guards

The operating section is fitted with a guard that isolates the working units when they are moving, hence avoiding any contact with the external areas, limiting the noise emission and the risk of flying chips or tool parts.

It is fitted with reinforced, transparent panels and curtain guards made of flexible material (**ref. A**). The operating section guard may be fitted with pressure sensors (**B**).



Before starting machining operations, check that the curtain guards are not damaged.



Never insert your hands or other objects into the upper part of the operating section guard panels.

The front part of the protection has a sliding panel to access the operating section during tooling and in case of maintenance or repair. The sliding panel is released by pulling the handle. The release of the sliding panel can only occur after having enabled the tooling mode by means of the appropriate command.

7.8. Safety fence

The safety fence prevents access to the danger zones while the machine is in operation.



Never insert your hands or other objects into the upper part of the operating section guard panels.

The safety fence is also equipped with doors to allow access for interventions on the machine. When the doors are opened, the machine stops immediately.



To prevent anyone from accidentally restarting the machine when entering the area protected by the safety fence, remove the key from the limit switch lock and keep it.

Checking proper operation

1. Turn the “[Tooling](#)” selector to unlock the doors.
2. Open the safety fence door.
3. Turn the “[Tooling](#)” selector to enable the machine power.
4. Press the machine power button and check that is **OFF**.
5. To allow the machine to be restarted, press the button on the “[Safety fence reset button pad](#)”, close the door and power the machine on.

Entering the safety fence of the machine with loader

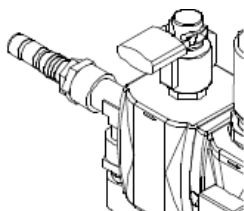


The operator may only carry out extraordinary maintenance operations.

1. Turn the “[Entrance request](#)” selector.
2. Wait for the indicator light “[Entrance enabling](#)” to be **ON**. The loader is in emergency.
3. Enter the work area of the loading pallet and the loader.
4. Before exiting, press the button on the safety fence restoring button pad.
5. Close the door.
6. Turn selector “[Entrance request](#)”.
7. Press button “[START](#)” on the loading pallet button pad.

7.9. Compressed air cut-out valve

The cut-out valve in the FR unit allows the compressed air system of the machine to be isolated in order to enable maintenance and/or repair work to be carried out safely. When the cut-out valve is activated, the air present in the machine system is discharged and the flow of air from the external supply network is shut off.



When the cut-out valve is activated, some of the units might drop down due to gravity. You should therefore stand well away from the moving parts of the machine.



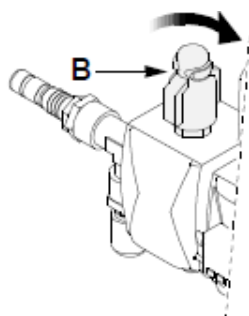
Some parts of the machine may still be under pressure even after the cut-out valve has been activated. If necessary, fix all parts that may be subject to the force of gravity.



To prevent the compressed air from being accidentally turned on during maintenance or repair work, padlock the cut-out valve.

Checking proper operation

1. Press the machine power button.
2. Press the emergency button.
3. Open the cut-out valve B.
4. Check that the pressure gauge indicates a pressure of 0 (zero) bar.
5. Press the Machine Power button and check that:
 - The machine remains in a state of emergency stop.
 - The corresponding error message is displayed on the screen.
6. To disconnect the device, and to allow the machine functions reset, close the valve B.



Check the pressure in the vacuum system

1. Press the machine power button.
2. Bring the machine to the emergency stop condition.
3. Make sure that there is no residual vacuum in the shapeable suction cups (press the vacuum valve on the shapeable suction cup and check that no air comes out).
4. Unfasten the connector that connects the electrical cabinet to the vacuum pump.
5. Quit emergency stop mode by powering up the machine and pressing the Reset button on the NC keyboard.
6. Select a program and press Start.
7. Carry out the locking procedure.
 - Select the origin.
 - Press the Piece locking pedal.
 - Press START on the working area button pad.
8. Check that:
 - The machine does not move from the parked position reached when the locking origin was selected.
 - The NC is set to STOP.
 - The LED on the NC keyboard START button is flashing, indicating that the machine is in suspended mode.
 - The PC monitor shows the insufficient vacuum message.

7.10. Key-activated commands

Some machine commands can only be activated by inserting a key in the respective lock, in order to prevent from accidentally activating the devices, when operations are carried out inside the danger zones of the machine.

8. Carrying out machining operations

The information concerning the methods and procedures for performing machining operations given below presuppose the preparation and start-up of the machine as well as a thorough knowledge of the software (see the Software User Manual).

8.1. Warnings for correct machining operations

Below there is a list of the warnings to be observed before, during and after the machining operation.

Failure to observe the following indications could cause injury to people or damage to things.

Before the machining operation

- Check that the conical coupling of the collet spindles, as well as the conical and stop surfaces of the electrospindle are thoroughly clean, to ensure safe locking.
- Protect the coupling area of the unused electrospindles from dust by applying a plug or a collet spindle.
- Carry out warm-up cycles on the milling and boring units.
- Protect unused carriages with the special cover, to prevent them from filling with dust, as this would result in excessive blockage of the filter and might cause the piece to fall off.
- Never use tools beyond the speed limit, which is stamped on the surface of the tool or indicated by the manufacturer. Certain tools, if rotated at speeds greater than those intended, could break, projecting splinters.
- The values given in the table refer to the maximum rotation speed to be set for the electrospindle, in relation to the weight and diameter of the tool used.

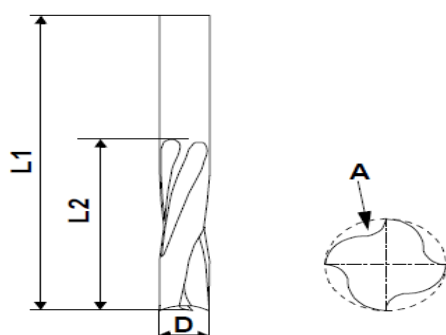
Tool diameter (mm)		Tool weight (kg)		Max. speed (rpm)*	
ISO 30	HSK F63	ISO 30	HSK F63	ISO 30	HSK F63
150	160	4	6	5000÷9000	5000÷9000
130	150	4	6	9000÷12000	9000÷12000
100	110	2.5	5	12000÷14000	12000÷14000
80	80	2.5	4	14000÷18000	14000÷18000
50	50	2	3	18000÷24000	18000÷24000

* The values refer to tools with balance quality G. 2.5, according to ISO 1940 standards.

- Set the correct acceleration and deceleration ramp times according to the diameter and mass of the tools to be used on the electrospindles. These values are expressed in seconds and refer to a speed of **24000 rpm**, even if the tool is unable to reach this speed. The values for the same tool must be the same.
- If incorrect values are entered, the tool may continue to rotate under inertia for several minutes, even after an emergency stop or when the machine is switched off, creating a hazardous situation for anyone coming near the operating section. To check that the data entered are correct, perform a few start and stop cycles of the electrospindle, checking that the tool stops correctly and that the NC has not produced any error messages.
- A few reference values that must always be checked on the machine are shown below:

Tool Diameter (mm)	Tool Weight (Kg)	Maximum speed (rpm)	Ramp time (s)
20	0.4	24000	2
140	3	12000	4
230	6	5000	9

- For Nesting projects on chipboard pieces (only with FT tables), with high speed machining, a 50 m/min tool speed limit must be observed. A good machining operation, with well-defined pieces, is only achieved through the use of appropriate tools, which in turn prevents the electrospindle from being damaged.
- The following list is an example of the characteristics a tool should have in order to carry out this kind of machining operation:
 - Diameter (D): 12 or 14mm.
 - Tool length (L2): 70/80mm.
 - Cutting edge length (L2): 25/30mm.
 - Four cutting edges with wide root grooves (A).
 - Rotation speed: 20000/24000 rpm.



- When the aggregate with copier is used, the aggregate in-and-out speed should not be too high to prevent it from hitting the piece. The speed to be set should not exceed 6/8 m/min.

- When using an aggregate with copier, bear in mind the maximum and minimum depth it can reach:

Device type	Minimum depth (mm)	Maximum depth (mm)
Setting axis	1	10



Failure to comply with the above-mentioned indications may cause irreversible damage to both the electrospindle and the aggregate.



Before performing a machining program, perform a simulation to check that there is no interference during movement of the machine.

During the machining operation

- Avoid, at all costs, any contact between the rotating, non-cutting parts and the piece being machined.
- During the loading and unloading of the piece, operator must never lean on the worktable or climb on to the machine.
- During “Pendulum operation” take in to account the safety limits, set in the numerical control to avoid damaging of the pieces. In this mode the vacuum table of the machine is available in two zones for working with the panel. When the operating section is working in one zone the other zone is available for loading / unloading the pieces. Please refer to the machine working field (**paragraph 15.8**).
- If the axis speed slows down (this is visible in the software interface from the reduction of axis speed - axis override bar), the electrospindle is absorbing too much current. In this case, it is necessary to check that the parameters of the machining operations are correct (speed, etc.) or that the tool is not worn. If necessary, change it.
- When using an aggregate, consider the machining operation suspension times that are necessary in order not to overheat it (see the **Aggregate User Manual**).
- To avoid damaging the locking collet, do not run electrospindles with HSK F63 type couplings without first installing a collet spindle.



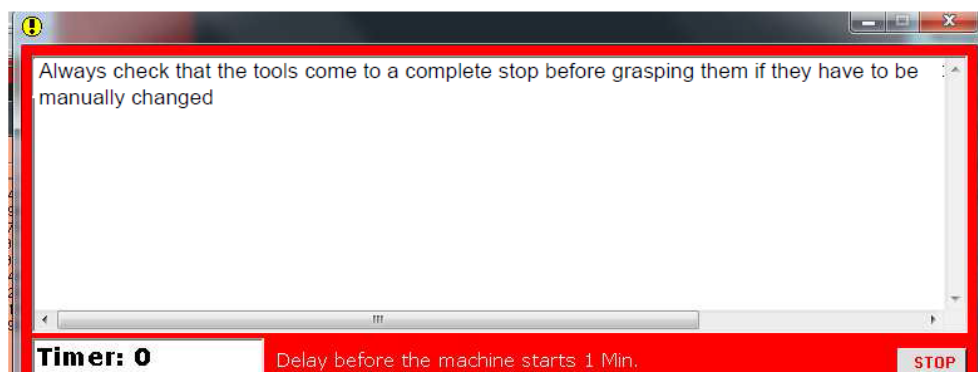
If the machine stops or the machining operation suddenly stops, always check that the tools are not moving before going near the operating section.



During pendulum mode, if the bumper is being activated / comes in contact with the operator during loading or unloading pieces machine will be stopped



Keep away from the working units when this message is displayed on the PC, as their rotation is no longer under control.



After the machining operation

- If the machine remains unused for a long time (e.g. during the night or on non-working days), remove the tools from the electrospindles and replace them with a plug or a clean collet spindle.
- At the end of the machining operation, to avoid problems of sticking, always remove the collet spindle from the electrospindle and replace it with a clean one at room temperature. Warning! Wear gloves to avoid burns.

8.2. Changing the machine axis movement speed

The machine axes transfer speed is usually changed when testing a program, in order to select the speed best suited to the material to be machined, or to allow closer observation of movements in particularly critical points of the program.

The speed is changed manually by turning the remote override knob (see paragraph 5.4) located on the [Machine axis control button pad](#). The percentage variation is visualised in a special data field on the machine software interface.

8.3. Changing the spindle rotation speed

The variation of the rotation speed for the working unit spindles was normally carried out when testing a program, in order to select the most suitable speed for the material being processed. The speed is changed manually by turning the remote override knob (see paragraph 5.4), located on the [Machine axis control button pad](#). The spindle rotation speed can be reduced to a minimum of 50% of the programmed speed. When the spindle rotation speed is reduced, the machine software displays a warning message. The percentage variation is visualised in a special data field on the machine software interface.

8.4. Procedure to carry out the machining operation with the loading/unloading unit

To carry out a machining operation using the loading/unloading unit in its automatic function for transporting the pieces onto the work table and unloading the machined pieces, observe the following procedure:

1. Create a machining program. (see the Interface User Manual).
2. Tool the machine, if necessary (for information, see “Tooling”). If the spoilboard is used, see paragraph 8.14 to modify its dimensions.
3. Rotate the selector “Unloader enabling” to position 1 (see paragraph “Soft console”).
4. Wait for the CHARGE button to light up (loading pallet button pad) if you need to load the stack of pieces on the loading pallet.

To carry out the loading, press the CHARGE button, the button will flash until the stack loading surface movements are completed. Wait for the button to stop flashing, then proceed with depositing the pieces.



In this case, before carrying out this operation, check the axes have been reset, the machine is in MANUAL MOVEMENTS mode (see the Interface User Manual), and there is no operation under way.

5. From the software interface, run the machining program previously created, click on the icon “Start” and fill in the requested data fields, in the interface dialogue window.

PARAMETRO	VALORE
ORIGINE DI LAVORO	1000
SPESSORE PANNELLO MARTIRE	10,70
SPESSORE ULTIMO PEZZO DELLA PILA	19,00
NUMERO PANNELLI DA CARICARE OGNI VOLTA	1
NUMERO PROGRAMMI DA ESEGUIRE	99999
NUMERO DI PANNELLI CARICATI	0,00
RIPRESA DELL'ETICHETTATURA	0
PANNELLO ACCOSTATO	0,00
PANNELLO SOTTILE	0
PRESSIONE DI ACCOSTAMENTO FORZATA	0,00
CICLO DI SCHIACCIATURA DEL PANNELLO	0
CARICO CONTINUO DELLE PILE	0
MINIMO SPESSORE PANNELLO MARTIRE [-]	-1,00
NUMERO VENTOSA PER DISTACCO PANNELLI	0,00
PANNELLO TRASPIRANTE	0

- SPOILBOARD THICKNESS.
- THICKNESS OF THE LAST STACK PIECE.
- NUMBER OF PIECES TO BE LOADED AT A TIME.
- NUMBER OF PROGRAMS TO BE RUN.
- NUMBER OF LOADED PANELS.
- RESUMING THE LABELLING.
- PUSHED PANEL.
- THIN PANEL.
- FORCED PUSHING PRESSURE.
- PANEL CRUSHING CYCLE.
- CONTINUOUS STACK LOADING.
- MINIMUM SPOILBOARD THICKNESS.
- NUMBER OF SUCTION CUPS FOR PANEL DETACHMENT.
- BREATHABLE PANEL

6. Prepare the machine for the automatic movement of the machined pieces from the work table to the unloading belt, and pick up the single pieces from the surface manually.

8.5. Unloading machined pieces

The operations for transferring pieces from the work table to the unloading belt are carried out automatically at the end of the machining operation only if the machine is in AUTOMATIC mode (see interface user instructions) and only after prebooking the unloading consent. For the description, (see paragraph [Unloading pieces onto the unloading belt](#)).

If necessary, it is still possible to move the unloader manually to deposit the pieces on the unloading conveyor.

Manually unloading the pieces

To transfer the pieces manually from the work table to the unloading belt, check that the machine is in MANUAL MOVEMENTS mode, and there is no operation under way. Activate the “[Piece unloading](#)” icon, the window "MANUAL UNLOADING" is displayed. Fill it in and follow the procedure described in the following paragraph.



Unloading pieces onto the unloading belt.

To unload machined pieces from the work table to the unloading belt, proceed as follows:

1. Wait for button “[OK OUT](#)” on the unloading belt push-button panel to light up.
2. Check that the unloading belt is empty and press the above button to book the piece unloading; the button will start to flash. To deactivate this consent, press the button again before the loading/unloading operations begin, or pass through the photocell barrier.
3. Remove the pieces on completion of the automatic unloading operations, i.e. when the [START](#) indicator light stops flashing.

8.6. Procedure to carry out a machining operation without the loading/unloading unit

To carry out the machining operation, loading and unloading the pieces manually (without using the loading/unloading unit), observe the following procedure:

1. Create a machining program (see the interface User Manual).
2. Tool the machine, if necessary (for information, see “[Tooling](#)”). If the spoilboard is used, see paragraph [8.14](#) to modify its dimensions.
3. From the software interface, launch the machining program previously created (see the interface User Manual), then activate the “[start](#)” icon (control panel). The machining program could contain instructions that allow you to suspend the machining operation (see the interface User Manual).
4. Activate the stop line that you wish to use for the machining operation (see paragraph [8.8](#)).
5. Select a work table origin (see paragraph [8.9](#)).
6. Load and lock the piece on the work table (see paragraph [8.10](#)).
7. Press the flashing “[START \(1,2,3,4\)](#)” button to run the machining operation. Once the machining operation is under way, if you pass through the photocell barrier, for example to check the correct clamping of the piece, it will be necessary to reset the photocell barrier.
8. Unloading the piece.

8.7. Program simulation

Before running the machining program, it is possible to simulate it in order to check the correctness of the operations that the machine will carry out.

These operations can be simulated via video (i.e. visualised in the PC software interface) with the machine not running, or they can be simulated directly on the machine.

Simulation on video

To simulate the machining program in the PC interface software, proceed as described in the Interface User Manual.

Simulation on the machine

To simulate the program directly on the machine, activate the “[Deactivation of tool rotation](#)” icon (see paragraph “[Soft console](#)”) on the control panel, and proceed as if you were carrying out a normal machining operation, but without locking the piece on the work table.

When the machining operation is started with this function activated, the spindles do not turn and the curtain guards protecting the operating section are not lowered, thus allowing better observation of the movements of working units.



When the function that prevents tool rotation is deactivated (see the “[Deactivation of tool rotation](#)” icon in paragraph “[Soft console](#)”), the working units lift up, even if an emergency stop has been triggered. If necessary, perform a machine reset (see paragraph 6.10) before disabling this function.

8.8. Activate stop line

To carry out a machining operation it is first necessary to activate a stop line. Before activating it, bear in mind the worktable origin you want to select as each origin is located on a specific stop line.

The stop line could be activated in different ways:

- Using the icon “**Activation of stop lines**”.
- Via the insertion of a special instruction in the program (see the **Interface user manual**).

8.9. Selecting the origin

To carry out a machining operation it is necessary to select any one of the work table origins (see paragraph [3.4](#)).

The origin of the worktable is selected by pressing the “START (1, 2, 3 & 4)” button on the working area button pads.

Table of the origins that can be selected with the START buttons.

Button	Selected origin	Stop line active
START 1	1	First
START 2	2	Second

According to the dimensions of the piece along the Cartesian X-axis, as defined in the program being run, the machine will automatically enable the origins on which it is possible to carry out the machining operation, lighting up the relative “START (1, 2, 3, 4)” button.

The origin to be selected may also be specified in the program, by entering a specific instruction (see the Software User Manual). In this case, the machine will only light up the “START (1, 2, 3, and 4)” button that corresponds to the origin specified in the program.

If locking with clamp stop plates is not enabled, the stops are raised after the origin has been selected.

If the operating section is close to the selected origin, before approaching the worktable wait until it has moved and then stopped.

8.10. Locking the piece on the work table

According to the characteristics of the piece, it is possible to select various locking methods:

- Standard locking.
- Locking with the help of spoil board.
- Locking using suction cup supports.
- Locking the panel on the spoilboard with the shapeable suction cups.

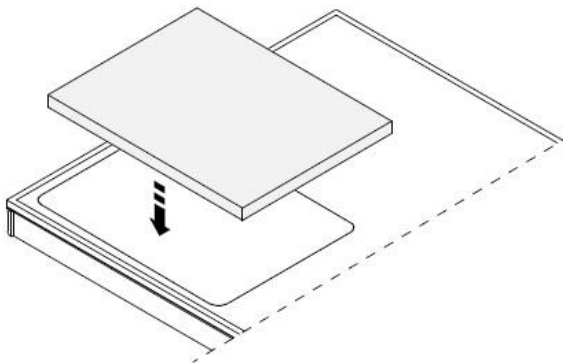
Standard locking

Standard locking is performed using the vacuum system, positioning the pieces directly on the table in question. The area in which the pieces are positioned must be limited by sealing gaskets. If necessary, clean the surface of the table before locking.

To lock the piece, proceed as follows:

1. Set the piece on the table and position it, if necessary, against the stops.
2. Press on the piece for it to attach properly to the worktable and lock it by pushing the pedal. After locking, make sure that the piece is perfectly sealed.

To release the piece briefly in order to correct its position, keep the respective pedal pressed.



Locking with the help of spoil board

This type of locking is made with the help of the vacuum system, positioning the pieces on the support panel fixed to the table. If necessary, clean the surface of the panel before locking.

To lock the piece, proceed as follows:

1. Set the piece on the panel and position it, if necessary, against the stops.
2. Press the piece so that it adheres well to the martyr panel, and then lock it by pushing the relative pedal. After locking, make sure that the piece is perfectly sealed.

To release the piece briefly in order to correct its position, keep the respective pedal pressed.

Locking using suction cup supports

This type of locking is normally used only during through machining operations in order not to damage the surface of the table. In this case, install the supports and the shapeable suction cups (see [chapter 12](#)) on the table according to the dimensions and shape of the piece to be locked.

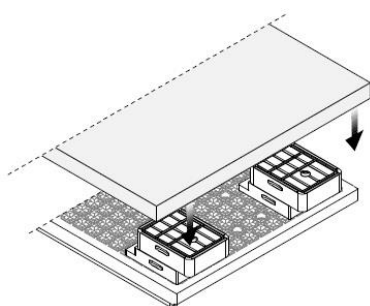
To lock the piece, proceed as follows:

1. Check that the spoilboard Levelling icon is disabled. Deactivate it if enabled.
2. Set the piece on the shapeable suction cups and position it, if necessary, against the stops.
3. Press on the piece to make it adhere well to the shapeable suction cups, then lock by pushing the pedal. After locking, make sure that the piece is perfectly sealed.

To release the piece briefly in order to correct its position, keep the respective pedal pressed.



Block the piece using the maximum vacuum value possible. If the available vacuum value is lower than -0.4 bar, the use of the supports is forbidden.



Locking the panel on the spoilboard with the shapeable suction cups

This kind of locking is usually used for the through boring operations. In this case, install the shapeable suction cups on the spoilboard according to the dimensions and shape of the piece to be locked.



The operator is responsible for the proper positioning of the suction cups. The machine is not fitted with positioning sensors.



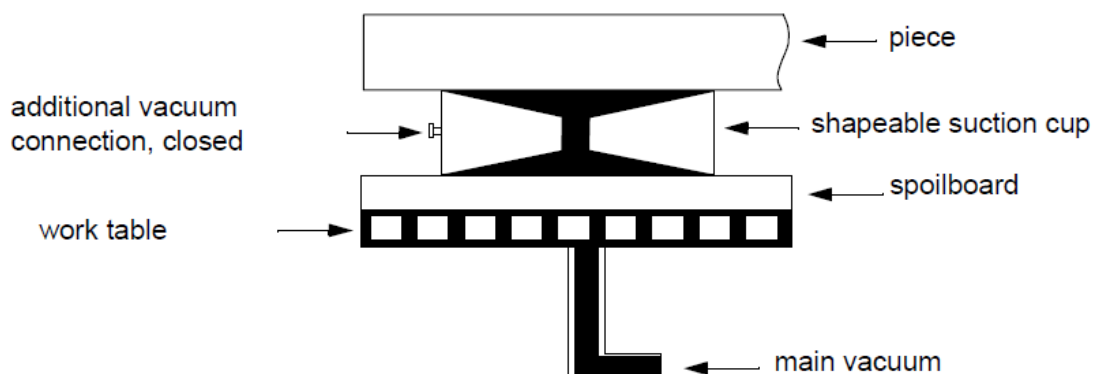
Before locking, check the flatness of the spoilboard.

