APACHE 5

USE AND MAINTENANCE MANUAL
ORIGINAL VERSION IN ITALIAN
REVISION No. 00

CE

Summary

DEFINITIONS

MANUFACTURER

The legal entity having final liability:
- for machine construction,
- for machine conformity with applicable laws,
- for machine conformity with sales characteristics,
- for correct operation of the machine for the entire warranty period.

CUSTOMER

The legal entity with final liability for machine running and operators.

OPERATOR

By operator is meant the person with a determinate qualification who, following the customer's instructions, performs any operation on the machine.

MACHINE

A mechanical assembly which, on the basis of operating procedures and performances, performs certain operations on pieces, under the control of the operators.

GENERAL SAFETY RULES

DESCRIPTION OF ICONS

Important parts of this manual are indicated by the following icons:

 This symbol indicates important notes as regards machine operation.

 This symbol indicates important notes as regards operator safety.

USE AND MAINTENANCE MANUAL

The manual must be deemed an integral part of the machine and must be looked after and protected against all deterioration, until the machine is finally scrapped.
In the event of any part of it becoming spoilt or illegible, immediately ask the manufacturer for another copy.

 The manual must always be readily available for reference, near to the machine, in a place easily recognisable by operators.

 Before performing any jobs on the machine, operators must have carefully read all parts of the manual.
Before performing jobs, operators must become properly acquainted with the manual.
Operators must carefully comply with the information contained in the manual and with the rules governing safe machine use.

 Carrying out any jobs on the machine that are not contemplated in this manual or carrying out jobs in a way different to that described in this manual is forbidden.

 In case of any machine faults, or presumed machine faults that find no solution in the manual, the operator must immediately put the machine in safety condition and notify the manufacturer.

 § Hazard or fault situations – GENERAL SAFETY NORMS

 Placing the machine in safety condition § General rules – MAINTENANCE

 Failure to comply with any of the instructions in this manual and/or shown on the machine plates will increase the likelihood of accidents and exempt the manufacturer from all liability.

MODIFICATIONS

 Modifying the machine is strictly forbidden, especially the safety devices and guards.

IMPLEMENTATIONS

In the event of the customer having its own external systems operating in coordination with the machine, e.g., automatic piece loading and unloading systems, these must be disconnected from the machine, both electrically and mechanically, except whenever explicitly allowed and specified in this manual or by the manufacturer.
The customer must in any case accept liability for the entire assembly, machine and external systems, as regards risk analysis, design and execution, as required by applicable laws.

SAFETY IN THE WORK ENVIRONMENT

Work area

The machine work area must be:

- not exposed to weather conditions, clean and dry,
- suitable for withstanding expected loads,
- flat and level,
- not slippery,
- free of all obstacles that could prevent movement of operators, materials and handling mechanisms,
- suitably lit (at least 500 lux average maintained),
- delimitated, by means of barriers and/or notices, so as to prevent access to unauthorised persons or things.

Keep minors (under-18s) away from the machine work area, especially during operation.

Close to the machine, there must be no liquids, gas, powder concentrations, inflammable substances or potentially explosive atmospheres (absolutely no ATEX environments of any degree or type).

Noise

The sound pressure level of an environment does not only depend on machine emissions but is also affected by all the noise sources in the surrounding area and by the characteristics of the environment itself.
After starting up the machine, the customer is responsible for measuring such sound pressure level.
If such level exceeds acceptable limits, the customer shall take all measure required by law to reduce the risk of damaging operator health.

Prolonged exposure to sound pressure limits above acceptable ones can cause damage to the health. Suitable protection systems are therefore mandatory.

SAFETY NOTICES

At adequate machine positions, safety and indicator notices are located consisting of symbols and also descriptive texts reiterating and underscoring meaning.

The customer must make sure that all the notices on the machine are legible.

Removing safety notices or changing their characteristics is strictly forbidden.

The operators must carefully abide by the safety notices on the machine.