To lock the piece, proceed as follows to use the main vacuum system only:

1. Place the shapeable suction cups on the spoilboard.
2. Set the piece on the shapeable suction cups and position it, if necessary, against the stops.
3. Press the special pedal to lock both the shapeable suction cups to the spoilboard and the panel to the suction cups.
4. Make sure that the piece is perfectly sealed.



Block the piece using the maximum vacuum value possible. If the available vacuum value is lower than -0.4 bar, the use of the supports is forbidden.



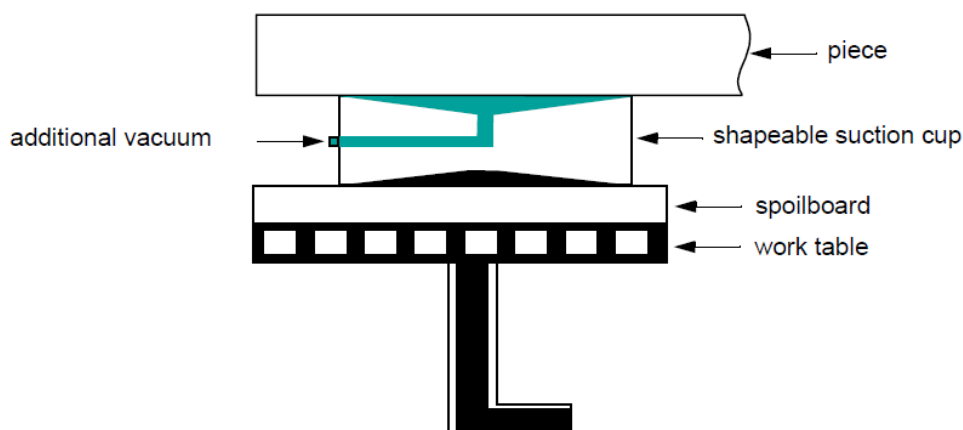
To lock the piece using both the main and the additional vacuum systems, proceed as follows:

- 1 Prepare the shapeable suction cups to use the additional vacuum system.
- 2 Connect the pipes of the additional vacuum system to the shapeable suction cups.
- 3 Place the shapeable suction cups on the spoilboard.
- 4 Press the pedal to lock the shapeable suction cups to the spoilboard.
- 5 Activate the additional vacuum system to lock the piece to be machined to the shapeable suction cups.
- 6 Set the piece on the shapeable suction cups and position it, if necessary, against the stops. Lock the piece to the shapeable suction cups by pressing the pedal.
- 7 Make sure that the piece is perfectly sealed.

To release the piece briefly in order to correct its position, disable the additional vacuum system by pressing the pedal.



Block the piece using the maximum vacuum value possible. If the available vacuum value is lower than -0.4 bar, the use of the supports is forbidden.



8.11. Starting the machining operation

Press the flashing button “**START (1, 2, 3 & 4)**” to run the machining operation. In the case of pendular machining, the machine will only start the next machining operation after it has completed the current one. Once the machining operation is under way, if you overstep the photocell barrier it will be necessary to reset the functions.

8.12. Activation of piece movement devices

The machine is fitted with certain devices (bar supports, etc.) that facilitate movement of the piece during the loading/unloading phases. To activate them, use the “Activation of piece handling devices” icon.

8.13. Piece unlocking and unloading

The piece is generally released automatically at the end of the machining operation. If it does not release, you must press the locking pedal for the working area concerned.

Piece unloading once the machining program has finished

- To unload the piece, lift it from the work table.

8.14. Machine monitoring - Sophia IoT

The machine can be equipped with a monitoring system to indicate its status and operating data. The monitoring action provides a constant check of efficiency and productivity. The monitoring system is used by the manufacturer, and can be used by the operator thanks to an APP.

To access the service, the following steps are required:

- Registration.
- Machine activation.

This is the link where you can get more information about the service:

<http://sophiaplatform.com/it/>

8.15. Spoilboard thickness management

By default, the management of the support panel thickness is made by filling in the appropriate fields in the machining program (see the Interface user manual).

To quickly modify the data relating to the thickness of the support panel without changing the machining program, observe the following procedure:

- 1 In the numerical control software, activate the MANUAL MOVEMENTS environment (see the Interface user manual).
- 2 Activate the “[Spoilboard](#)” icon; the numerical control software will display a new dialogue box.
- 3 Define the thickness of the support panel in the appropriate data field (see the Interface user manual).

Support panel thickness

The thickness of the support panel may be between **8mm** and **25mm**.

To ensure optimum results, the density of the support panel must respect the values shown in the table:

Physical-mechanical characteristics	
Nominal thickness range (mm)	Density (kg/m ³)
8-12	780 ± 5%
> 12-19	760 ± 5%
> 19-25	730 ± 5%



The manufacturer cannot be held responsible for any vacuum problems if the spoilboard density does not comply with these characteristics.



To prepare the spoilboard, you are advised to remove (by milling) the dense, impermeable surface layer from both sides.

8.16. Levelling the spoilboard

To level the spoilboard, observe the following procedure:

- 1 Carry out the machining program by activating the support panel leveling cycle within the piece parameters. Enter a value of not more than 10mm as the machining depth (see the Interface user manual). When creating the program, the Z dimension of the piece must not be greater than 20mm, while the X/Y dimensions must be more than 1000mm.
- 2 Activate the “[Leveling](#)” icon and run the program.

8.17. Managing the operating section parking mode

Before or at end of the machining operation, the operating section automatically positions itself in one of the pre-set parking areas. The machine can be fitted with two or three parking areas, depending on the quantity of working areas it has:

- Two parking areas in the case of one working area, the machine chooses the parking area according to a specific procedure that can be selected using the “Parking mode” icon (see paragraph “[Soft Console](#)”).
- If the LED on the icon is switched off and the piece being worked is of short or medium length, and the machine has two working areas, the operating section is parked in the following way:
 1. In the right hand lateral area, if the origins selected are the central left ones.
 2. In the left hand lateral area, if the origins selected are the central right ones.
 3. If LED of the icon is switched off and the piece being worked is of short or medium length, and the machine has only one working area, the operating section is parked on the side opposite to that of the selected origin.
 4. If the LED of the icon is off and the piece being machined is long*, parking is performed on the side opposite to that of the selected origin.
 5. If the LED of the icon is on, the operating section is always parked in the side area opposite the loading area.
 6. If the LED on the icon is flashing, the operating section is always parked in the central area (function active only on machines with two working areas).

* For clarification on the definition of short, medium or long piece, refer to the user interface manual.

9. Troubleshooting

This chapter describes how to solve any problems that may arise during use of the machine.

9.1. Problems, causes and solutions

Should a problem occur, first check for any messages on the numerical control screen; if there is no message, deal with the problem by consulting the table provided in this chapter or, should no indications be provided, contact the Service Centre.

Problem	Cause	Solution
The numerical control does not switch on.	Lack of power supply.	Check the machine's main power switch is turned to 1 (ON).
	A thermal switch of the electric panel has blown.	Reset the switch.
The start button on the main control panel does not light up.	There are emergency devices activated.	Check the emergency button.
		Check the emergency cords.
		Check the doors of the safety fence.
		Check the position of the cut- out valve located in the FR unit.
	The bulb is broken.	Substitute the bulb.
The piece does not remain blocked.	The filters on the vacuum system or the vacuum pump are dirty.	Clean the filters.
	The electric valves are faulty.	Check the electric valves.
	The tubes connected to the vacuum system are damaged.	If bent, straighten them manually and check sealing capacity. If broken, replace with new tubes. Do not repair them with adhesive tape or glue.
	The vacuum pump motor rotates in the wrong direction.	Do not use the machine, and report the problem at once to Service Centre.

Problem	Cause	Solution
The machine axes do not move and no errors are visualised.	The remote override knob is set to minimum.	Turn the knob slowly until it is in the correct position.
The machining operation does not start.	The functions of the contact mat have not been reset.	Reset the functions of the mat (see the chapter regarding the use of the safety devices).
During a work cycle, some of the spindles in the boring unit do not descend when invoked by the program.	The spindle shaft is dirty or oxidized. This can happen when the spindles are not often used.	Clean the spindle shaft.
	There may be problems in the electric or pneumatic system.	Consult the circuit layouts or contact the Service Centre.
During the work cycle, the stops do not move into position or do not descend.	There are deposits on the rods.	Remove the deposits with a clean dry cloth or a bronze wire brush.
	The piece has been pressed too hard against the stops.	Unlock the piece and repeat the positioning operation.
	There may be problems in the electric or pneumatic system.	Consult the circuit layouts or contact the Service Centre.
The spindles on the boring unit rotate in the wrong direction.	The live wires in the power supply terminals, inside the electrical cabinet, are inserted in the wrong order.	Switch off the machine and contact the Service Centre.
The machining operation quality is poor.	The tool is not suitable for the type of work being carried out, or the tool is worn.	Replace the tool.
	The speed of the tool movement and/or rotation is not suitable for the type of material being machined.	Adjust the parameters of the tool movement and/or tool rotation speed.
The axis has reached the end of its stroke and has come into contact with the mechanical stop.	Wrong manoeuvres have been carried out.	Reset the machine.
	Axis drive system malfunction.	Contact Service Centre.

Problem	Cause	Solution
The electrospindle vibrates.	The collet spindle is not balanced.	Choose a collet spindle based on the indications given in the appendix (paragraph 15.3), in the chapter relating to the technical characteristics of the collet spindles.
	The tool is not balanced.	Choose a tool based on the indications given in the chapter relating to the preparation of the operating section.
	Dirt in the spindle coupling area and/or on the conical couplings of the collet spindles.	Remove any impurities as described in the chapter relating to the maintenance of the electrospindles and the collet spindles.
	The bearings are damaged.	Do not use the machine, and report the problem at once to the Service Centre.
The bearings of the electrospindle are noisy.	The bearings are damaged.	Do not use the machine, and report the problem at once to the Service Centre.
The unloading belt is not working.	Emergency cord enabled	Restore the emergency cord
The tool is not picked up nor unloaded into the magazine.	Air is lacking in the system.	Check the presence of air in the system.
	The collet spindle is dirty	Clean and check for chips.
	The magazine is damaged.	Contact the customer service.
General print quality problems.	The printer's level of intensity is incorrect.	Set the lowest possible intensity in the application.
	The print head is dirty.	Clean the print head and roller.
Print adjustment failure on the labels. Excessive vertical shift on the upper adjustment.	The roller is dirty.	Clean the print head and roller.
	Incorrect support loading.	Load the support correctly.
Several labels have long strips that are empty.	The printing element is dirty.	Contact the customer service.
The printout is too light or too dark on the entire label.	The printer's level of intensity is incorrect.	Set the lowest possible intensity in the application.
Incorrect adjustment and printing on one-three labels.	The roller is dirty.	Clean the print head and roller.

Problem	Cause	Solution
Vertical shift in the upper position.	The roller is dirty.	Clean the print head and roller.
A vertical shift occurs in the image or label.	The roller is dirty.	Clean the print head and roller.
	Incorrect support loading.	Load the support correctly.
Creases on the belt.	Incorrect belt loading.	Load the belt correctly.
	The support does not advance correctly or shifts	Make sure the support is positioned properly, adjusting the relative guide. If necessary, contact the Assistance Service.
	The print head or roller may have been installed incorrectly.	Contact the Service centre.

10. Preparing the operating section

This chapter contains all the information required to prepare the operating section to carry out machining.

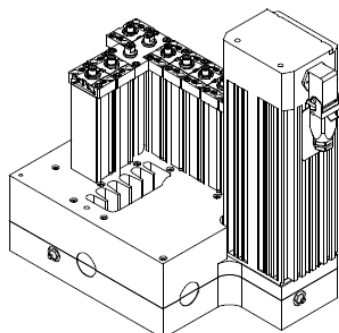
10.1. Installing tools

To install the tools in the operating section, position the section at a point allowing the best possible access to the spindle in question and, if necessary, lower the unit or the spindle.

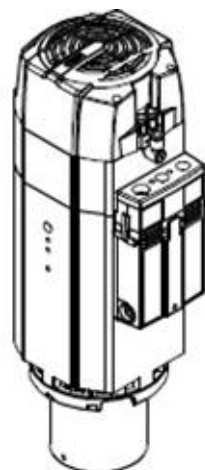


Certain additional information on tools, that might be of use when tooling up the units, such as the spindles direction of rotation, the size of wrenches to be used and, if foreseen, the type of collet used, is given in the appendix (paragraph 15.3).

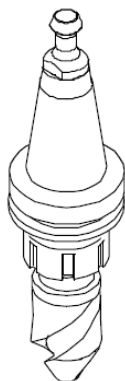
- To install the tools in the boring unit, see the paragraph [“Installing the tools in the boring unit”](#).



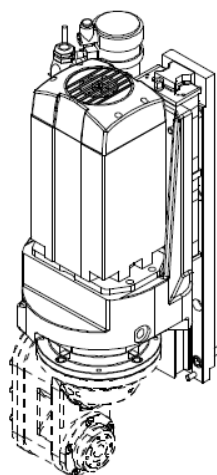
- To install the tools in the electrospindle, consult the following paragraphs: [“Installing the tools & aggregates in the electrospindle”](#).



- To install the tools in the collet spindles, see ["Installing the tools in the collet spindle"](#).



- To fit the tools in the multifunction unit, see the [Aggregate UserManual](#).



When tooling has been completed, the data must be entered in the numerical control software (see the [Interface user manual](#)).

10.2. Characteristics of the installable tools

A vast range of tools with special characteristics can be used on the working units:

- Boring tools: bits of various types for boring operations.
- Milling tools: cylindrical shank milling cutters or with ISO 30 and HSK F63 coupling for milling operations.
- Cutting tools: circular blade tools for grooves or sectioning cutting.

For information on the tools to be used with the aggregates, refer to this paragraph. The missing data is provided in the Aggregate User Manual.



Only use tools that comply with EN 847-1 and EN 847-2 specifications on the machine, and always comply with the specifications for use indicated by the manufacturer.



For the advance speed, use the data provided by the supplier (taking into account the piece locking system).



Do not install several tools with different max. rotation speeds on the same aggregate.



Never use tools beyond the speed limit, which is stamped on the surface of the tool or indicated by the manufacturer. If used at rotation speeds higher than those foreseen certain tools might break, causing pieces to fly out of the machine.



The maximum tool diameter indicated by the operator on the machine software must correspond to the real diameter.

It is necessary to record the tools that can be installed, in the machine software. To record the tool, some parameters must be entered (maximum diameter, rotation speed, etc.).

These values are entered according to the rotation speed values stamped or indicated by the tool manufacturer. These values must be entered to record the tool.

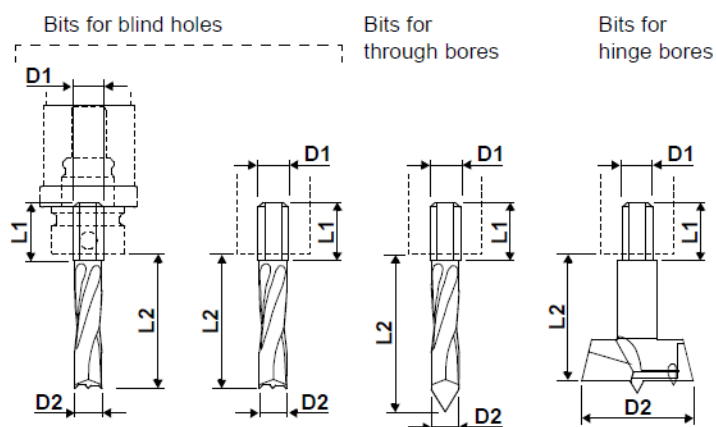
The entered values (maximum diameter and maximum rotation speed) will have to be confirmed.

For a more detailed description of how to enter the data in the machine software, see the user interface Manual.

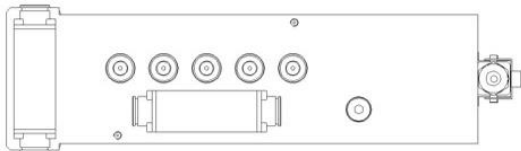
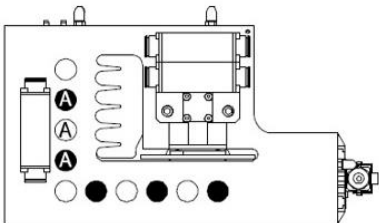
10.3. Checking the electrospindle tool locking

To carry out this check, fit a tool on the electrospindle present and, after stopping the machine, check manually to ensure they are perfectly locked. Also check that air is coming out of the electrospindle connection device area.

10.3.1. Bits



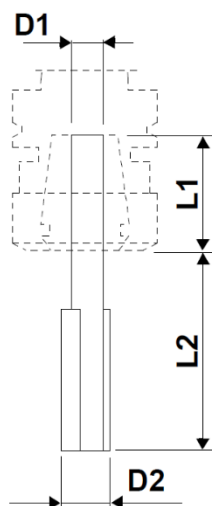
Bit dimensions (mm) according to the type of spindle used.

Spindles	Tool data (mm)			
	D1 max	D2 max	L1 min	L2 max
Vertical spindles of the boring units	10	20*	20	57**
Boring unit horizontal spindles	10	20	20	57**
Aggregate spindle	(see the Aggregate User Manual)			
BH 5 – BH 9 	BH 10 – BH 17 			
A = spindles in which it is not possible to install bits with a diameter (D2) greater than 30mm.				

* The bits for hinge bores may have a maximum diameter of 35mm.

** For some machine configurations, this data item may not be correct, so you are advised to always check the Layouts of the working fields.

10.3.2. Milling cutters with cylindrical shanks

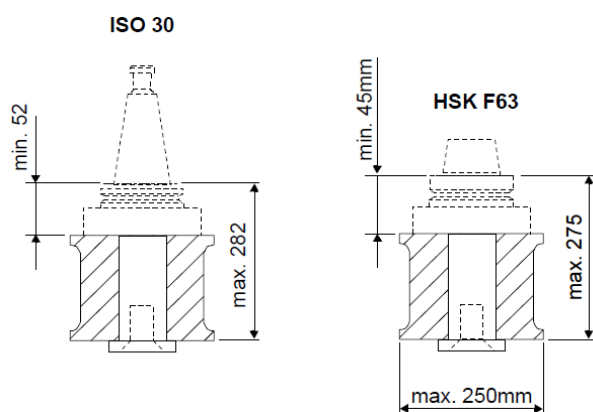


Dimensions of milling cutters with cylindrical shank (mm) according to the type of spindle used.

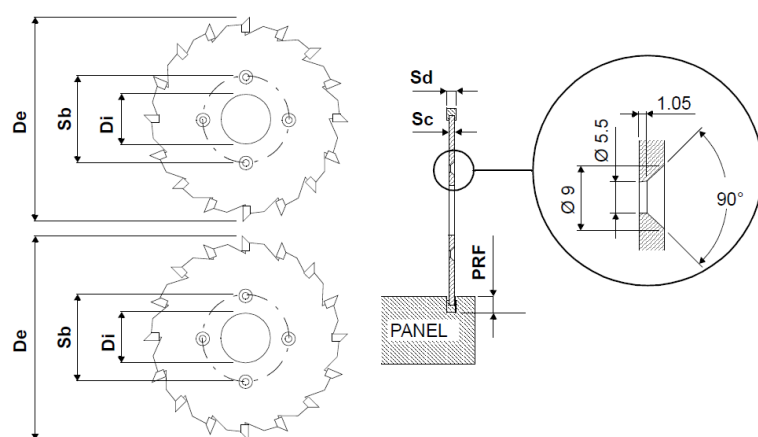
Spindles	D1 (Max mm)	D2 (Max mm)	L1 (Max mm)	L2 (Max mm)
electrospindle with ISO 30 coupling and ERC 32 collet	20	120	40	110
electrospindle with ISO 30 coupling and ERC 40 collet	25	160	46	130
collet spindle with HSK F63 coupling and ERC 40 collet	25	160	46	130
aggregate spindle	(See the Aggregate User Manual)			

10.3.3. Milling cutters with ISO 30 or HSK F63 coupling

These data concern the maximum dimensions of the tools that can be installed in the electrospindles. For the maximum dimensions of the tools that can be installed in the magazines, refer to the technical data given in the magazine layouts.



10.3.4. Circular blade tools



Blade dimensions (mm) according to the type of spindle used:

- De = maximum diameter.
- Sd =maximum blade thickness.
- PRF = maximum operation depth.

Spindles	Tool data (mm)					
	De	Di	Sb	Sc	Sd	*PRF
Boring unit spindle	120	35	50	2 ÷ 3	4	25
Aggregate spindle	(See the Aggregate User Manual)					

*These values can be applied to a machining operation carried out in a number of stages, to avoid damaging the unit or aggregate.

10.3.5. Installing the tools in the boring unit.

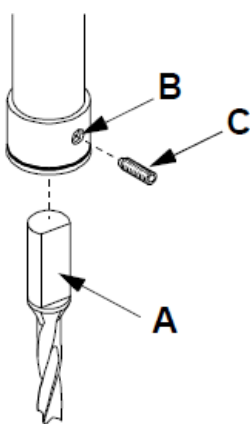
1. Stop the machine.
2. Pick up the tools and approach the unit required.
3. Install the tools as described below.

10.4. Boring tools

The boring tools can be fixed in various ways.

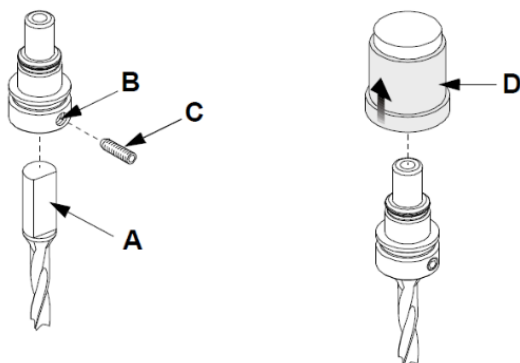
10.4.1. Fixing with lockscrew:

1. Insert the tool in the spindle, turning the fixing surface **A** towards the bore **B**.
2. Fix the tool using the lockscrew **C** provided.



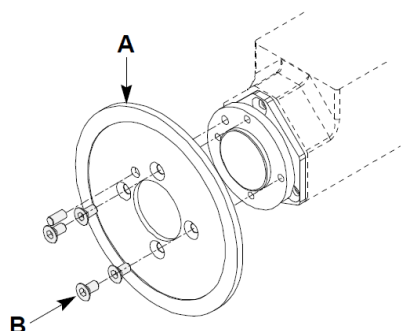
10.4.2. Fixing with the pre-inserted nut for snap-on coupling:

1. Insert the tool in the bush opening, turning the fixing surface **A**.
2. Turned towards the bore **B**.
3. Fix the tool using the lock screw **C** provided.
4. Slide the cylinder **D** upwards, insert the bush with the tool, and release the cylinder **D**.



10.5. Cutting tools

Insert the blade **A** in the spindle and lock it with the appropriate screws **B**.

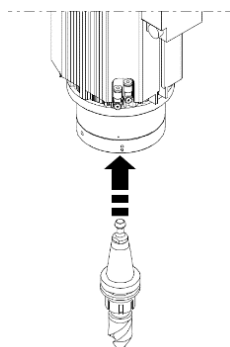


10.6. Installing the tools in the electrospindle

In general, the installation of tools in the electrospindle is managed automatically during machining operations, using the tool magazine.

If you want to install a tool manually, observe the following procedure:

1. Turn the selector “**Tooling**” on the control panel to the right and remove the key to prevent anyone from restoring the machine to normal operation.
2. Take the tool and move near the milling unit.
3. Command the opening of the electrospindle blocking collet, pressing the button “Multifunction” (“**Button pad for controlling the machine axes**”). If there is already a tool in the electrospindle, this is immediately released. In this case, before pressing the above- mentioned keys, be ready to catch it so it does not fall.
4. Insert the tool in the electrospindle and block it by releasing the button “Multifunction” (“**Button pad for controlling the machine axes**”,).



Given that a number of electrospindles are present, take the following precautions when carrying out this operation: check that the collet to be opened is the right one; do not stand under the milling unit.

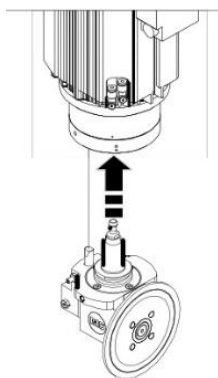


The electrospindle can only house tools fitted with the appropriate collet spindle (see “**Installing the tools in the collet spindle**”).

10.7. Installing the aggregates in the electrospindle

In general, the installation of aggregates in the electrospindle is managed automatically during machining operations, using the tool magazine.

For the procedures regarding the manual installation of the aggregates, consult the [Aggregate User Manual](#).



The electrospindle can only house aggregates with an ISO 30, HSK F 63 coupling.

10.8. Installing the tools in the collet spindle

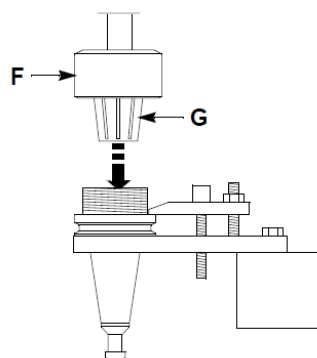
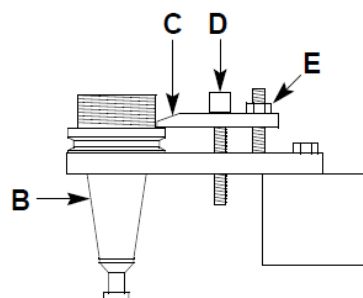
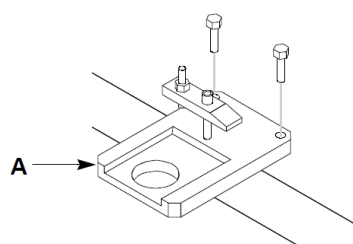


For safety reasons, the collet spindles used on the machine must only be supplied by the manufacturer.

Follow the instructions provided below, according to the type of collet spindle.

ISO 30 collet spindle

1. To facilitate assembly operations, a special piece of equipment is provided (ref. **A**) which must be anchored to a fixed support (e.g. a tool bench) using the relative bores.
2. Position the spindle coupling **B** in the equipment. Turn the bracket **C** until it is positioned on the spindle and adjust the screws **D** and **E** to lock it.
3. Remove the ring nut **F**, turning it clockwise if the spindle is a left-hand one or in the opposite direction in the case of a right-hand spindle.
4. Insert the collet **G** in the housing provided on the ring nut **F**.
5. Insert the tool shank in the collet and replace the ring nut **F**.



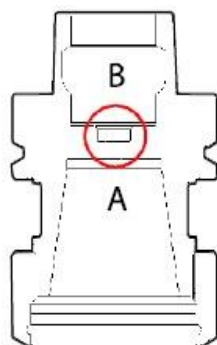
HSK F63 collet spindle



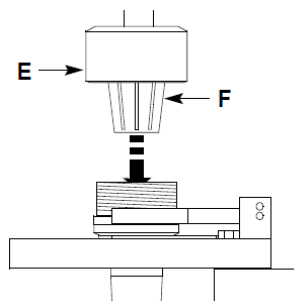
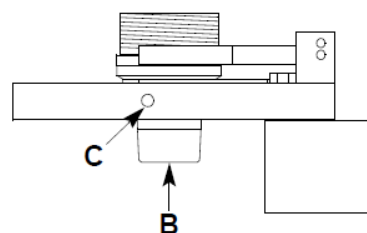
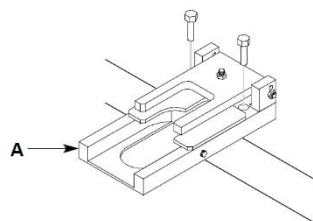
The HSK F63 collet spindle used in the Air Tool electrospindles must only be purchased from the manufacturer.



On the HSK F63 collet spindle used in the electrospindles, compartment A and compartment B must be non-communicating.



1. To facilitate assembly operations, a special piece of equipment is provided (ref. A), which must be anchored to a fixed support (e.g., a tool bench) using the bores provided.
2. Position the spindle coupling B in the equipment and tighten the lockscrew C to lock the spindle.
3. Remove the ring nut E turning it clockwise if the spindle is a left-hand one or in the opposite direction in the case of a right-hand spindle.
4. Insert the collet F in the housing provided on the ring nut E.
5. Insert the tool shank in the collet and replace the ring nut E.



11. Preparing the magazines

This chapter explains the procedures to prepare the tool magazine.



The tools equipped with the dedicated collet spindles are housed in the Rack tool magazine.

When tooling an empty tool holder with a tool/aggregate, the following machine data must be modified (see tool magazines layout):

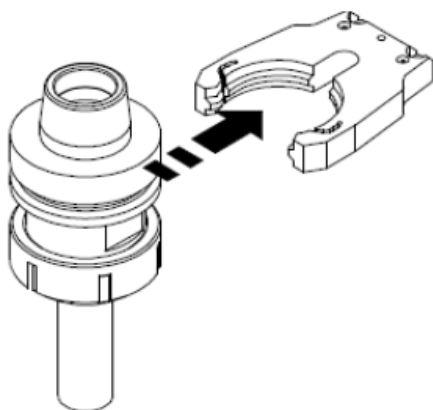


- **Release offset in case of a tool.**
- **Release and orientation offset of C axis in case of an aggregate.**
- **An incorrect C axis release or orientation value could cause a collision.**

11.1. Preparing the Rack tool magazine

For the housing procedures, observe the following indications:

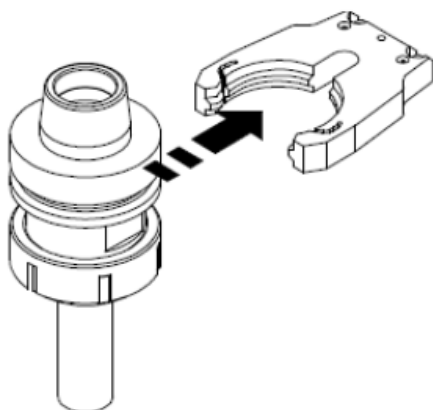
1. Move carriage X so as to free the magazine.
2. Turn the selector "Tooling" on the main control panel to the right, and remove the key to prevent anyone from restoring the machine to normal operation.
3. Pick up the tools and get close to the magazine concerned.
4. Position the tools in the tool-holders, as shown below.
5. The data must be entered in the machine control software (see the interface User Manual).



11.2. Preparing the Moving tool magazine

For the housing procedures, observe the following indications:

1. Press the icon “[Open tool magazine](#)” (see page [62](#)). The X Axis will move on the left side (X-) of the machine, the cover will open and the rack will go up.
2. Operator must move manually the X axis in JOG+, will be able to clear the magazine area and reach the tool holders (which remained high) so that they could be equipped.
3. Activate the SATT tooling selector (the rack remain high), see paragraph [5.2](#).
4. Position the tool in the tool-holders, as shown below.



5. Once the operator has finished tooling the cones in the tool-holders, press the icon “tool magazine” again (see page [62](#)). The X-axis will move back over the magazine, lower the rack, and close the magazine.

11.3. Tools and aggregates that can be used, and their direction

The tools and aggregates that can be housed in the magazines are listed in the layouts.

To house the tools/aggregates, you must observe the following rules:

- Respect the orientation shown in the layouts, which refers to the aggregate in the pick-up position.
- The tools/aggregates must not exceed the maximum dimensions position shown in the various layouts, to avoid any collisions with the machine parts when the magazine is rotating.
- Respect the positions indicated in the layouts because, during the installation of large aggregates or tools, it may be impossible to house other tools or aggregates in the adjacent, previous or subsequent positions.

12. Preparing the work table

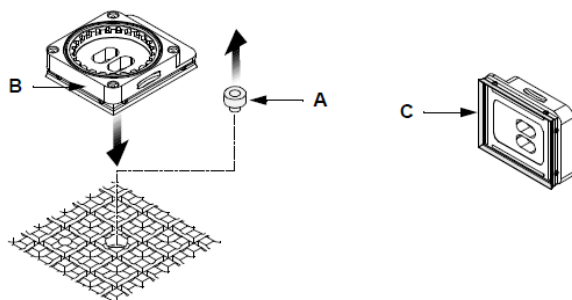
This chapter explains the procedures for preparing the work table.

12.1. Installation of suction cup supports

The supports are positioned on the work table at the required points, corresponding to the connecting bores for the vacuum system.

Proceed as follows to install the supports:

1. Remove the plugs **A** from the connecting bores for the vacuum system.
2. Fit the support **B** being careful to match the rubber tab **C** and the relative grooves on the work table.



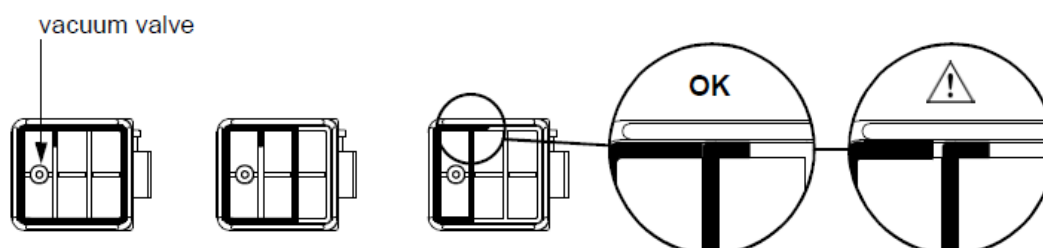
After installing the supports, modify the software interface of the machine for the data regarding the work table origin (see the interface User Manual).

12.2. Installing the shapeable suction cups

To install the shapeable suction cups, place them on the suction cup support in one of the 24 possible positions (each corresponding to an angle of 15°). Before positioning the suction cup on the support, make sure the latter is clean.

12.3. Installing the gasket on the shapeable suction cups

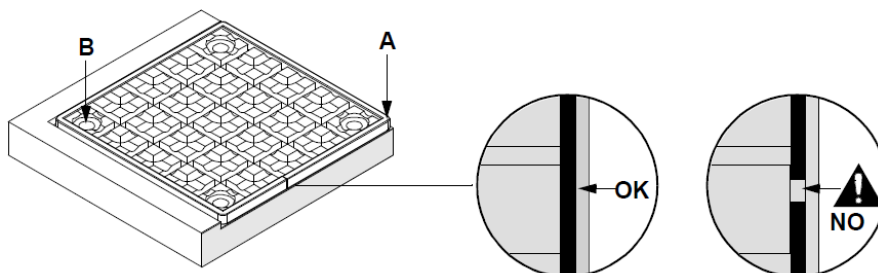
Install the gasket into the channels on the suction cups, so as to create an area around the vacuum valve. Various examples are given in the figure below.



The gasket must seal perfectly at the joint, to ensure the piece does not get detached from the table during the machining operation.

12.4. Creating the piece locking areas on FT table

In order to be able to lock the pieces on the work table, it is necessary to create areas that correspond to the shape and size of the piece to be locked. These areas are created by positioning the gasket **A** (supplied) in the channels of the table and then removing the plugs **B** located within the area.



The gasket must seal perfectly at the joint, to ensure the piece does not get detached from the table during the machining operation.

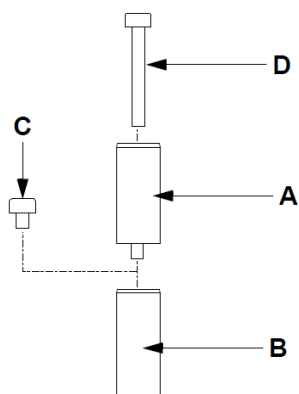
12.5. Installing the stop extensions

The stop extension (ref. **A**) is fixed on rods **B** of the stops.

To carry out the installation in comfort and safety, make sure that the standard stops are up and that the machine is in emergency mode. To do this, proceed as if you were carrying out a machining operation and then, when the stops are up (after selecting the origin), press the emergency button.

To install them, proceed as follows:

1. Remove screw **C**, which acts as a plug, from the stops on which to install the extension.
2. Insert the extension in rod **B**. After this, fix it in place using the screw **D**.

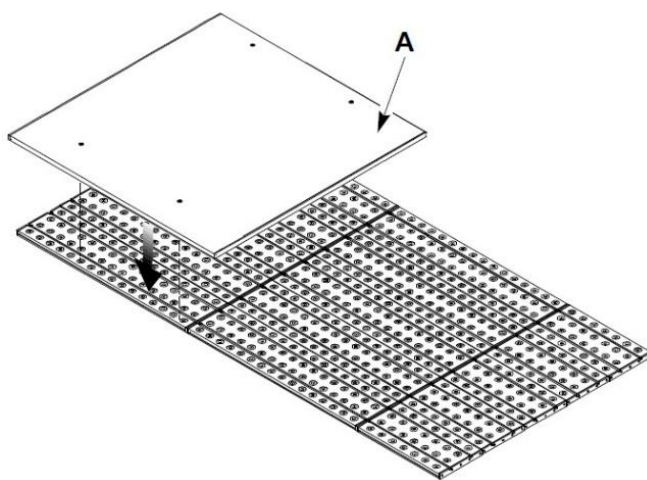


Screw D must be tightened to a locking torque of 15 Nm.

12.6. Preparing spoilboard

When using the support panel, observe the following indications:

1. Create the machining program to generate the bores to be applied on the martyr panel and then fix it to the table.
2. Run a levelling cycle.
3. Fix the spoilboard panel to the table.
4. Carry out the machining program generated (see [chapter 8 “Carrying out machining operations”](#)).

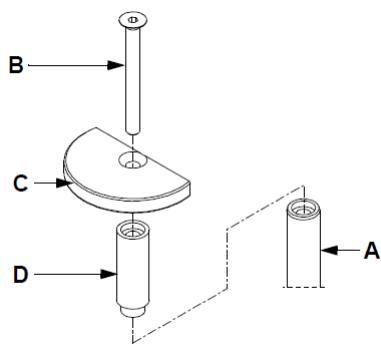


12.7. Installing the clamp stop plates

The installation of the plates allows the stops to be used as a piece locking device. They are normally installed when it is necessary to lock small pieces or pieces that it would not be possible to lock safely using the suction cups alone.

To install them, proceed as follows:

1. Remove the plug from the stop **A**.
2. Assemble the clamp, inserting the screw **B** into the plate **C** and into the spacer **D**.
3. Insert the assembled clamp into the stop **A** and fasten the screw **B**.



Do not install the clamp stop plates on the first line of stops.



Screw B must be tightened to a locking torque of 15 Nm.

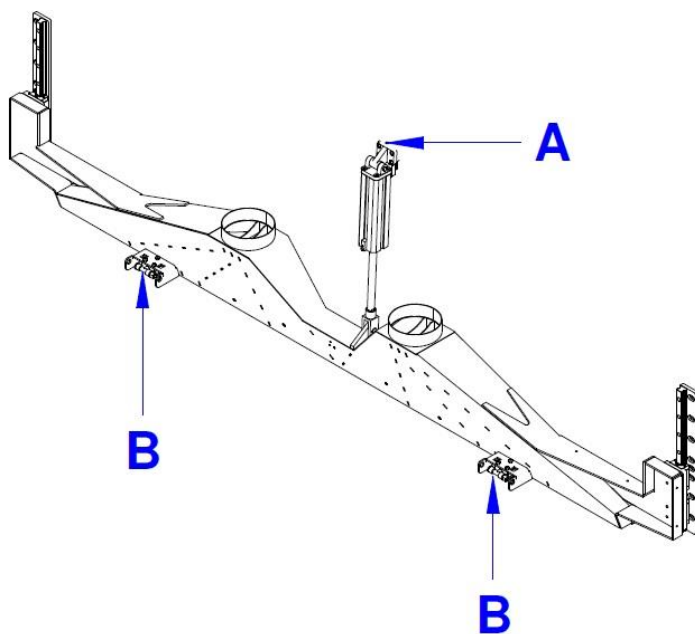
13. Adjustments

This paragraph explains the adjustments to be made on the machine.

13.1. Unloader adjustment

When using the support panel, in order to correctly unload the pieces you must adjust the unloader. The adjustment varies depending on the thickness of the panel used, and is carried out via the screw **A**.

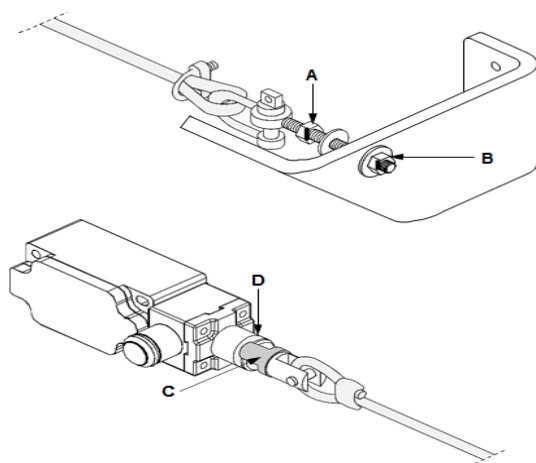
Copier type unloader '**B**' will be to the level of work table by "**Pneumatic stroke**", which is adjusted by based on the panel thickness.



13.2. Tightening the emergency cord

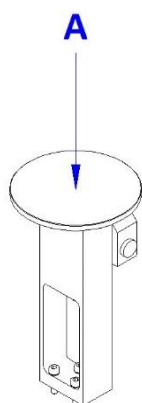
To tighten the emergency cord when it has come loose, observe the following procedure:

1. Loosen the nut **A**.
2. Tighten the nut **B** until you reach the required tension. The cord is tight when the black stop **C** is halfway along the green stripe **D**.



13.3. Adjusting the Pre-setter

In order to work correctly, the pre-setter device requires the periodical adjustment of the washer **A**.

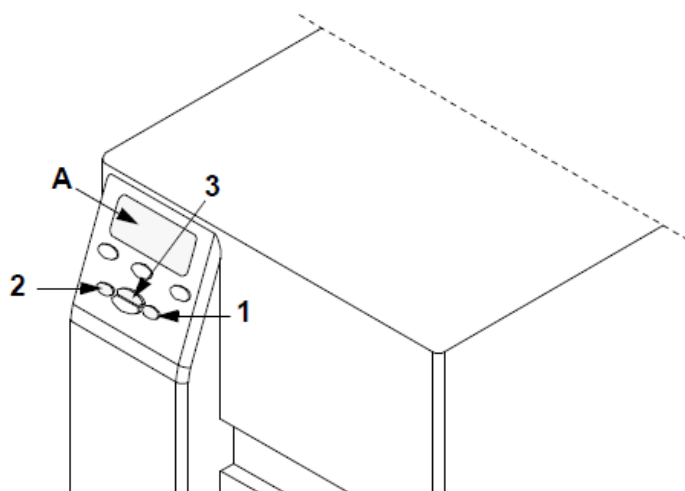


To carry out this operation, observe the following procedure:

1. Check the machine has been set to receive electrical energy (“Machine power” button and the “STOP” and “RESET” keys pressed).
2. Access the AUTOMATIC environment of the machine software (refer to the Interface user manual).
3. Press key “Pre-setter management”, a new dialogue box is displayed in the software of the machine.
4. Select the options relating to the alignment and/or the calibration of the Pre-setter device (see the Interface user manual).
5. Alignment relates to adjustment of the washer A, which must be aligned along the X and Y axes.

13.4. Adjusting the labelling machine parameters

In order to work correctly, some parameters of the labelling machine must be adjusted. Use the display A of the labelling machine control panel to visualise and adjust the printer settings.



Visualising or modifying the parameters

While visualising the parameters, press PLUS (1) to move on to the next parameter, or MINUS (2) to go back to the previous one. If you want to modify a parameter or visualise the relative options, press SELECT (3). When a parameter is modified, an asterisk (*) appears in the upper left-hand corner of the label printer display, to indicate that the value is different from the one currently set in the printer.

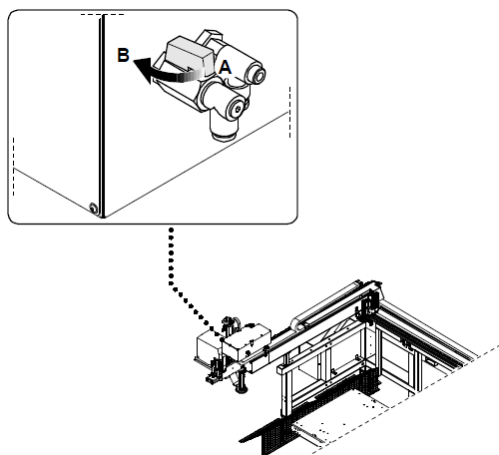
The table below shows the parameters that must be adjusted.

13.5. Adjusting the label applicator

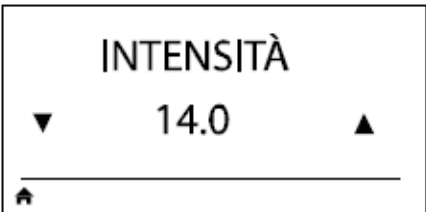
The depression of the label applicator must be adjusted according to the type of label used.

Valve in position **A**: to manage small labels (2" X 2" and similar).

Valve in position **B**: to manage medium/large labels (2" X 4" up to 4" X 4").