HAZARD OR FAULT SITUATIONS

As soon as operators notice any hazard or fault situation, they must immediately put the machine in safety condition using the following procedures, in order of seriousness, until the hazard or fault situations have been remedied.

Machine emergency stop

§ Using the controls – USING THE MACHINE

Switching off the machine

§ Using the controls – USING THE MACHINE

Disconnecting the machine

Place the disconnection switch in “0” (OFF) position to interrupt supplies to the machine (power, air, etc.).

Other measures

In case of persisting hazard or fault situations, e.g., fire, the operators must abandon the machine work area and initiate the customer’s emergency procedures.

End of hazard or fault situation

Do not cancel the procedures undertaken and do not start the machine again until all hazard and fault situations have been remedied along with the causes that generated them and/or the absence of hazard or fault situations has been determined.

OPERATORS

Under-age persons (under-18s) must not use the machine.

Physically and mentally handicapped persons must not use the machine.

Operators must be trained, skilled and qualified to perform the type of operation to be carried out on the machine.

No other person, except the operators, may access the machine work area or work on the machine.

Operators must wear suitable clothing not likely to become trapped or seized by moving parts of the machine. In particular they must:

- wear tight clothing, buttoned up with tight cuffs, without free flowing parts,
- not wear rings, watches, bracelets, necklaces or other similar objects,
- protect their hair with suitable means.

Operators must use suitable footwear as indicated by accident-prevention regulations and, where necessary, use special individual protective equipment.

Operators must carefully read the safety sheets of the products used in the machine, take all due precautions and use specific personal protective equipment to handle products.

Operators must only work on the machine when they are in perfect mental-physical condition. They must not work in conditions that could reduce speed of reflexes or vigilance.

TECHNICAL SPECIFICATIONS

DESCRIPTION OF MACHINE

The Apache is an impregnating machine for semi-finished constant-profile wood products such as beams, planks and matchboard.
It consists of a particularly strong and resistant supporting structure, consisting of tubular elements and steel plating, electrically welded and painted.
The machine features independent height and side adjustment, with single control of the brush units.

TYPE AND POSITION OF SAFETY NOTICES

Hazard notices

HAZARD! Presence of power voltage: before performing any operation on the electrical system, make sure the power supply is interrupted.

HAZARD! Risk of crushing hands and feet: keep away from mechanical parts which are moving or could start moving.

Prohibition notices

Removing protection and safety devices **IS FORBIDDEN**. The machine protection and safety devices must not be removed except for maintenance jobs in which case measures must straight away be adopted to reduce any ensuing risks.

Obligation notices

Wearing protective eyewear **IS MANDATORY**.

Wearing safety gloves **IS MANDATORY**.