+

Parameter	Action/Description
 AZIONE ACCENS. ▼ FERM ▲ ⌂	This parameter sets the action performed by the printer during the activation sequence. Predefined value: STOPPED. To modify the value shown: 1. Press SELECT (SELECTION) to select the parameter. 2. Press PLUS (+) or MINUS (-) to scroll through the options. 3. Press SELECT (SELECTION) to accept.
 INTENSITÀ ▼ 14.0 ▲ ⌂	Set the intensity on the lowest level, which will enable good printing quality. If a very high intensity value is set, the label's image may not be printed clearly, or the barcodes are not analysed correctly, or the belt wears out excessively or the print head wears out prematurely.

14. Maintenance

This chapter contains information that is essential to maintain the machine in perfect working order.

14.1. Warnings relating to machine maintenance

Unless otherwise indicated, all maintenance operations must be carried out with the machine turned off. In particular, make sure that the main switch is set to the “0 off” position and that all the air has been drained out of the compressed air system by opening the cut-out valve. Both the main switch and the cut-out valve must be blocked with a padlock to prevent the machine from being turned on again.



Before any other operation, switch the machine off, turn the main power switch to OFF, close the cut-out valve and fit a padlock on both devices.



One of the pistons moving the electrospindle vertically remains under pressure, even when the cut-out valve has been triggered. This might cause the electrospindle to lower in two cases:

- In the case of tampering with the respective pneumatic pipes.
- In the case of air leaks from the pistons, when the machine is not used for a long period of time.

14.2. Forced lubrication

It is possible at any moment to run a lubrication cycle for the parts connected to the lubrication pump; press the key “Lubrication cycle”. When the lubrication cycle starts up, the timer indicating the time passed since the last lubrication cycle is reset to zero.

14.3. List of the maintenance operations to be carried out on the machine

The following table lists the foreseen maintenance operations (Intervention column), indicating the frequency with which each intervention is to be carried out (Frequency column) and, for the interventions that require it, the page on which the operations to be carried out are quoted.

Frequency	Part involved	Intervention
Daily. (every 8 working hours).	General machine	General cleaning of the machine.
	Safety devices	Inspection of the condition of the cams and their safety switches. If necessary, replace them.
	Work table	Inspection of the condition of the table gaskets, the suction cups and the jigs. If necessary, replace them.
	Operating section	- Inspection of the condition of the curtain guards. If necessary, replace them. - Checking the electrospindle tool locking. - Checking and cleaning the collet spindles. - Checking and cleaning the electrospindle
	Becker VTLF2.250 vacuum pump	Cleaning the cooling ducts
Weekly. (every 40 working hours).	General machine	- Cleaning the machine guides and racks. - Pressure check.
	Operating section	- Cleaning the C-axis. - Checking the connections of the electrospindles.
	Refrigerator	- Checking and topping up the coolant. - Cleaning the cooler.
	Heat exchanger	- Check the liquid level and top up if necessary with the same mixture. - Checking and cleaning the heat exchanger.
	FR unit	Cleaning the filter.
	Busch Mink vacuum pump.	Cleaning and replacing the air filters.
	Becker U 5.301/U 5.101 vacuum pump	- Checking the oil level and topping-up with oil. - Cleaning and replacing the air filter
	Becker VTLF2.250 vacuum pump.	- Cleaning the filters. - Cleaning the cooling channels

Frequency	Part involved	Intervention
Fortnightly. (every 80 working hours).	General machine	• Lubricating the X-drive devices (slide blocks and rack). • Lubrication of the Y and Z drive devices (slide blocks and lead nuts). • Loading pallet lubrication. • Roller presser support lubrication. • Lubrication of the loader / unloader.
Every month or every time the roll is changed	Labelling unit	• Cleaning the sensors • Cleaning the print head and roller • Cleaning the film peeler unit
Monthly. (every 160 working hours).	General machine	• Checking the tank and discharging the condensation
	Operating section	• Checking the connections of the electrospindles. • Lubricating the HSK F63 electrospindle release device.
	Electrical cabinet	• Interventions on the electrical cabinet
	Machine's PC operating system	• Updating the anti-virus system
Every 3 months. (every 480 working hours).	Busch Mink vacuum pump	• Check there is no dirt or dust in the pump; if necessary, clean it. • Checking the oil level.
After 500 working hours	Becker U 5.301/U 5.101 vacuum pump	• First oil change
Every 6 months or Every 2000 working hours.	Busch Mink vacuum pump	• Cleaning the fans and the cooling tubes
	Becker U 5.301/U 5.101 vacuum pump	• Changing the oil • Cleaning the oil separator filters • Checking and cleaning the fan
	Loading pallet (without labelling unit)	• Checking the oil levels of the hydraulic switching box.
Every 3000 hours or every year	Becker VTLF2.250 vacuum pump	• Lubricating the bearings.
Every 6000 hours	Becker U 5.301/U 5.101 vacuum pump	• Replacement of the oil separator filter

Frequency	Part involved	Intervention
Annually	Becker VTLF2.250 vacuum pump	Blade wear check
	Busch Mink vacuum pump	- Cleaning the net filter. - Replacing the oil.
	Refrigerator	Changing the coolant
	Heat exchanger	Changing the coolant
Periodically. (every 200.000 tool change operations)	Electrospindle	Collet spindle Contact the customer service.
*	FR unit	Replacing the oil separator filter cartridge
**	Lubrication pump	Topping up the lubrication pump
**	Operating section	Lubrication and cleaning of the boring spindle gears

* See the specific paragraph.

** When requested by the numerical control.



The shapeable suction cups must be replaced with original ones, supplied by the manufacturer.

14.4. Updating the anti-virus system

The updating of the anti-virus system does not take place automatically; it must be done manually for the entire period of the duration of the license.

Proceed as follows:

- From the machine's PC, go to the site <http://www2.biesse.it/home/antivirus.asp>.
- Click on "[Download antivirus update](#)" and download the file.
- Run the Avira Antivirus Professional application software, click on "[Update](#)" and "[Manual update](#)".
- Open the previously downloaded file. The update will start automatically.



The anti-virus system properly installed and maintained as described does not guarantee total protection. The manufacturer assumes no responsibility for any inefficiencies in the system.

14.5. General cleaning of the machine

Proper cleaning of the machine and the surrounding area will make the working environment healthier and safer, allowing commands and indicators to be identified with ease and without mistakes.

Use a vacuum cleaner to remove any wood chips, and if necessary use a compressor to remove fine dust, making sure you stand at a sufficient distance. To prevent the floor from becoming slippery, waste chips must be removed using a vacuum cleaner or brush.



Never use compressed air to clean the electrical cabinet; use a vacuum cleaner or soft cloth, as the dust removed might deposit on the electrical contacts and cause damage.



To avoid damaging the various operating section covers and presser sensors, clean them using soap and water only. Do not use thinners, degreasing agents, alcohol, benzene or any other chemical products.

14.6. Cleaning the machine guides and racks

Clean any deposits on the guides and racks using a cloth or a bronze wire brush.

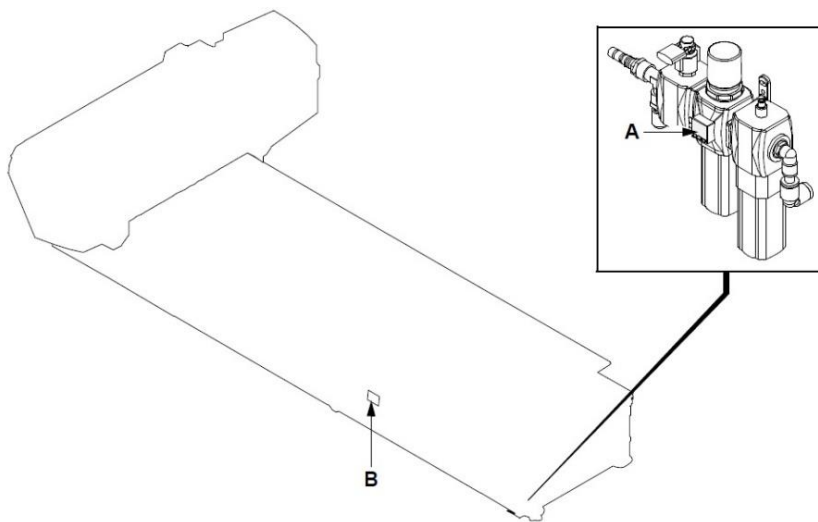
Using a brush, spread a thin layer of **KLUBER Paraliq GA 3400** lubricant on each rack.

14.7. Pressure check

The following illustrates and describes the pressure gauges on which the pressure must be checked at regular intervals.



If the pressure value is found to be incorrect, do not make any adjustments, but call the Service Centre.



- A.** Pressure gauge indicating the supply pressure = **7 bar**.
The supply pressure must be checked with the machine in emergency stop mode, without having activated the cut-out valve.
- B.** Pressure gauges that show the vacuum system pressure = about - 0.85 bar (- 12.5 psi, - 65 cm Hg, - 85000 Pa). The checking of the vacuum system pressure must be made by simulating a blocking without a piece.

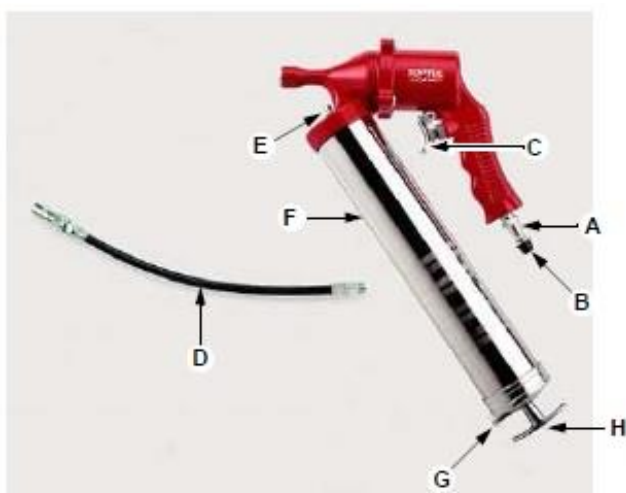
14.8. Topping up the grease level

To refill both various greasing points and the lubrication pump, use the greasing pneumatic gun supplied.



The gun is only supplied if the machine has its own automatic lubrication system.

Pneumatic greasing gun



- A. Air inlet.
- B. Quick connector.
- C. Trigger.
- D. Gun barrel.
- E. Top-up valve.
- F. Gun tank.
- G. Locking lever.
- H. Pushing lever.

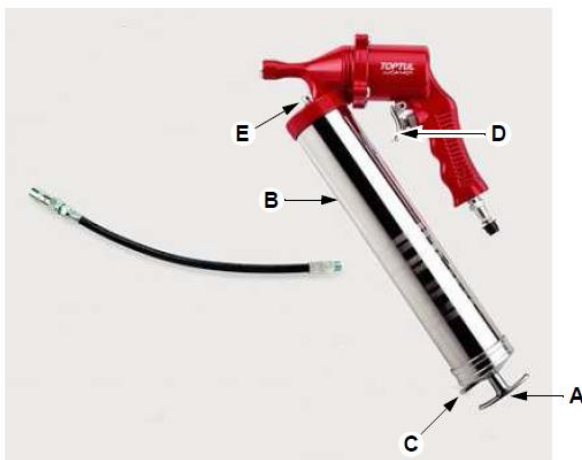
Technical Data

Air consumption	113 l/min
Tube diameter (recommended)	9 mm
Compressed air quality	Lubricated and clean
Recommended pressure	6 bar

Inserting the cartridge

Observe the following procedure:

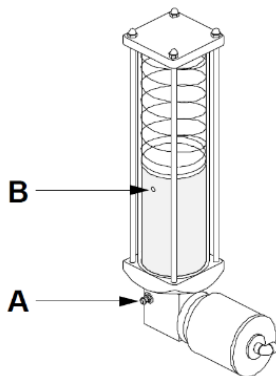
1. Pull the pushing lever **A** as far as it will go, then loosen the head of the gun tank **B**.
2. Insert the cartridge in the gun tank, remove the cartridge cap, and then tighten the head on the gun again.
3. Press on the blocking lever **C** and push the pushing lever until it is fully inwards.
4. Press the trigger **D** until grease comes out. The gun is self-purging.
5. Open the bleed valve **E** if the grease does not come out at once.



14.9. Topping up the lubrication pump

If the lubricant level in the pump has reached minimum, a message will appear on the numerical control. In this case, top up as described below.

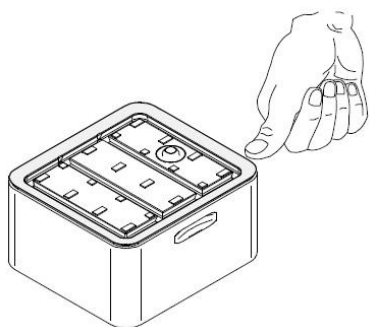
1. Fill the pneumatic greasing gun (supplied) with the type of lubricant indicated on the lubrication system **KLUBER Paraliq GA 3400** lubricant.
2. Insert the pump into the greasing nipple **A** and pump in lubricant until it seeps out through the bleed hole **B**, indicating that maximum level has been reached.



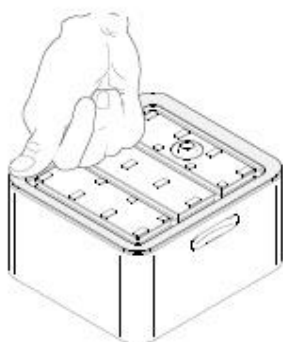
14.10. Replacing the outer gasket of the shapeable suction cups

To replace the outer gasket of the shapeable suction cups, follow the procedure below:

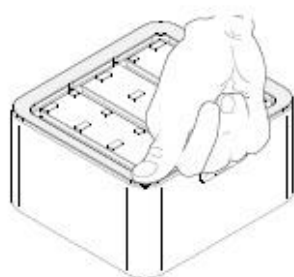
1. Insert the gasket, starting from any one of the corners.



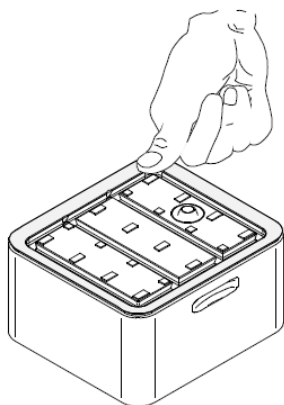
2. Insert the gasket in the opposite corner.



3. Insert the gasket in one of the two remaining corners.



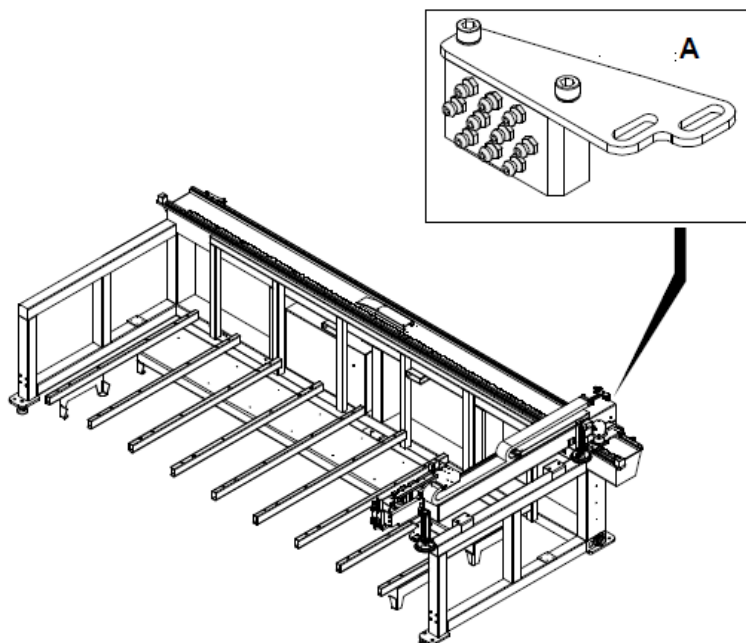
4. Insert the gasket in the last corner.



5. Fit the whole gasket in.

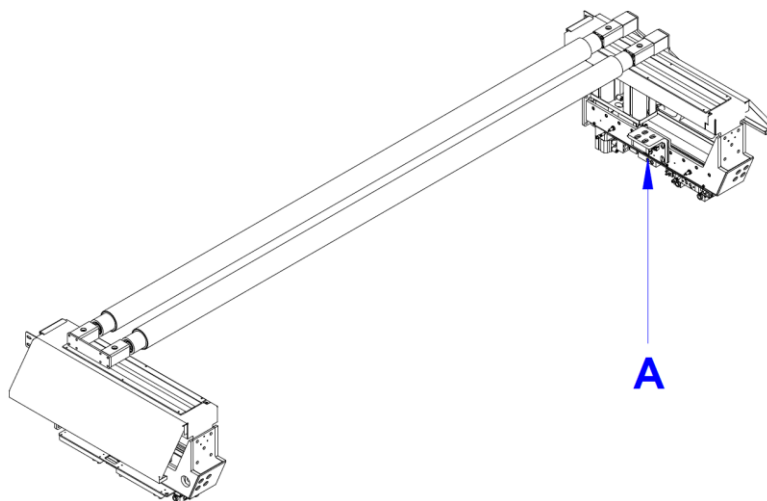
14.11. Loading pallet lubrication

1. Fill the pump provided with **Paraliq GA 3400** lubricant.
2. Insert the pump in the greasing nipples **A** and pump in one gram of lubricant (roughly one stroke of the pump).



14.12. Roller presser support lubrication

1. Fill the pump provided with **KLUBER Paraliq GA 3400** type lubricant.
2. Insert the pump into any one of the greasing nipples on the roller presser support and pump in approximately 3 grams of lubricant (4 strokes of the pump).
3. Repeat this operation for each of the greasing nipples on the roller presser support.



14.13. Interventions on the operating section

The following paragraph lists the scheduled maintenance operations for the operating section parts.

- Checking the electrospindle tool locking.
- Checking and cleaning the collet spindles.
- Checking and cleaning the electrospindle.
- Checking the connections of the electrospindles.
- Cleaning the C-axis.
- Lubricating the HSK F63 electrospindle unlocking device.
- Lubrication and cleaning of the boring spindle gears.

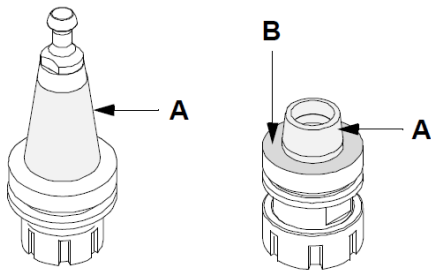
Checking the electrospindle tool locking

To carry out this check, fit a tool on each of the electrospindles present and, after stopping the machine, check manually to ensure they are perfectly locked. Also check that air is coming out of the electrospindle coupling area.

Checking and cleaning the collet spindles

Before using the collet spindles, make sure that the conical coupling **A** is thoroughly clean, without dust, grease, coolant, oil, metallic particles, scale, or traces of oxidising substances.

Carefully clean the conical coupling **A** and the stop surface **B** with a clean and soft cloth. It is forbidden to use aggressive products like acids or similar products, and abrasive elements like wire wool, wire brushes, emery cloth, etc.



For safety reasons, in order to guarantee accurate machining operations and to minimise collet spindle wear, keep these areas as clean as possible.



At the end of the day or a considerable machining operation, to avoid sticking problems, remove the collet spindle from the electrospindle and replace it with a clean one at room temperature. Warning! Wear gloves to avoid burns.

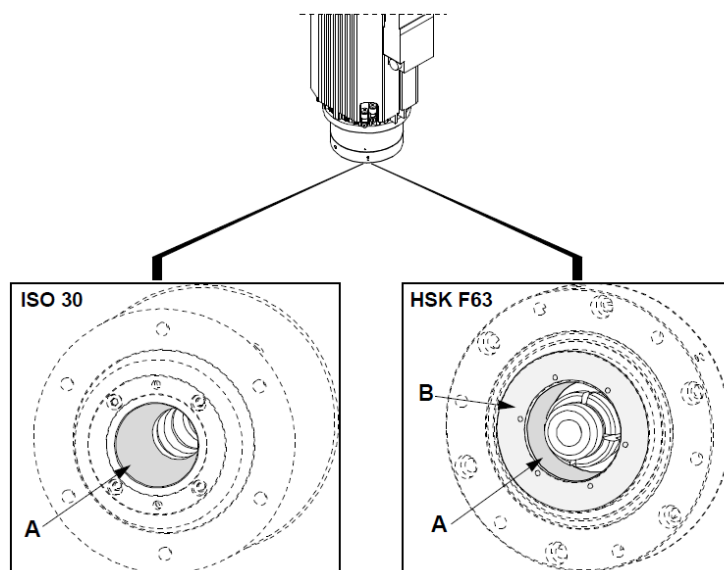


At the end of the machining operation, to avoid problems of sticking, always remove the collet spindle from the electrospindle and replace it with a clean one at room temperature. Warning! Wear gloves to prevent burns.

Checking and cleaning the electrospindle

Before using the collet spindle, make sure that the conical surfaces **A** and the stop surfaces **B** are thoroughly clean, without dust, grease, coolant, oil, metallic particles, scale, or traces of oxidising substances.

Clean the surfaces **A** and **B** carefully with a soft, clean cloth. It is forbidden to use aggressive products like acids or similar products, and abrasive elements like wire wool, wire brushes, emery cloth, etc.



For safety reasons, in order to guarantee accurate machining operations and to minimise electrospindle wear, keep these areas as clean as possible.



The electrospindle may be damaged if any dirt gets into the coupling area. If, therefore, you want to use compressed air to clean the outer surface of the electrospindle, protect this area with a plug or a clean collet spindle.



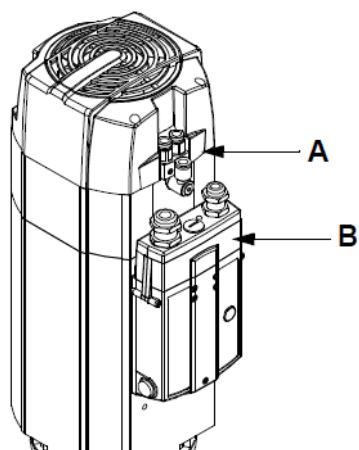
Do not direct jets of compressed air into the shaft of the electrospindle without the collect spindle fitted.



Checking the connections of the electrospindles

Inspect the following:

- Check the electrical cables are not damaged.
- Check that the connectors are firmly fixed (see the figure).
- Check the seal of the pipes of the pneumatic system and the cooling circuit connections.



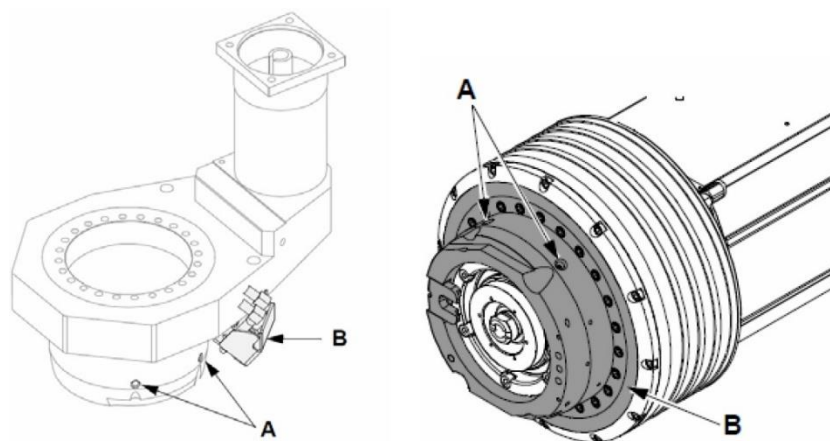
A Pneumatic connections.

B Electrical connections.

Cleaning the C-axis

Thoroughly clean the seats **A** every day. Before using the C-axis, make sure that the conical surfaces **B** are properly clean, without dust, grease, coolant, oil, metallic particles, limestone, and signs of oxidising substances.

Clean both the **A** and **B** surfaces carefully with a soft, clean cloth or brush to allow its correct functioning.



Lubricating the HSK F63 electrospindle unlocking device

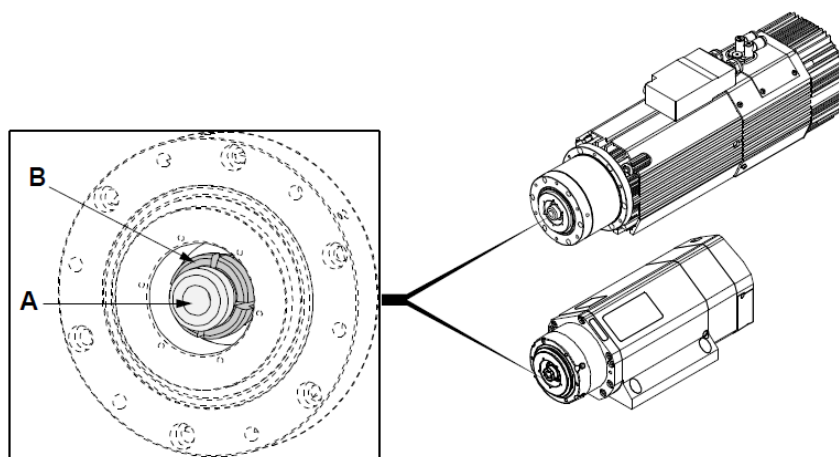
To avoid problems during tool changing operations, periodically [apply METAFLUX Fett-Paste 70-8508](#) grease for metals on the electrospindle unlocking device.



Use only the above-mentioned grease. Other products are not compatible with the ones used by manufacturer, at first greasing. If different types of incompatible greases are mixed or subsequently used, they can cause deposits of substances detrimental to the unlocking device operation, thus impairing safety.

Observe the following procedure:

1. Apply grease in the expeller **A** and in the gap between the locking collet segments **B**, with the help of a thin clean plastic implement.
2. Spread the grease evenly, using a collet spindle which should be inserted in the unlocking device and disconnected a dozen times.
3. Remove the collet spindle and wipe off any excess grease with a clean cloth.



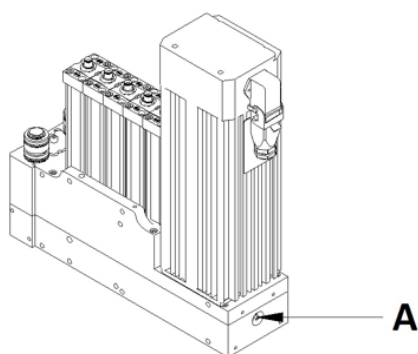
Excess grease is harmful since chips or other material may form deposits, which in turn may dirty the locking collet, the conical surfaces and the stop surfaces. For safety reasons, in order to guarantee accurate machining operations and to minimise wear of the unlocking device and the collet spindle, keep these areas as clean as possible.

Lubrication and cleaning of the boring spindle gears

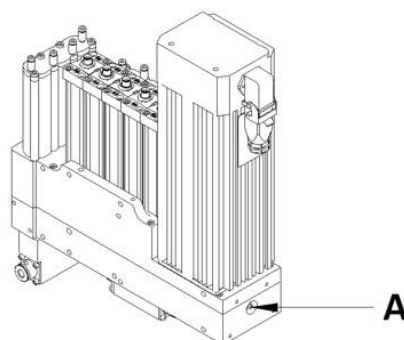
To lubricate the boring spindle gears, proceed as follows:

1. Fill the pump provided with the type of lubricant that is quoted in the plate of the boring unit.
2. Insert the pump in the greasing nipple **A** and pump in 5 grams of lubricant (approximately 5 strokes of the pump) in to each one.

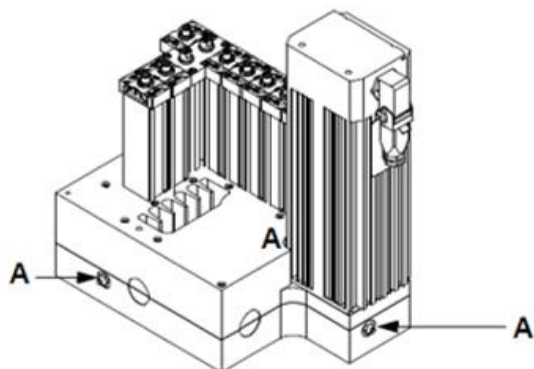
BH 5



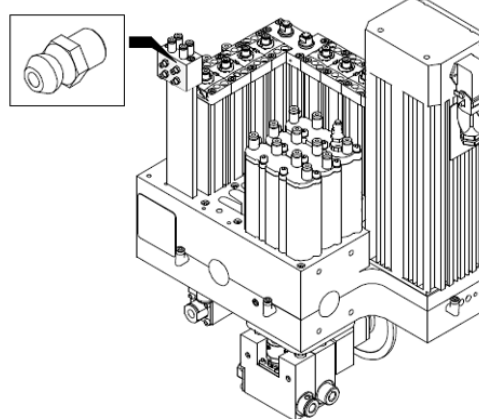
BH 9



BH 10



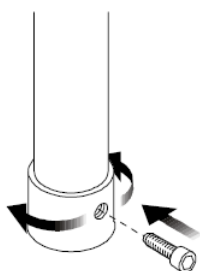
BH 17



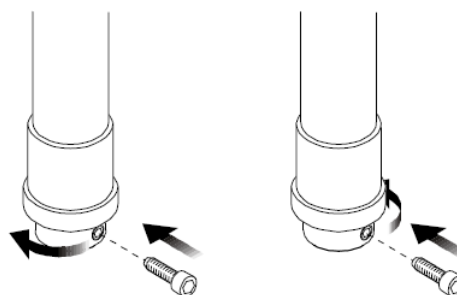
To keep the boring unit in good condition in the event of long periods of non-use, perform a general lubrication every 4 months.

3. At the end of the manual lubrication operation described above, manually rotate the spindles to distribute the lubricant evenly. To carry out this operation, proceed as follows:
 - Lower a spindle (preferably one that is not fitted with a tool). For the boring unit with snap-on coupling spindles it is necessary to lower 2 spindles, one right and one left.
 - Insert the screw into the tool fixing bore, so that it can be used to turn the spindles easily.
 - Turn the spindles, turning 5 times in one direction and 5 in the opposite direction.

standard spindle



spindles with snap-on coupling



4. Spindles not frequently used can become rusty and go down with difficulty or get blocked. After lubricating the boring unit it is therefore advisable to clean the outside of rusty spindles and apply a Teflon spray.

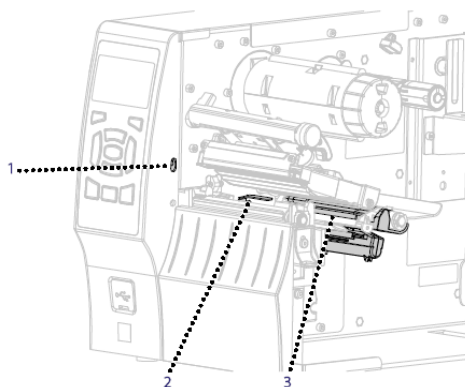
14.14. Labelling unit interventions

The following paragraph lists the scheduled maintenance operations for the labelling unit.

Cleaning the sensors

Proceed as follows to clean the sensors:

1. Using a brush or compressed air, remove paper residues and dust accumulated on the section of the supports and belt.
2. Using a brush or compressed air, remove paper residues and dust accumulated on the sensors.

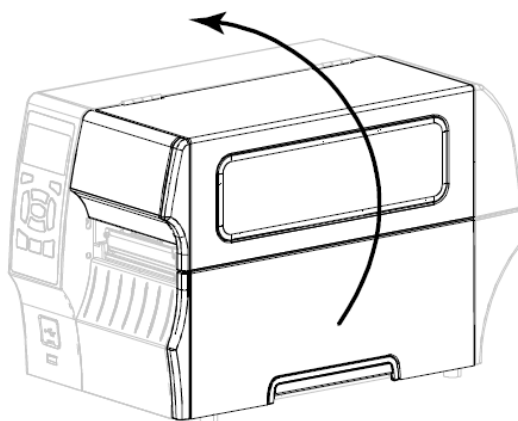


1	Label collection sensor
2	Belt sensor reflector
3	Support sensor

Cleaning the print head and roller

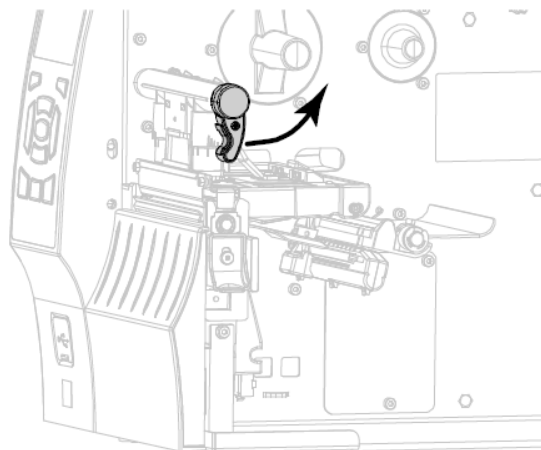
Proceed as follows to clean the print head and roller:

1. Lift the printer's door.



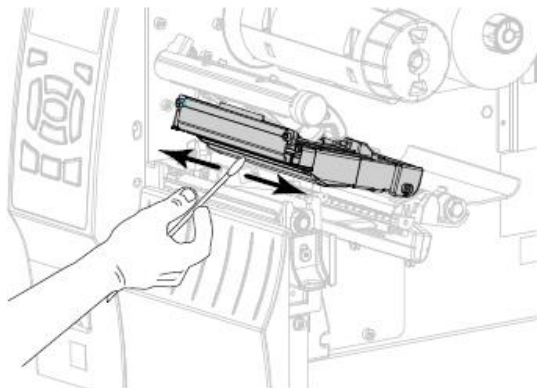
The print head may be very hot and cause serious burns. Wait for the head to cool down.

2. Open the head unit by turning the relative opening lever.

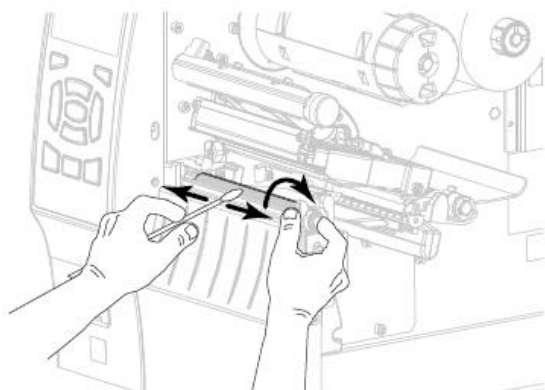


3. Remove the belt and supports.

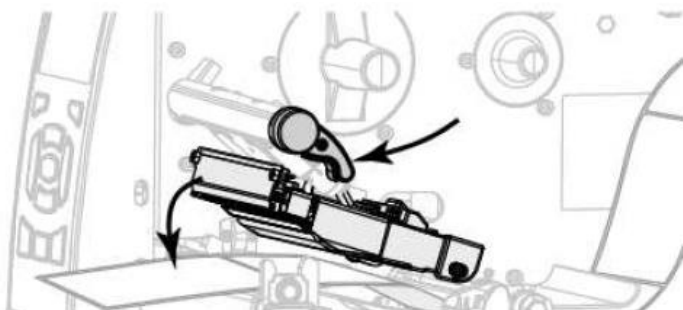
4. Using a clean cotton bud moistened with isopropyl alcohol, wipe the brown strip on the print head unit from one end to the other. Wait for the solvent to evaporate.



5. Manually turn the roller and simultaneously clean it with a cotton bud. Wait for the solvent to evaporate.



6. Reassemble the belt and supports.
7. Turn the opening level of the print head downwards until the head locks into position.

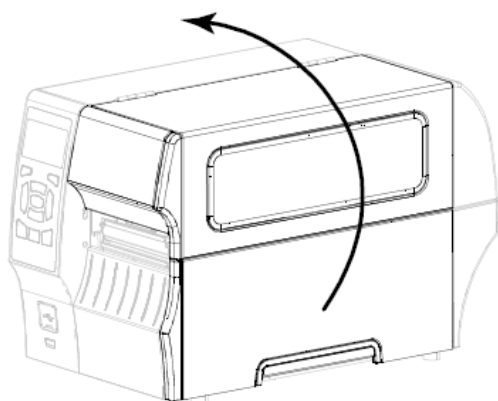


8. Close the door.

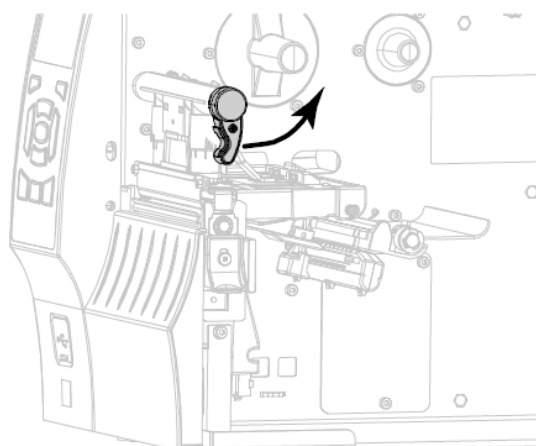
Cleaning the film peeler unit

To clean the film peeler unit, proceed as follows:

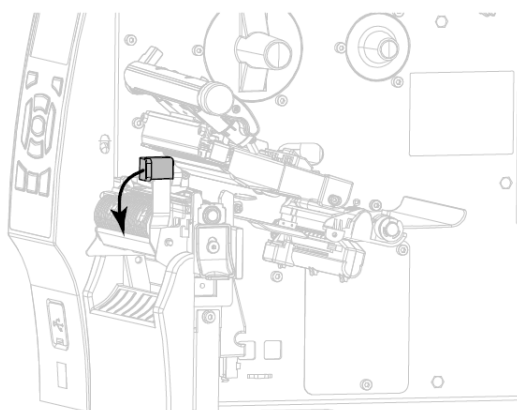
1. Lift the printer's door.



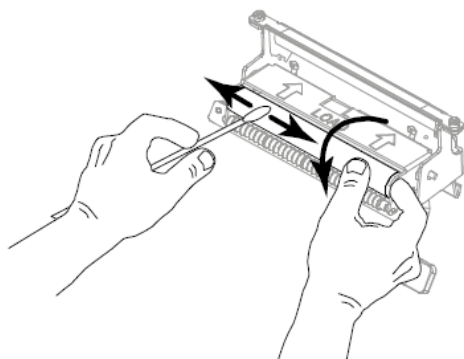
2. Open the head unit by turning the relative opening lever.



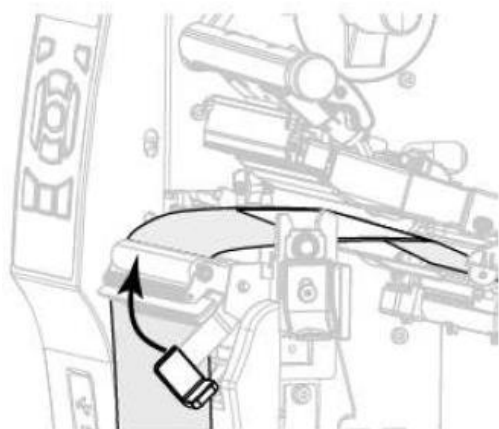
3. Press the film peeler unit's release lever mechanism downwards to open the film peeler unit.



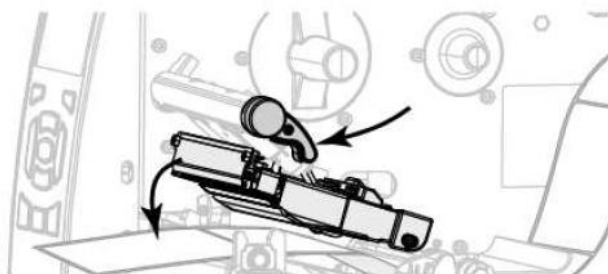
4. Remove any label support film in order to extract the grip cylinder.
5. While manually turning the grip cylinder, clean it with a clean cotton bud moistened with isopropyl alcohol. Wait for the solvent to evaporate.



6. Use a cotton bud to remove excess adhesive from the film peeler bar. Wait for the solvent to evaporate.
7. Reassemble the support film into the film peeler mechanism.
8. Close the film peeler unit from the release lever mechanism of the film peeler unit



9. Turn the opening level of the print head downwards until the head locks into position.



10. Close the door.

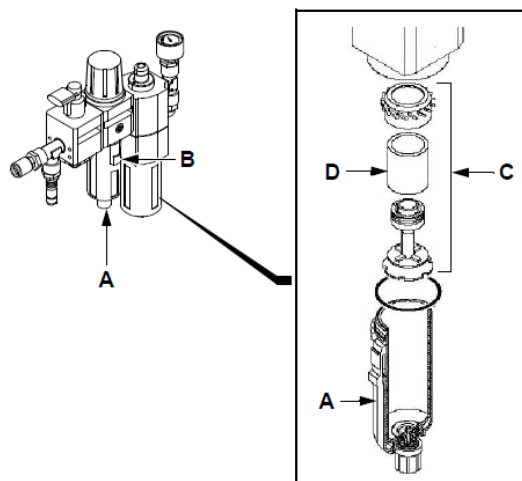
14.15. Interventions on the FR unit

The following paragraph lists the scheduled maintenance operations for the FR unit.

Cleaning the filter

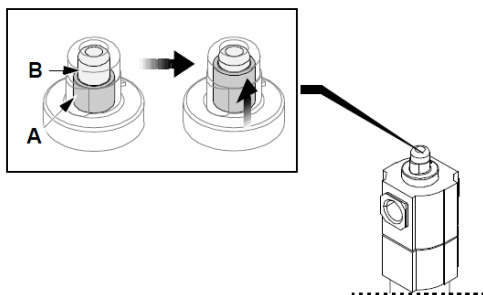
To clean the filter, proceed as follows:

1. Make sure there is no pressure in the system; the supply pressure gauge must indicate **0 bar**.
2. Remove the filter cup **A**. To do this, lower the lever **B** and turn the cup by 45° (either to the right or the left).
3. Unscrew the baffle unit (ref. **C**).
4. Take out the cartridge **D** and clean it with soap, water and compressed air.



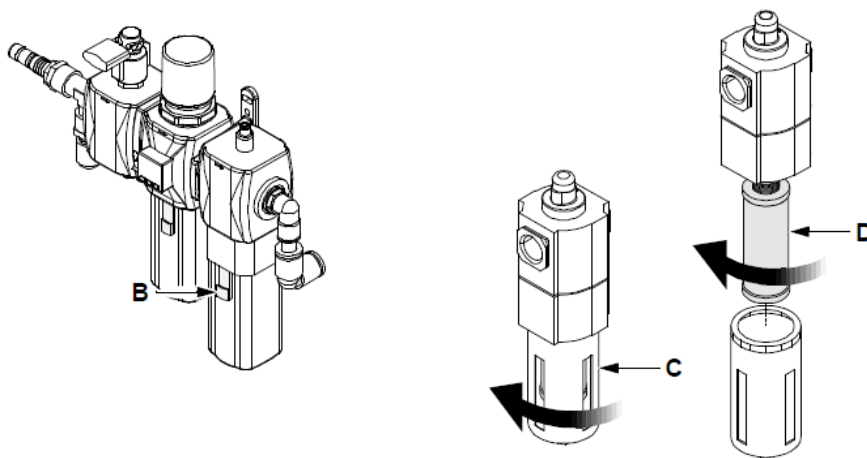
Replacing the oil separator filter cartridge

The oil separator filter cartridge should be replaced when the red indicator light **A** rises, arriving halfway up the green indicator light **B**.



To change the cartridge, proceed as follows:

- Make sure there is no pressure in the system; the supply pressure gauge must indicate 0 bar.
- Remove the cup **C** to do this, lower the lever **B** and then turn the cup by 45° to the left.
- Loosen the cartridge **D** and replace it.



14.16. Interventions on the electrical cabinet

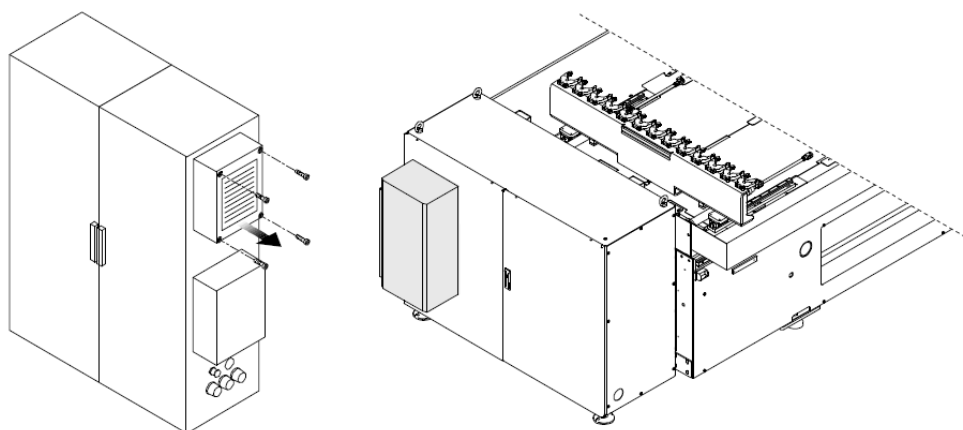
The following paragraph lists the scheduled maintenance operations for the electrical cabinet parts.

Cleaning the air conditioner

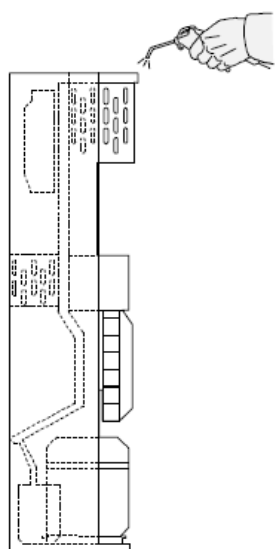
1. Turn the machine off.
2. Unfasten screws **A** and extract the casing.



When you take out the casing, pay attention to the internal connections.