SAFETY AND PROTECTION DEVICES

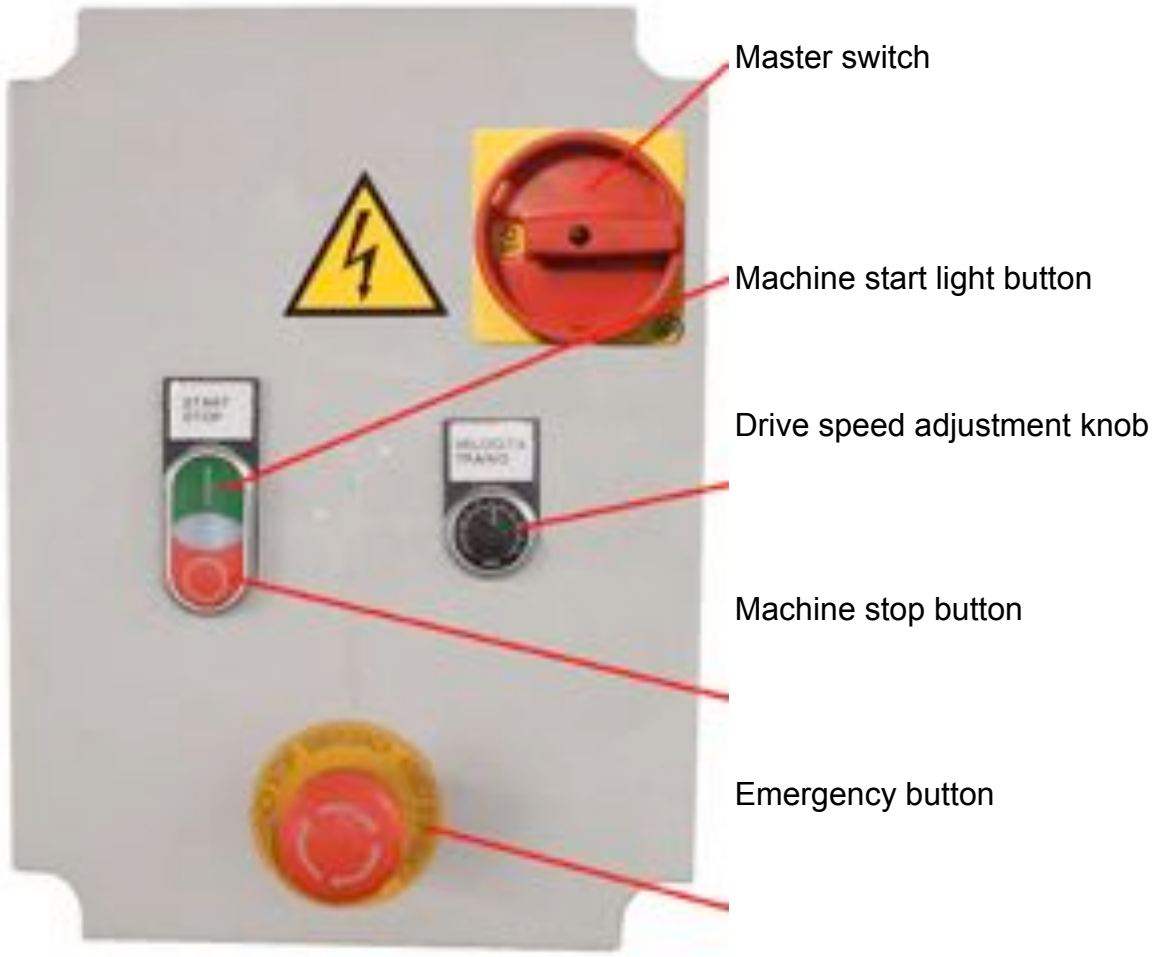
§ Description of the machine – TECHNICAL SPECIFICATIONS

The machine features the following safety or protection devices:

- Emergency button on switchboard. If the emergency button is pressed, the machine stops and all movements are stopped.
- Safety switch on front door. If the front door is opened, the machine and all machine movements are stopped.
- Thermal magnetic cutout for brush rotation. When the thermal magnetic cutout trips, brush rotation is stopped.
- Extracurrent drive roller inverter cutout. When this inverter cutout trips, the drive rollers are stopped.
- Flexible and mobile partitions to delimit the impregnating agent spray area and prevent external contamination.
- Machine movement operator protection guards, made up of panels fastened to the machine bed by means of screws.
- Sealed switchboard featuring door lock. The door can only be released by turning the machine master switch to “0” (OFF) position.

CONTROLS AND INDICATORS

The following image shows the controls and indicators on the switchboard:

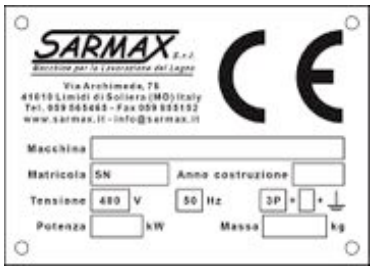


MACHINE WORKING DIRECTION

Standard machine piece feeding is from right side, as shown below. The feed side can be reversed according to the customer's requirements.

MACHINE IDENTIFICATION

The machine is identified by a plate on the right side, in case of right-hand machines.
When communicating with the manufacturer, always quote the details on this plate.