3. Blow downwards with a jet of compressed air (not exceeding 4 bar).



4. Replace the casing.

14.17. Interventions on the Busch Mink vacuum pump

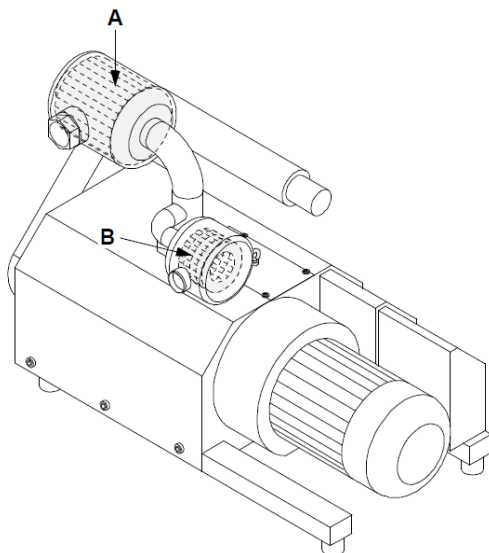
The following paragraph lists the maintenance interventions scheduled for both the **250 m³/h**, **290 m³/h** and **300 m³/h Mink-type Busch vacuum pump**. Before carrying out maintenance operations, switch off the vacuum pump.

Cleaning the net filter

Check the net filter and clean it (see the instructions supplied with the vacuum pump).

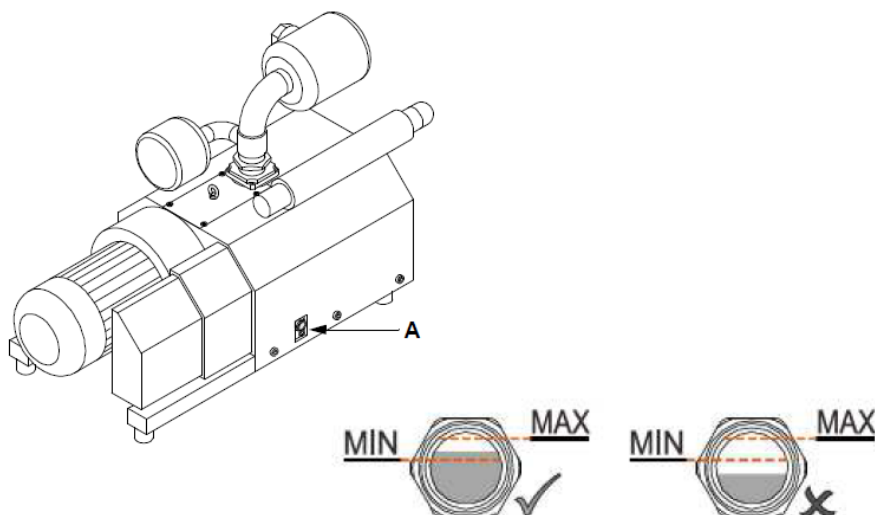
Cleaning and replacing the air filters

Remove the air filters **A/B** and clean them by blowing compressed air from the inside to the outside; if the filters are clogged, replace them.



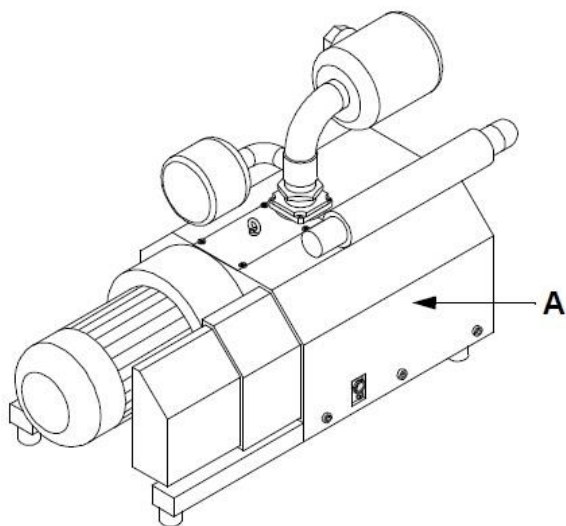
Checking the oil level

The oil level in the gear box can be checked with the indicator **A**. If the oil level is below the minimum notch, this means there is a leakage. Contact the Service Centre.



Cleaning the fans and the cooling tubes

1. Remove the soundproof casing **A**.

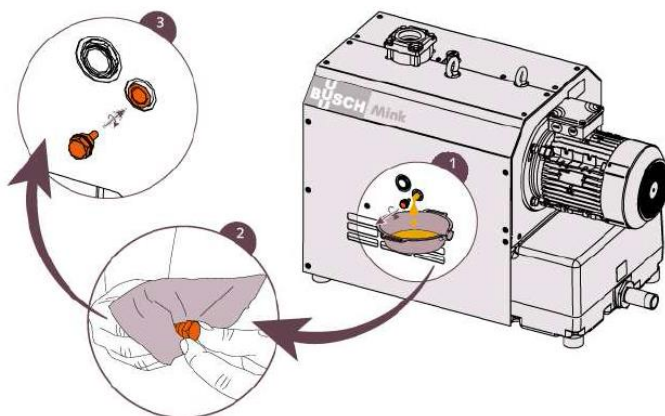


2. Clean the fans, cooling tubes, grills and cooling louvres (see the instructions supplied with the vacuum pump).
3. Replace the soundproof casing.

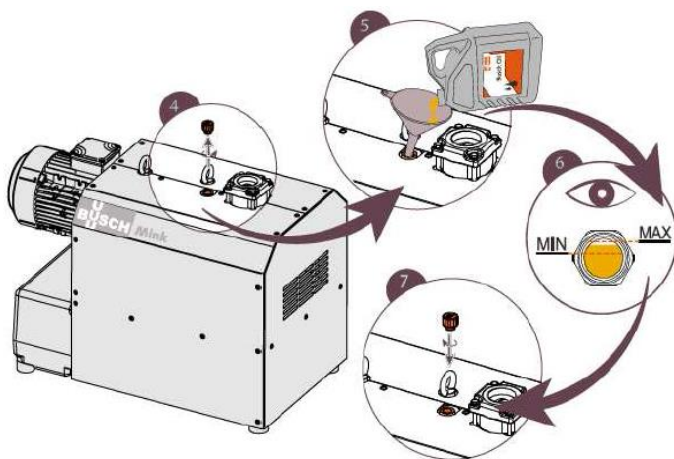
Replacing the oil

The oil must be changed when the pump has been turned off and the compressed air has been discharged.

1. Remove the cap from the discharge outlet and drain the old oil.
2. Clean the cap.
3. Screw the lid back on.



4. Remove the cap from the filling inlet.



5. Top up oil in the relative filling inlet.
6. Check the oil level.
7. Screw the lid back on.



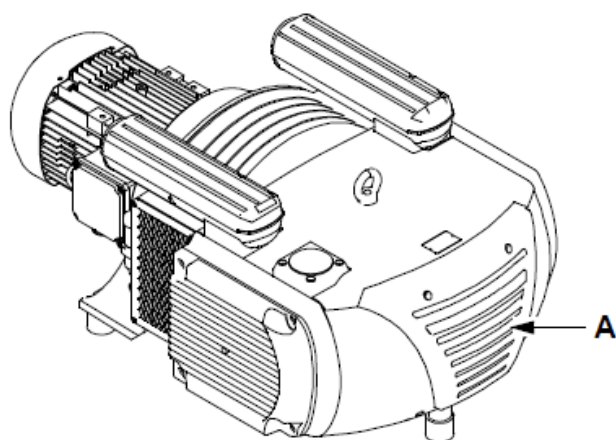
Use original Busch oils for vacuum pumps.

14.18. Operations on the Becker VTLF2.250 vacuum pump

The following section lists the maintenance operations planned for the **250m³/h Becker VTLF2.250 vacuum pump**.

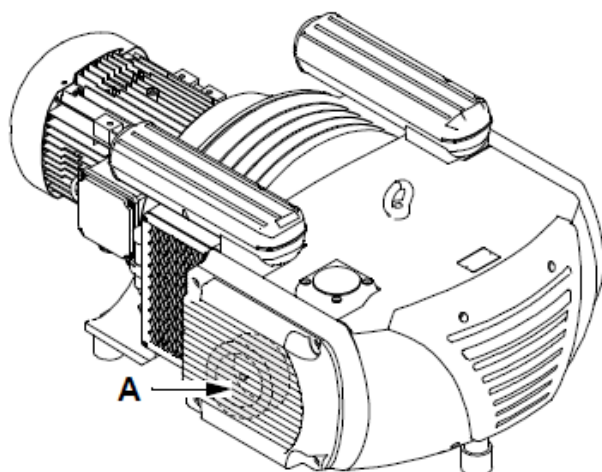
Cleaning the cooling channels

To guarantee adequate ventilation, clean the cooling ducts **A** by blowing with compressed air.



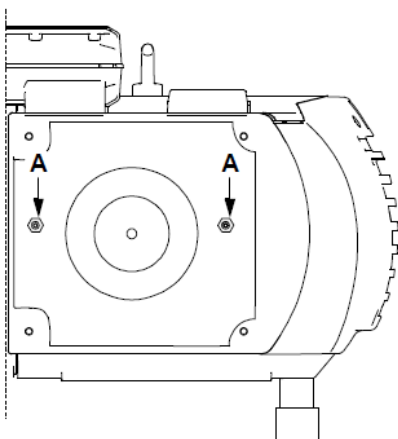
Cleaning the filters

Remove the air filters **A** and clean them using a jet of compressed air and blowing from the inside out. Replace blocked or greasy filters.



Lubricating the bearings

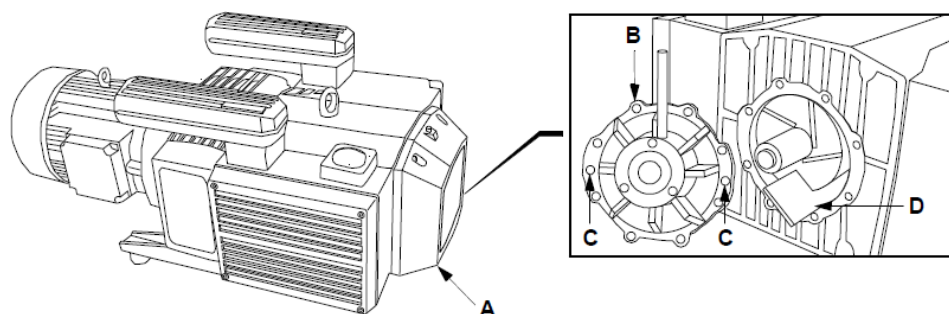
The vacuum pump bearings must be lubricated through the greasing nipples **A** with the pump operating, using the syringe provided filled with **KLÜBER AMBLYGON TA 15/2** type grease (pump in 10 grams of grease).



Blade wear check

Make sure everything is kept as clean as possible during this operation.

1. Remove the cover **A**.
2. Remove the cover **B**. To carry out this operation, after unscrewing the bolts that fasten the cover, screw two bolts evenly into the holes **C**, making sure the cover is not tilted to the side.
3. Remove the blades **D** and check they do not exceed the minimum limit of 41mm. If necessary, replace them. Make sure you assemble the blades the right way round.
4. When performing this operation, also check the gaskets and bearing for wear.
5. Replace the cover **B**, centring it perfectly on the rotor and on the pins, and screwing up the relative fixing bolts evenly. On completing the operation, check the rotor turns easily.
6. Replace the cover **A**.



14.19. Interventions to the Becker U 5.301/U 5.101 vacuum pump

The following paragraph lists the maintenance interventions scheduled for the 250/300 m³/h U 5.301 Becker and the 100 m³/h U 5.101 Becker pumps.

Before carrying out maintenance operations, switch off the vacuum pump.

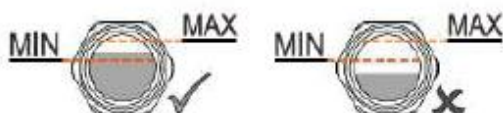
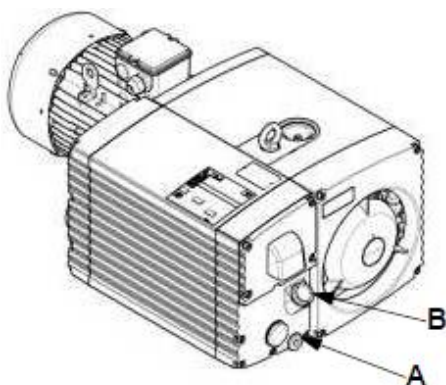
Checking the oil level and topping-up with oil

The oil level, in the pump tank, can be checked with the indicator **A**. If the oil level drops below the minimum level, top the oil up.

To fill the pump tank, it is recommended that you use DIN 51506 standard VC type oil, or original BECKER LUBE S 100 oils.

Observe the following procedure:

1. Remove the plug **B**.
2. Fill the tank up. The oil level must not exceed the maximum filling level (refer to the top filling line, next to the oil indicator). The tank has a capacity of 7 L.
3. Close the plug **B**.



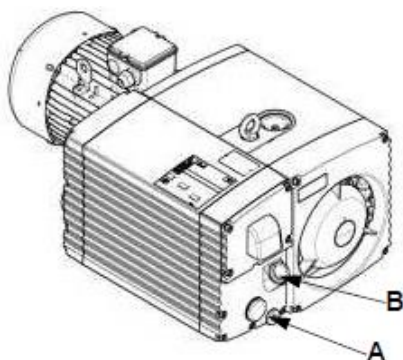
Replacing the oil, the oil filter and the coarse oil separator filter



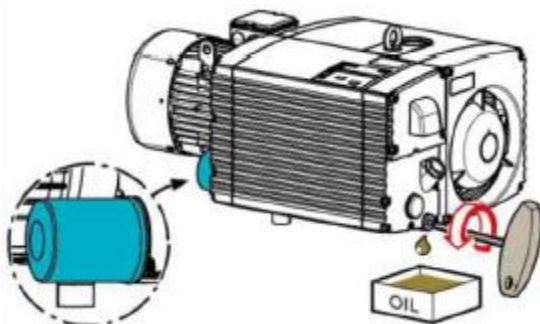
It is advisable to replace the oil for the first time after the first 500 hours of operation.

The oil must be changed when the pump is warm, after it has been turned off and the compressed air has been discharged.

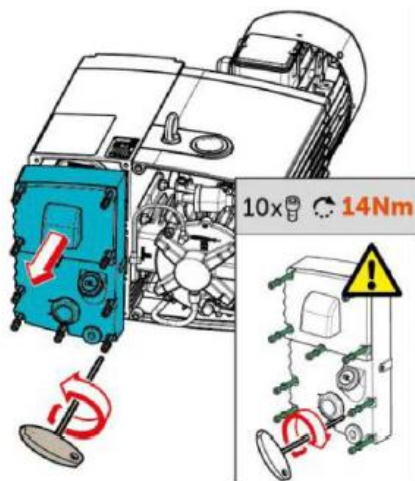
1. Place a container below the plug of the drain hole **A**.
2. Remove the plug **B**.
3. Remove the plug **A**, drain out the waste oil by tilting the pump and then close the drain bore with the plug.



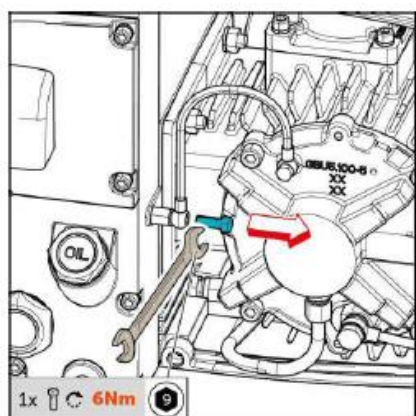
4. Remove the oil filter and replace it with a new one.



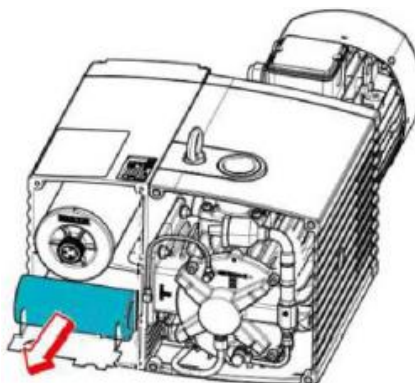
5. To replace the coarse oil filter, undo all the 10 screws and remove the cover.



6. To remove the cover, remove the oil tube. For that purpose, loosen and remove the spherical screw.



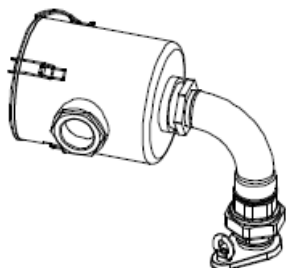
7. Replace the coarse filter.



8. Top up as described in [“Checking the oil level and topping-up with oil”](#).

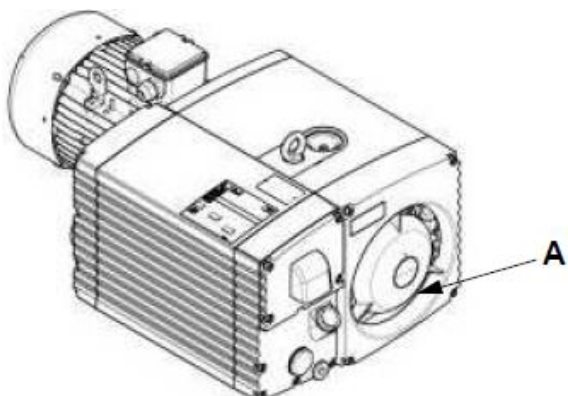
Cleaning and replacing the air filter

Remove the air filter and clean it with compressed air from the inside out. If it is obstructed or greasy, replace it.



Checking and cleaning the fan

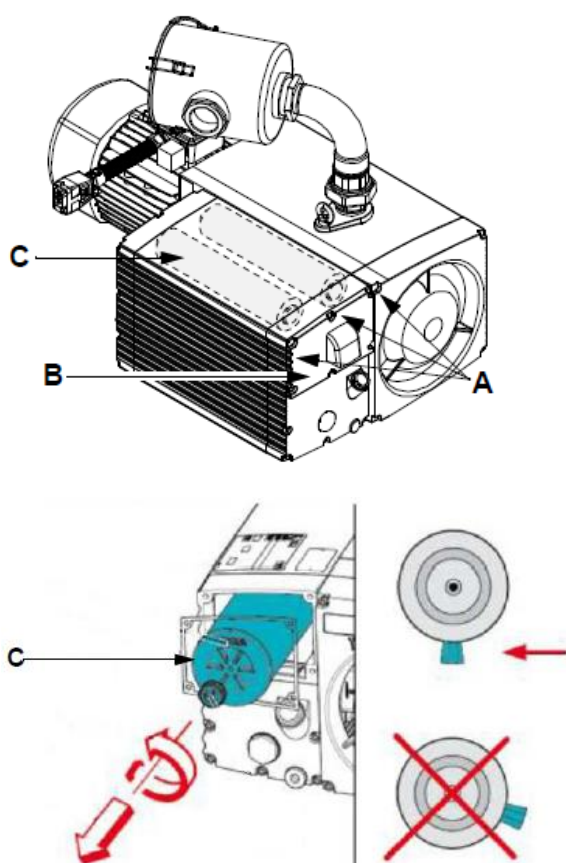
Keep the fan cover **A** clean to avoid the risk of blocked air passages compromising proper ventilation, resulting in the pump overheating.



Cleaning the oil separator filters

To replace the oil separator filters, follow the procedure below:

1. Turn the screws **A** and remove the cover **B**, the rubber gasket and any nuts and washers.
2. Loosen the devices blocking the filters **C**.
3. Replace the filters **C**.



14.20. Interventions on the Busch vacuum pump

The following section lists the maintenance operations planned for the **300m³/h Busch series R5 RA 0305 D vacuum pump**.

Before carrying out maintenance operations, switch off the vacuum pump.

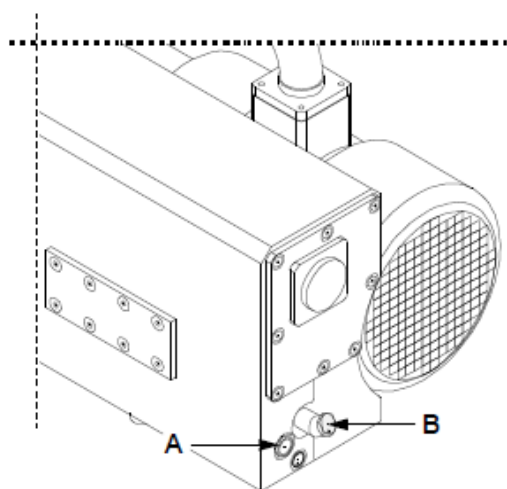
Checking the oil level and topping-up with oil

The oil level in the pump tank can be checked with the indicator **A**. If the oil level drops below the minimum level, new lubricant must be added.

To fill up the pump tank, it is recommended that you use DIN 51506 standard VC type oil, or original Busch (E.g., Oil VHM 100).

Observe the following procedure:

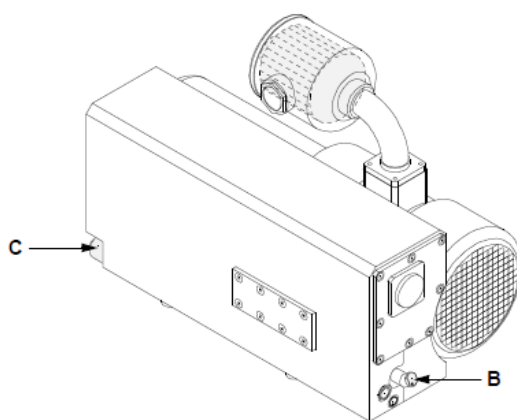
1. Remove the plug **B**.
2. Fill the tank until the oil level reaches the maximum level marker. The tank has a capacity of 6.5 l.
3. Seal the bore with the plug.
4. Start the pump and run it for approximately one minute, checking that the oil level is correct.



Replacing the oil and the oil filter

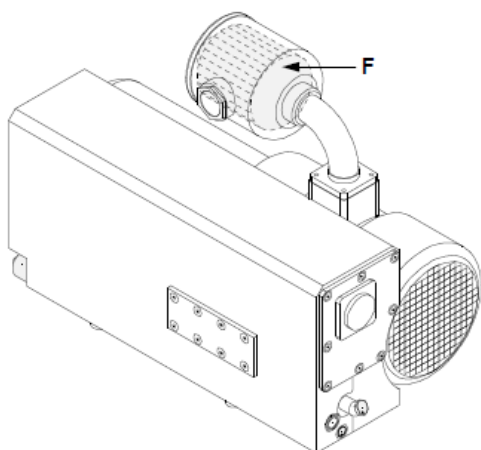
The oil must be changed when the pump is warm, after it has been turned off and the compressed air has been discharged.

1. Remove the plug **B** from the drain bore, drain out the old oil, tilting the pump and then close the drain bore again with the plug **B**.
2. Start the pump and run it for a few minutes, then unscrew plug **B** again to drain off any remaining oil. At the end of the operation, screw the plug on again.
3. Remove oil filter **C** and replace it with a new one.
4. Top up as described in [“Checking the oil level and topping-up with oil”](#).



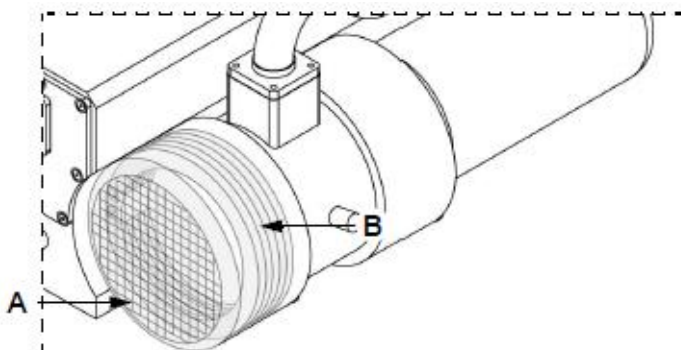
Cleaning the air filter

Remove the air filter **F** and clean it with a jet of compressed air, blowing from the inside towards the outside; if the filter is clogged or greasy, change it.



Checking and cleaning the fan

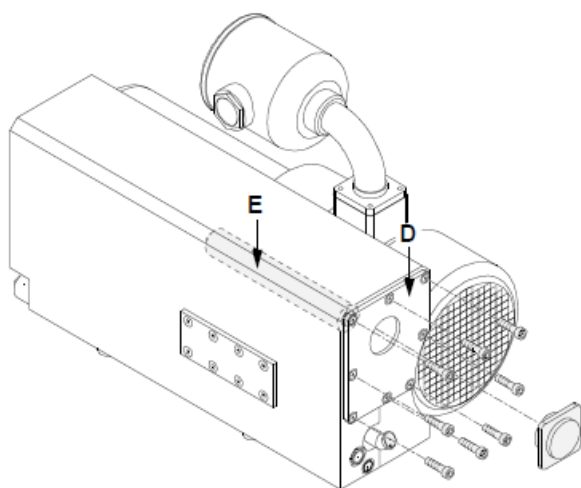
Keep the fan cover **A** and the radiator **B** clean, to avoid the risk of blocked air passages affecting proper ventilation, resulting in the pump overheating.



Replacement of the oil separator filter

To replace the oil separator filter, proceed as follows:

1. Turn the screws and remove the cover **D**, the rubber gasket, the grid and any nuts and washers.
2. Replace the filter **E**.



14.21. Comparative lubricant table

Below, there is a list of recommended lubricants which may be used instead of those indicated.

Lubricant	Brand	Type
Grease	KLUBER	Paraliq GA 3400
	LUBCON	THERMOPLEX ALN 1001/00
	CASTROL	OPTILEB GR UF 00
	FUCHS	CASSIDA GREASE RLS 00



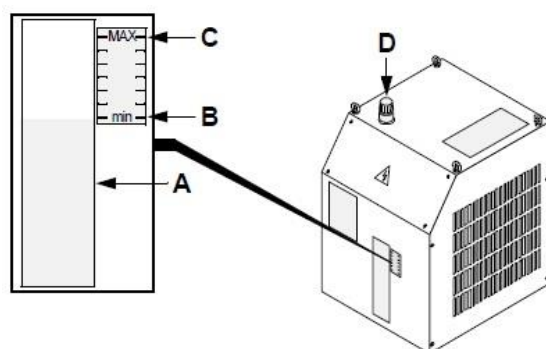
Do not mix different types of lubricant: they might be incompatible.

14.22. Interventions on the refrigerator

The following paragraph lists the scheduled maintenance operations for the refrigerator.

Checking and topping up the coolant

Indicator **A** allows to check that the level of the coolant is not too low, that is not too old or contains traces of rust, metallic particles or scale. If the coolant is below the minimum notch (**B**), remove the plug **D** and fill the tank until you reach the maximum notch (**C**).



To avoid damaging the cooler, use the coolant known as Artic-Flu-5 (made up of demineralised water with 10% glycol and anti-corrosion additives). Alternatively, you can use a mixture of demineralised water with 10% ethylene glycol and anti-corrosion additives, or an equivalent product.

Cooling characteristics

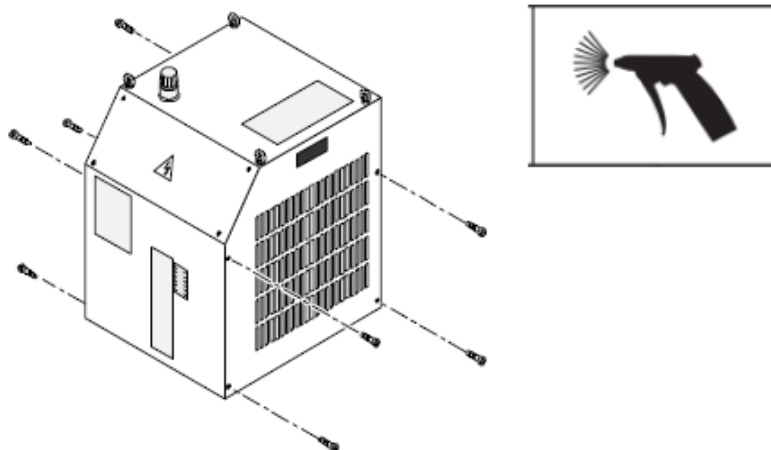
- Input cooling temperature: $t = 20^{\circ}\text{C} - 30^{\circ}\text{C}$.
- Anti-corrosion means: $V_{\text{max}} = 25 \text{ Vol\%}$.
- Solid materials filter $< 100 \mu\text{m}$.

Type of water additives

Brand	Type
ARAL	SAROL 340 - $2 \div 3\%$
CINCINNATI	CINCINNATI CIMCOOL MG 602 - 4%
HENKEL	P3 - PREVOX 6710 - $2 \div 3 \%$
CASTROL	SYNTILO R PLUS - $2 \div 3 \%$

Cleaning the cooler

1. Make sure the refrigerator is turned off and disconnect the relative electricity cable.
2. Remove the casing from the refrigerator after loosening the screws that hold it in place.
3. Clean with compressed air.
4. Replace the casing.



Changing the coolant



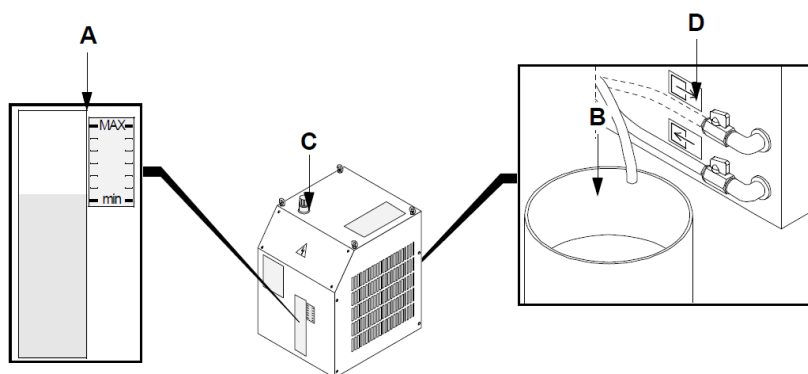
To avoid damaging the refrigerator, be careful not to let dirt fall into the tank.

1. Make sure that the refrigerator is turned off and disconnect the relevant cable from the power supply.
2. Using the indicator **A**, check the level of the coolant in the tank is above the minimum notch.

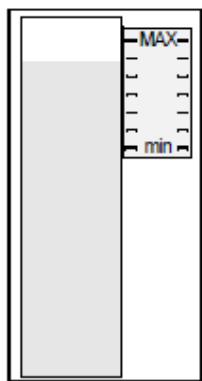


Never allow the fluid in the tank to drop below the minimum level; danger of breaking the pump

3. Take a container **B** to collect the liquid to be replaced.
4. Remove the plug **C**.
5. Disconnect the pipe **D** from the coolant inlet tap and put it into the container **B**.



6. Connect the power supply cable, turn the refrigerator on and make sure the coolant circulation pump is working.
7. Gradually fill the refrigerator tank with water as the level of the coolant drops. Finish the operation only when clean water is coming out of the pipe inserted into the container.
8. Turn the refrigerator off and disconnect the cable from the power supply.
9. Connect up pipe **D** to the tap again, and continue to fill the tank; the fluid level must not reach the maximum level mark, but must be just below it.



10. Pour the coolant into the tank (see [“Cooling characteristics” paragraph 14.20](#)).
11. Turn the refrigerator on again and make sure there are no leaks.

14.23. Heat exchanger maintenance operations

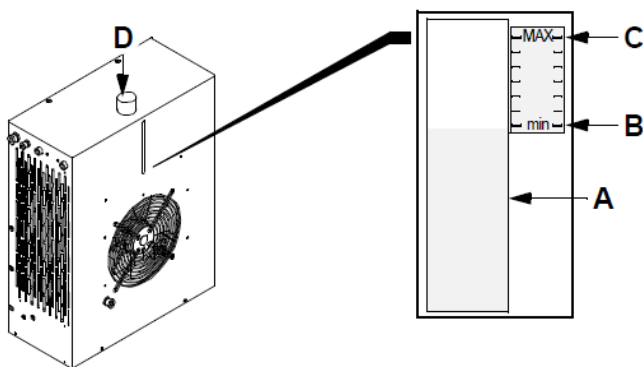
The following paragraph lists the scheduled maintenance operations for the heat exchanger.

Checking and topping up the coolant



To avoid damaging the heat exchanger, be careful not to let dirt fall into the tank.

Indicator **A** allows to check that the level of the coolant is not too low, that is not too old or contains traces of rust, metallic particles or scale. If the coolant is below the minimum notch (**B**), remove the cap **D** and fill the tank until you reach the maximum notch (**C**).



To avoid damaging the heat exchanger, use Artic-Flu-5 coolant (made up of demineralised water with 10% glycol and anti-corrosion additives). Alternatively, you can use a mixture of demineralised water with 10% ethylene glycol and anti-corrosion additives, or an equivalent product.

Cooling characteristics

- Input cooling temperature: $t = 20^{\circ}\text{C} - 30^{\circ}\text{C}$.
- Anti-corrosion means: $V_{\text{max}} = 25 \text{ Vol}\%$.
- Solid materials filter $< 100 \mu\text{m}$.

Types of demineralised water additives

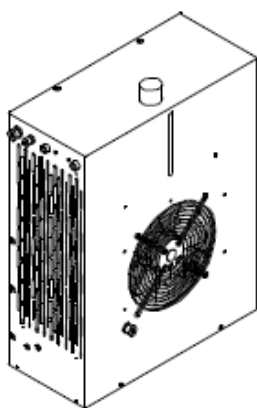
Brand	Type
ARAL	SAROL 340 - 2 ÷ 3%
CINCINNATI	CINCINNATI CIMCOOL MG 602 - 4 %
HENKEL	P3 - PREVOX 6710 - 2 ÷ 3 %
CASTROL	SYNTILO R PLUS - 2 ÷ 3 %

Cleaning the heat exchanger

1. Make sure the heat exchanger is turned off and disconnect the relative electricity cable.
2. Clean with compressed air.



In order for the heat exchanger to work properly, be careful not to damage the aluminium blades.



Changing the coolant



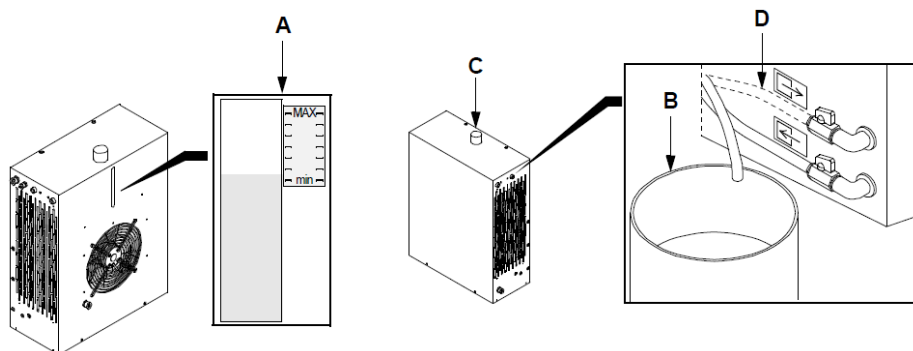
To avoid damaging the heat exchanger, be careful not to let dirt fall into the tank.

1. Make sure the heat exchanger is turned off and disconnect the relative electricity cable.
2. Using the indicator **A**, check the level of the coolant in the tank is above the minimum notch.

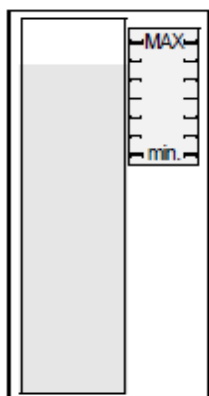


Never allow the fluid in the tank to drop below the minimum level; danger of breaking the pump.

3. Take a container **B** to collect the liquid to be replaced.
4. Remove the plug **C**.
5. Disconnect the pipe **D** from the coolant inlet tap and put it in the container **B**.



6. Connect the power supply cable, turn the heat exchanger on and make sure the coolant circulation pump is working.
7. Gradually fill the refrigerator tank with demineralised water as the level of the liquid drops. Finish the operation only when clean water is coming out of the pipe inserted into the container.
8. Turn the heat exchanger off and disconnect the cable from the power supply.
9. Connect the pipe **D** to the tap again, and continue to fill the tank; the fluid level must not reach the maximum level mark (it must remain below this notch).



10. Pour the coolant into the tank (see [“Cooling characteristics” paragraph 14.21](#)).
11. Turn the heat exchanger on again and make sure there are no leaks.

15. Technical characteristics

15.1. Main machine axes X, Y, and Z

	X	Y	Z
maximum programmed speed (m/min)	25**	60	25
acceleration programmed (m/s ²)	3.5	4	4

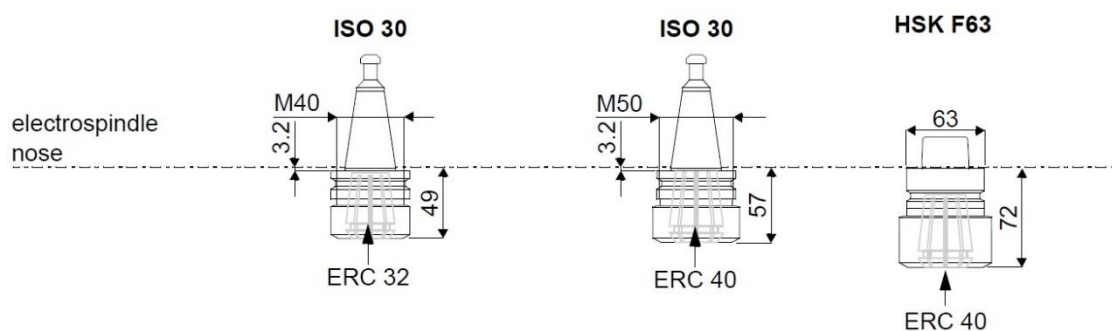
(** 60 m/min with express pack).

15.2. Types of electrospindles

	maximum power (service type S6) at 12000 rpm	Maximum rotation speed (rpm)
ES959 - ISO 30 (air-cooled)	13.2kW	24000
ES959 - HSK F63 (air-cooled)	13.2kW	24000
ES959 - HSK F63 (liquid-cooled)	19.2kW	24000

15.3. Collet spindles

	ISO 30		HSK F63
Type of collet	ERC 32	ERC 40	ERC 40
maximum rotation speed (rpm)	24000	24000	24000



- The geometry of the taper must comply with standard DIN69871 for ISO30 cones, and standard DIN69893 for HSK cones.
- The ISO30 tool holder cone must have an AT3 degree of accuracy.
- Avoid the presence of plugs, slots or other forms that could disturb the dynamic balance of the collet spindle.
- At the maximum rated speed of the electrospindle, the dynamic balance must be $G = 2.5$ or higher.
- The balance is obtained with the collet spindle assembled.
- The screw dowel of the ISO30 cone must be supplied by the manufacturer only.

15.4. Boring unit

	BH 5	BH 9	BH 10	BH 17
Engine power at 6000 rpm (KW)	1.7	1.7	1.7	1.7
maximum spindle rotation speed for circular blade (rpm)	7500	7500	7500	7500
Rotation speed of vertical spindles (rpm)	6000	6000	6000	6000
Rotation speed of horizontal spindles (rpm)	-	6000	-	6000
distance between spindle centres (mm)	32*	32*	32*	32*

* The value indicated is only reached after a proper warm-up.

A Spindle with standard coupling.

B Spindle with snap-on coupling.

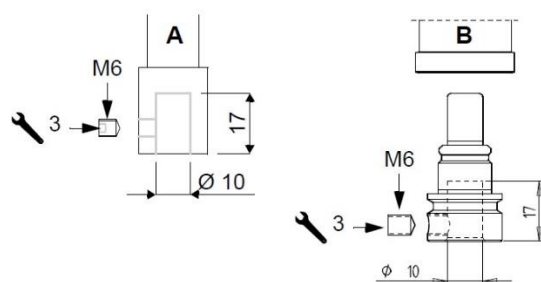
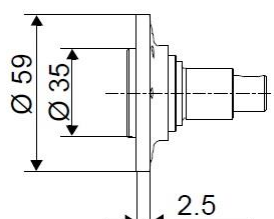


Figura 2



15.5. C-axis

S6 torque (Nm).	38
S6 power (kW).	0.39
Rated frequency (Hz).	40
Rated speed (rpm).	100
Max. Frequency (Hz).	40
Max. Speed (Hz).	100
Rotation speed during interpolation (rpm).	60
Acceleration (revs/sec ²).	10

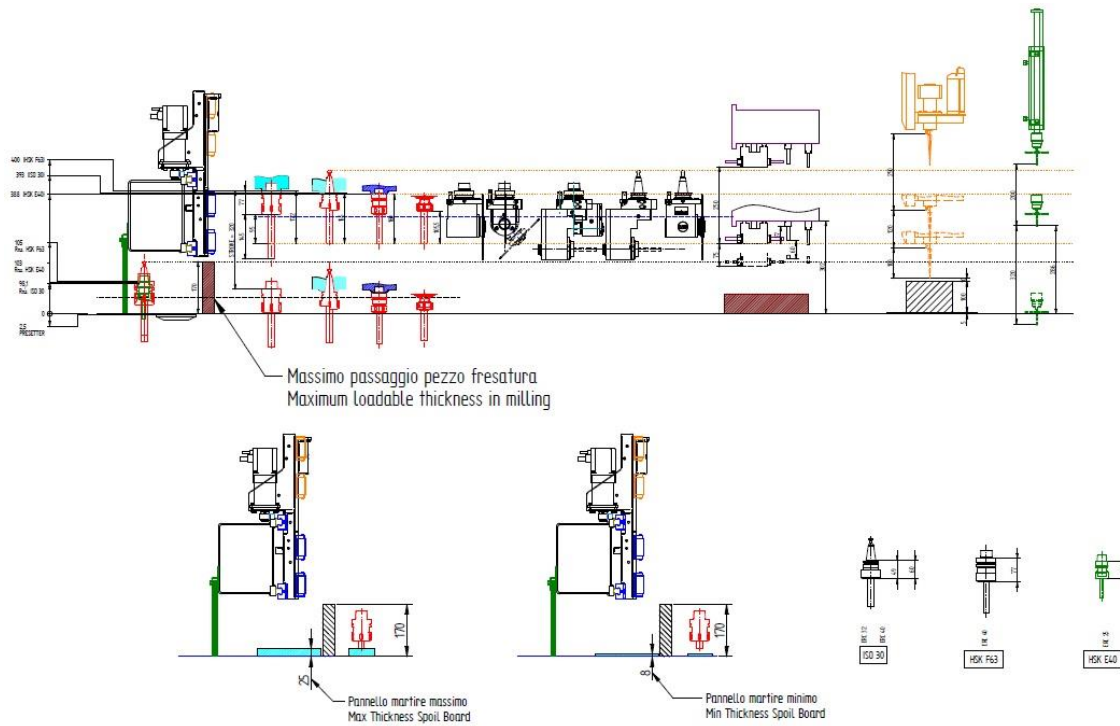
15.6. Dimensions of the shapeable suction cups

- Shapeable suction cup size 132 x 54 x 29mm.
- Shapeable suction cup size 132 x 75 x 29mm.
- Shapeable suction cup size 132 x 146 x 29mm.
- Shapeable suction cup size 132 x 146 x 29mm, with device to help loading.
- Shapeable suction cup size 315 x 315 x 29mm.

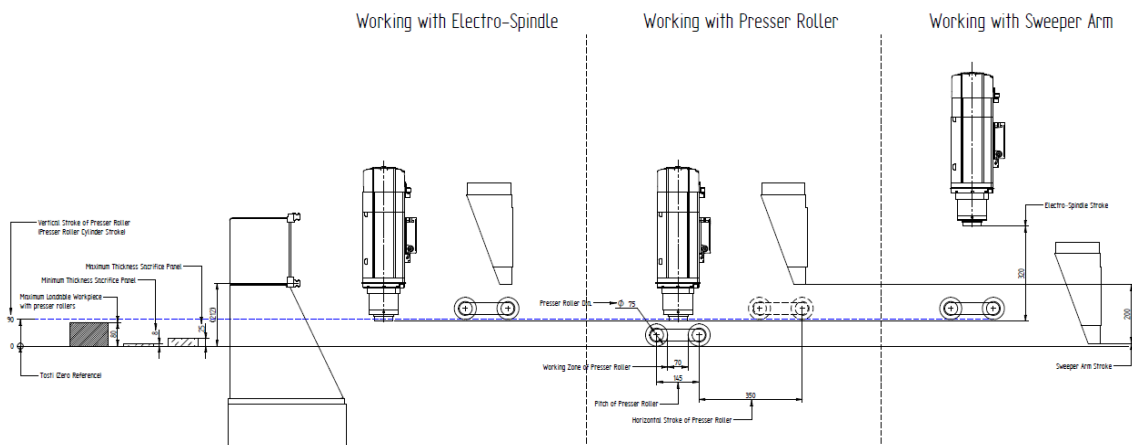
Shapeable suction cups that can be used on the spoilboard

- Shapeable suction cup size 132 x 54 x 33mm.
- Shapeable suction cup size 132 x 75 x 33mm.
- Shapeable suction cup size 132 x 146 x 33mm.

15.8. Layout to adjust tools stroke



15.9. Layout to adjust presser roller



15.10. Working field in X-Y

The technical characteristics of the working field in **X-Y** of each machine are indicated in the layouts supplied with the machine (**See layouts manual**).

15.11. Working field in Z

The technical characteristics of the working field in **Z** of each machine are indicated in the layouts supplied with the machine (**See layouts manual**).

15.12. Noise level

The sound pressure levels detected from the operator station are shown in the table below.

The values indicated may vary according to certain parameters:

- Nature and size of the piece.
- The type of tools used.

Weighted sound pressure level A in:

Operator workstation L _{pfA}	76 dB (A)
Loading unloading position L _{pfA}	72 dB (A)

Operating conditions: Boring or Milling at a speed of **20 m/min, 20000 rpm**.

LWA = 93.5 dB	during boring
LWA = 95.5 dB	during milling
Uncertainty factor	K = 4 dB
Reference standards	EN ISO 3746 - EN ISO 11202



The noise levels indicated are output levels and do not necessarily represent safe operational levels.

Even though there is a relation between emission levels and exposure levels, this cannot be used reliably to establish whether further precautions are necessary.

The factors determining the noise levels to which the operative personnel are exposed include the length of exposure, the characteristics of the work area, as well as other sources of dust and noise, etc. (i.e. the number of machines and processes concurrently operating in the vicinity). In any case, the information supplied will help the user of the machine to better assess the danger and risks involved.

16. Transport

The machine can be dispatched using various forms of transport (road, rail, sea, air), and the method is usually agreed with the customer at the time of purchase. The machine is divided into a number of parts for transport purposes, and this appendix contains a list of the parts to be dispatched, and their relative weights.

16.1. Notices on lifting and unloading the machine

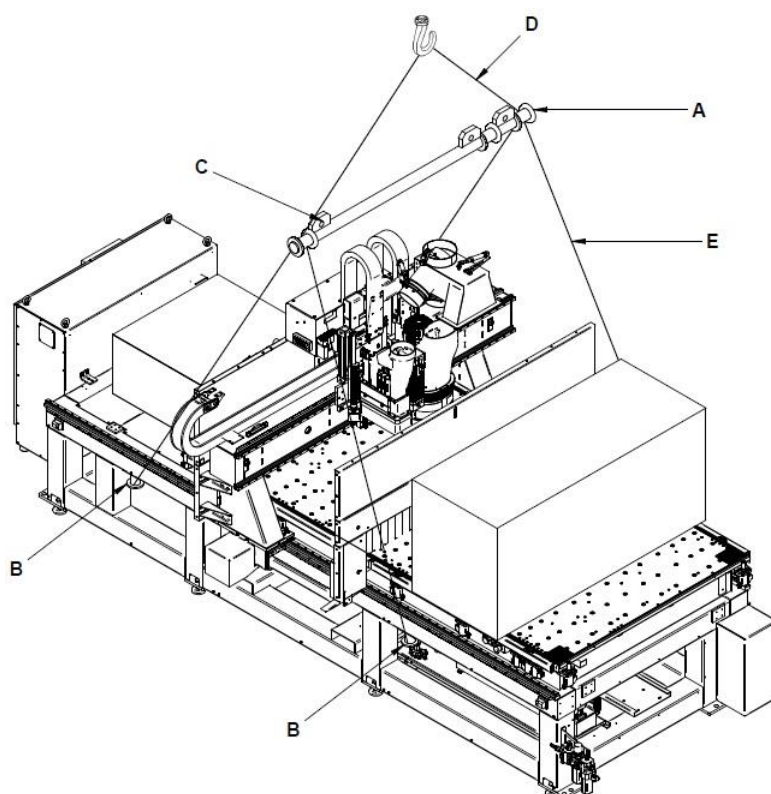
Before lifting and transporting the machine, read the following notices carefully:

- The lifting and transporting operations must be carried out by suitably qualified personnel who shall follow the indications given below.
- Use equipment of a suitable load-bearing capacity to perform lifting operations. The gross weight is shown on every package.
- Do not use a forklift to lift the machine.
- Check that the lifting materials are in good condition. During lifting and movement make sure that there are no unauthorized persons within the range of action of the machine.
- Before lifting the machine, check the position of the load's centre of gravity and avoid any sudden, dangerous swings that could damage the load itself and check the machine's weight on its identification plate. Make sure that flat straps are spread out to their proper length.
- On completing positioning of the machine the lifting devices must be removed and kept for possible future movements.

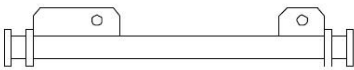
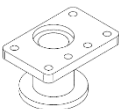
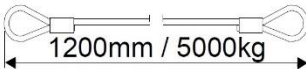
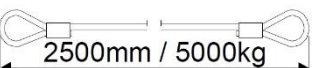
After unloading the main structure, remove the boards and vibration damper plates located under the base ("see paragraph [Removal of the boards and vibration damper plates](#)").

16.2. Lifting the machine

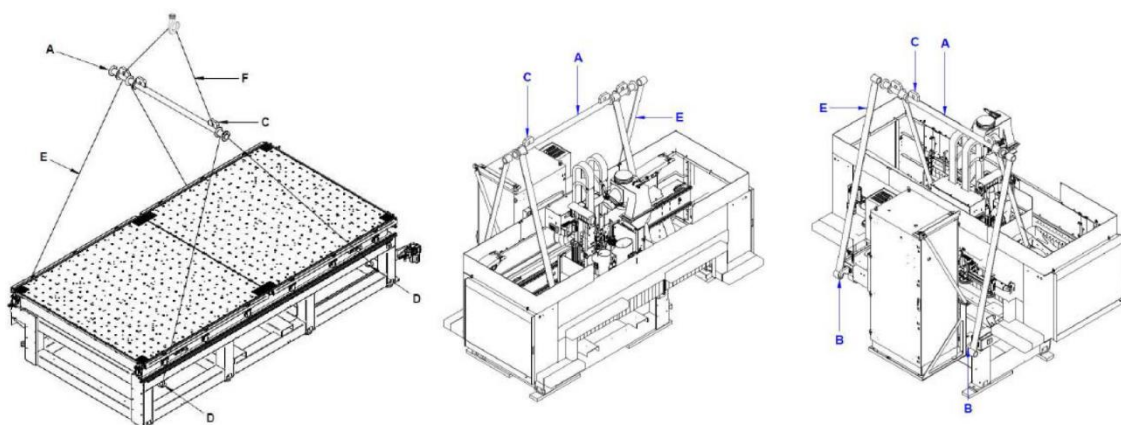
To lift the main structure of the machine use the method illustrated below. No particular procedures are necessary to lift the remaining parts.

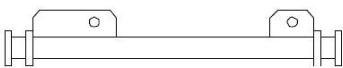
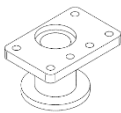
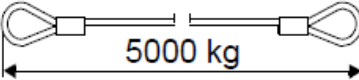


Rover K FT 1224, 1236, 1531, 1536, 1836.

Material	Quantity	Supplied
A 	1	Yes
B 	4	Yes
C 	2	No
D 	2	No
E 	4	Yes

Rover K FT 2231, 2243

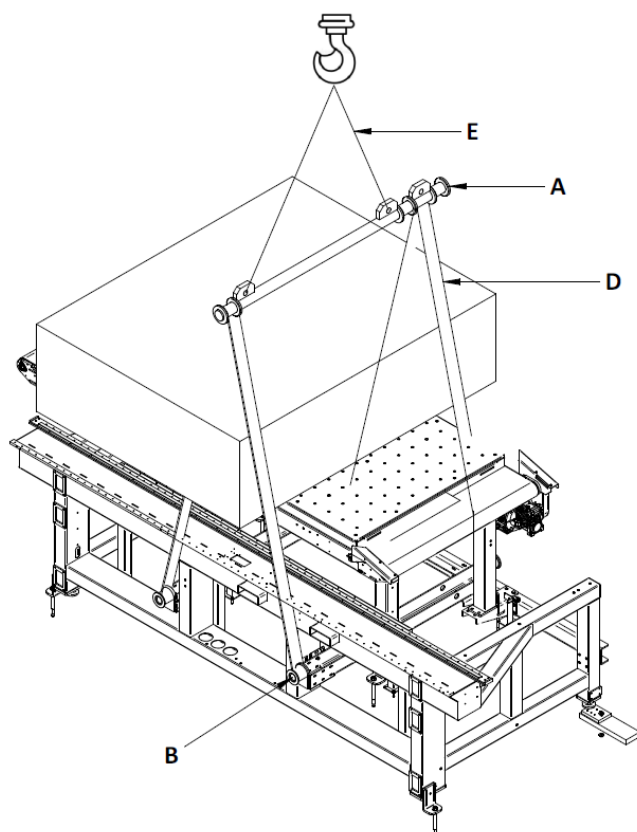


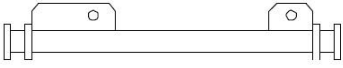
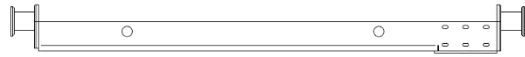
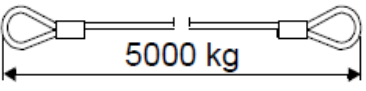
Material	Quantity	Supplied
A 	1	Yes
B 	4	Yes
C 	2	No
D 	4	Yes
E 	4	Yes
F 	2	No



The equipment supplied must not to use for other machines or other purposes.

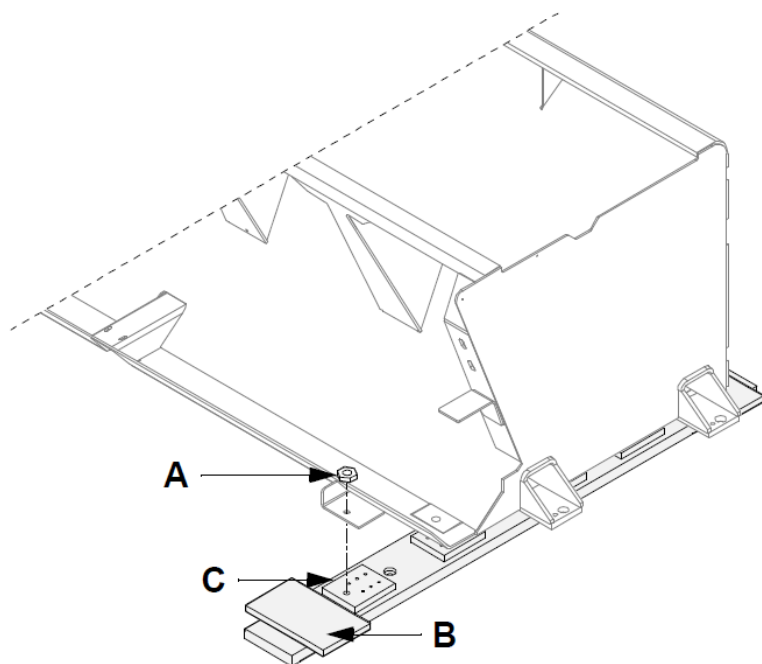
Loading pallet and unloading belt lifting



Material	Quantity	Supplied
A 	1	Yes
B 	2	Yes
C 	2	No
D 	4	Yes
E 	2	No

Removal of the boards and vibration damper plates

Before resting the main structure on the ground, unscrew all the screws **A** and remove the wooden boards **B** and the vibration damper plates **C** from under the base.



While unloading the machine by crane or forklift, lower the machine levelling pads to half of its screw length before placing on the ground.

17. Installation

This appendix contains indications for the installation of the machine.

17.1. Warnings regarding machine installation

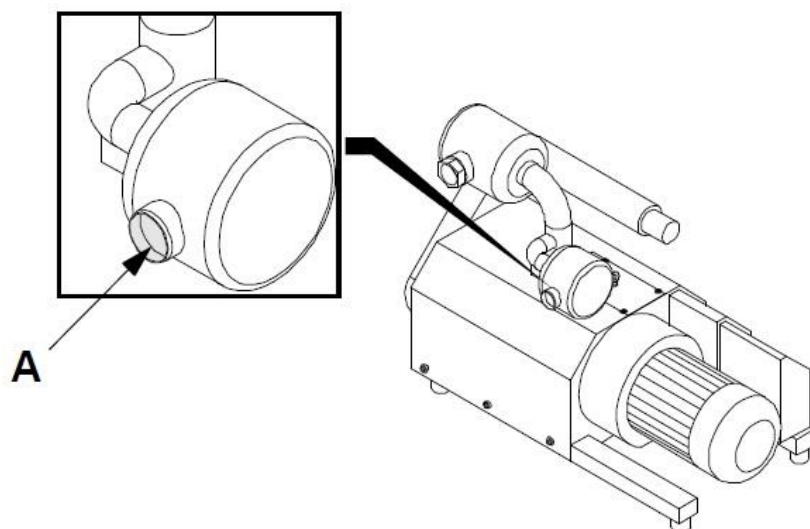
Before proceeding, please read the following warnings carefully:

The area in which the machine is installed must be properly illuminated, ventilated, of adequate size and fitted with connections to the various supply systems (electricity, compressed air, etc....). In this regard, refer to "Machine layout, connection points and working dimensions". The systems to which the machine is to be connected and the environment in which it is to be installed must comply with the requirements.

The machine cannot be installed in explosive environments.

Assembly levelling and connection of the machine must be carried out exclusively by the Service Centre staff. Do not remove the packing, open any cases of material, or above all turn the machine on without the consent of trained, experienced staff. Should the safety seals on the boxes of accessories be tampered with, manufacturer will not be liable for any missing objects.

Check the plug A of the Busch Mink pump air filter has been removed; if not, remove it immediately.

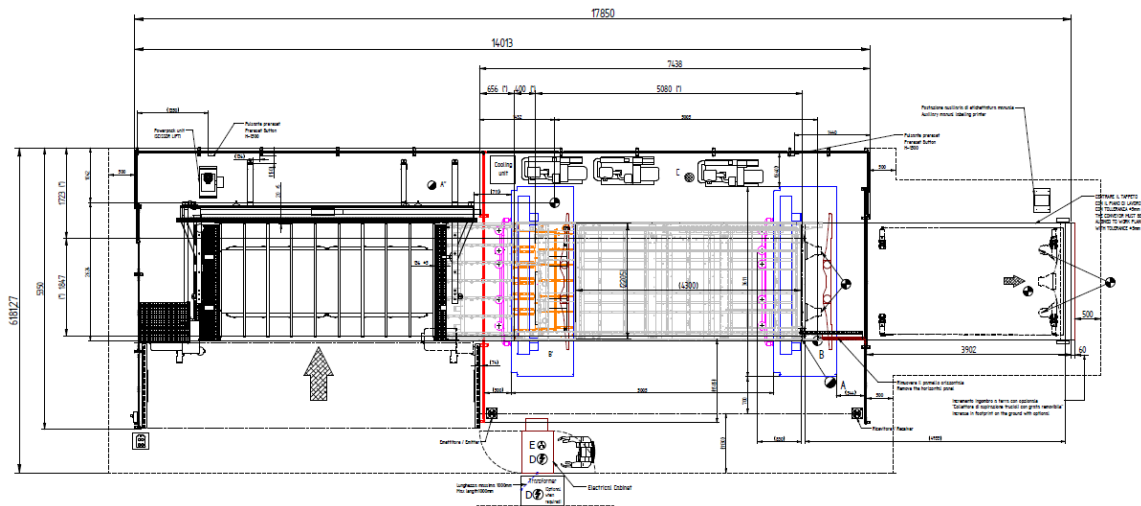


17.2. Machine layout, connection points and working dimensions

The machine layouts, supplied by the manufacturer, shows:

- Working dimensions.
- Connection points.
- Technical specifications.

Example of layout:



The connection points are as follows:

	Network connection outlet.
	Suction manifold.
	Electric power socket.
	Location of the vacuum pump.
	Compressed air system connection outlet.
	Port.
	Positions for the holes to anchor the machine to the floor.

The technical specifications are as follows:

Compressed air consumption	NI/min
Mains voltage	V - Hz
Power installed	kWatt - A
Suction air speed	m/sec
Suction air consumption	M3/h
Compressed air mains supply pressure	bar

17.3. Installation area requisites

The following describes the essential requisites both for the various systems to which the machine will be connected and for the environment in which it is to be installed.

Electric system requisites

The quality of the electric system must guarantee the essential requirements indicated in CEI 60204-1, IEC 204-1, unless otherwise agreed with the customer.

- Supply voltage: (see rating plate) with tolerance $\pm 10\%$.
- Supply voltage frequency: (see rating plate) with tolerance $\pm 2\%$.
- Maximum absorbed power: (see rating plate).
- Harmonic distortion: from second to fifth $< 10\%$ + from sixth to thirtieth $< 2\%$.
- Three-phase supply voltage imbalance: $< 2\%$.
- Voltage peaks: duration less than 1.5 ms and $< 200\%$ of supply voltage.
- Voltage gaps: duration < 3 ms; period > 1 second.
- Voltage drops: value $< 20\%$ of peak supply voltage; period > 1 second.
- System to comply with standards: IEC 64-8, IEC 364.

For mains voltages up to 400V, the machine's electrical cabinet can be connected to a point in the system with a short-circuit current of less than 10 KA R.M.S. (or 17 KA peak). For mains voltages greater than 415V the short circuit current at the connection point must be lower than 5 KA R.M.S.

If the presumed short circuit current at the power supply point is greater, it must be restricted.

The machine's electrical equipment is not protected against atmospheric power surges.

The machine is not fitted with phase advancing capacitors.

Differential protection

No differential type protection is foreseen for the machine's electric system. The choice of differential protection must not contrast with current legal requirements, local regulations, or the characteristics of the factory and machine electrical system.

Bear in mind the following machine characteristics to ensure you make the correct choice:

1. Electromagnetic disturbance limitation measures (mains filter and screening) may produce high frequency leakage currents and pulse leakage currents exceeding 30 mA. The 30 mA differential switches may not guarantee continuous operation under all conditions.
2. The machine may be subject to earth faults even with direct current (IEC 755). If this is not in contrast with local laws or the characteristics of the system, you are advised to fit differential switches with adjustable currents and trip times, of the type that are not influenced by high frequencies. It is advisable to use differential switches that are highly resistant to pulse overvoltage caused by atmospheric conditions and manoeuvres (EN 61008-1), and wave tested 8/20 μ s > 1000 A (VDE 0432 T2).

Power supply from local electricity generator

If the electricity is supplied by a local generator rather than mains supply, the generator must guarantee the above indicated requisites for the electrical system, while taking also into account that the starting current for the vacuum pumps is 8 to 10 times the machine's specification plate current.

Electrical data for the machine main supply connection

Refer to the **layout manual** supplied with the machine, for the machine's main supply connection electrical data.

Installed electrical power

The power output depends on the number and capacity of vacuum pumps as shown in the table. The minimum installed power indicated on the machine rating plate always comprises the power required for 2 vacuum pumps, 90m³/h (or one 250m³/h), even if they are not present in the machine. The power factor taken into account is 0.85.

Fuses

At the mains electricity connection point there must be safety protection in the form of fuses for the connection cable, for the cut-off switch and any autotransformer present. Uses GI/Gg type fuses for IEC regulations, or J type for UL and CSA (or equivalent) regulations.

The power supply cable, the electrical cabinet cut-out and any autotransformers can be protected by automatic switches. When selecting the type of automatic switch to be used, bear in mind the following conditions:

The automatic switch thermal current must be calibrated to the same value as that of the cut-out.

- The magnetic current must be set to between 7 and 12 times the rated thermal current.
- The automatic switch must have a cut-out power exceeding the short circuit current at the point of installation.
- The current limited by the switch must be less than 10 KA (5 KA for voltages >415V) with a short circuit current equal to that at the installation point (see the switch limiting characteristics).

Connection cable

The mains connection cable must have a cross-section chosen according to the size of fuses, or automatic switches, and the length of the connection itself. "The sections are shown in the layout supplied with the machine".

It is advisable for the cable to be shielded or fed through a metal conduit so as to reduce possible electromagnetic interference. The screening or metal raceway must be earthed.

Requisites for the compressed air system

- The compressed air system must guarantee a supply pressure of at least **7 bar**.
- The machine consumes an average of approximately 400 NL/min of compressed air.
- The compressed air admitted to the machine must satisfy the following cleanliness requirements:
 - Solids particles Class 7: Dimension < 40 micron; Concentration < 10mg/m³.
 - Maximum oil content: Class 3 (1 mg/m³).
 - Dew Point: Class 4 ($\leq + 30$ C).
 - Solid particles concentration per m³: Class 2.

0.1÷0.5µm	0.5÷1µm	1÷5µm
≤400.000	≤ 6.000	≤ 100

17.3.1. Network requirements

If the monitoring system is installed, the following network requisites are needed. The machine must be connected to the Internet. If it's connected to a LAN network, the network must be configured to allow an output connection (without passing through a proxy server) on the following ports:

- TCP 80 (http).
- TCP 443 (https).
- TCP 61716 (stomp SSL).
- TCP 61717 (stomp SSL).
- UDP 123 (NTP).

The same ports must also be activated on the Windows Firewall on the machines. The network output speed must be at least **1 Mb/sec**.

Suction system requisites

The Suction system must comply with the Standard UNI EN 12779.

- The suction system must be permanently connected to the machine, it must operate with the machine and must be capable of supplying a constant minimum flow rate of 28 m/sec.
- The static pressure in the point of connection to the operating section (main manifold) is 3000 Pa.
- The air consumption for aspiration is 4948 m³/h.
- A guillotine valve type device must be provided on the pipe connecting the suction system to the machine, so that the machine can be cut off when necessary from the main system. This valve must be in an easily accessible position and in full view of the operator.



Insufficient system performance may damage health.



Daily check that there are no leaks or malfunctions in the system.



Check the airflow speed after having installed the system and after each important modification.

Flooring requisites

The floor must be even, made of concrete, and must comply with the following requisites.

Compression resistance	30 N/mm
Maximum slope in any direction	0.5%
Maximum planar error, non cumulative	25 mm/m

Environmental requisites

- Temperature: from 0°C to +40°C.
- Maximum relative humidity: 80% (without condensation).
- Maximum altitude: 1000m (unless agreed otherwise with the customer).

18. Decommissioning – Demolition

18.1. Decommissioning

During the machine's life cycle it may be necessary to transfer it to another location. In this case, contact the Service Centre.

18.2. Demolition

When the machine reaches the end of its technical working life it must be totally decommissioned, so that it can no longer be used for the purposes for which it was designed and built. If any parts are used again it must be for purposes other than those for which the individual part and the machine as a whole was originally designed and constructed.

Contact specialised companies for demolition of the machine.



Certain parts of the machine might be under pressure. Fix all parts capable of moving by gravity.

The machine uses lubricating oil and grease. To neutralise the lubricant fluids which remain attached to parts of the machine and cannot be reused, use degradable solvents of an approved type. For evacuation of recoverable lubricant fluids empty the tanks and deliver the fluids to the local authority in charge of disposal. Any batteries, accumulators, buffer batteries for electronic cards and conditioners that may be found in the machine must also be disposed of in a suitable manner.

The manufacturer declines all liability for damage to persons or things that may derive from any secondary use of single parts of the machine for functions or assemblies other than those originally contemplated. The manufacturer recognises no implicit or explicit suitability for specific purposes of any parts of the machine which are used again after final decommissioning in view of demolition.

19. Guarantee and customer service

19.1. Warranty

For information about the warranty, please refer to the documentation issued on purchase of the machine.

19.2. Customer service

The service department employs technicians with a high level of knowledge and experience on the models manufactured, gained through special training in our factory, who are able to service machines on site.

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