La targa in oggetto porta le seguenti indicazioni:

IDENTIFICATION AND ADDRESS OF MANUFACTURER	SARMAX Srl. VIA ARCHIMEDE, 75 LIMIDI DI SOLIERA (MO)
MACHINE	IMPREGNATING MACHINE
MODEL	APACHE 5 **
SERIAL NUMBER	**
YEAR OF MANUFACTURE	**
WEIGHT KG.	600
THREE-PHASE POWER SUPPLY	
VOLTAGE 400 VOLT FREQUENCY 50 HZ	
INSTALLED POWER kW	5

** See Declaration of Conformity details

TECHNICAL SPECIFICATIONS

EXTERNAL SPECIFICATIONS OF MACHINE		
Machine dimensions (Width x Depth x Height)	161x107x133	cm
Overall dimensions (Width x Depth x Height)	210x127x136	cm
Min/max piece table height off ground	84/ 90	cm
Net machine weight	600	kg
Number of supporting feet	4	
Max weight per supporting foot	1400	kg

INTERNAL CHARACTERISTICS OF MACHINE		
Number of drive rollers	2	
Drive roller diameter	80	mm
Drive speed adjustment	INVERTER	
Min/max drive speed	10/60	m/min
Number of brushes (top / bottom / rh / lh)	2 / 1 / 1 / 1	
Brush diameter	160	mm
Brush rotation speed adjustment	ON-OFF	
Min/max brush rotation speed	400	Rp/min
Number of impregnating agent spray nozzles	4	
Max pneumatic pump flow rate	30	l/min
Number of blowing nozzles	2	

The following technical specifications must be carefully followed by operators.

WORKPIECE SPECIFICATIONS		
Piece material	Wood	
Piece section in length direction	Constant	
Max straightness error every metre of length	1.0	cm
Max parallelism error between lower and upper surfaces	0.5	cm
Min piece section height	1,0	cm
Max piece section height	20	cm
MIN piece section width	8	cm
Max piece section width	30	cm
Min piece length	80	cm
Max length of piece moved manually	150	cm
Max weight of piece moved manually	20	kg
Max length of piece moved using suitable tools	Undefined	cm
Max weight of piece moved using suitable tools	1500	kg
Non-corrosive water-based impregnating agent		

POWER CONNECTION		
Current input	8	A
Power input	5	kVA
Power supply	3P + N + PE	
Operating power voltage	400	V
Operating frequency	50	Hz

COMPRESSED AIR		
Min/Max pump air supply pressure adjustment	2 / 7	bar
Max pump air consumption	21	nm^3/h
Min/max nozzle supply air pressure adjustment	1 / 9	bar
Max air nozzle consumption	20	nm^3/h

OPERATING LIMITS		
Min/max environment temperature	+2 / +45	°C
Min/max environment humidity (without condensation)	5 / 95	U%

TORQUE WRENCH SETTINGS

The following torque wrench settings are given for large-pitch nuts and bolts in minimum class 8.8.

FUNCTION	THREAD	TWS Nm
Generic nuts and screws	M6	5
Generic nuts and screws	M8	13
Generic nuts and screws	M10	25
Generic nuts and screws	M12	44
Nuts and screws for resistance connections	M8	25
Nuts and screws for resistance connections	M10	50
Nuts and screws for resistance connections	M12	87

NOISE LEVELS

The noise levels read according to EN 23746 for acoustic power level and EN 31202 (made of correction k3 according to Appendix A.2 of EN 31204) for sound pressure level at the place of work as indicated by ISO 7960 standard, are shown on the following chart:

Acoustic power level in dB(A)	
Empty LwA:	74.5 dB (A)
In production LwA:	78.4 dB (A)
Sound pressure level in dB(A) at place of work	
Empty LpAq:	79.4 dB (A)
In production LpAq:	82.7 dB (A)

NOTE: the above figures are affected by a constant of imprecision of K = +/- 4dB.

TRANSPORT

Before proceeding with any type of machine movement, perform the following operations:

- make sure the front door is correctly closed,
- make sure all supply sources and all connections have been interrupted,
- tie up cables and pipes so they do not get in the way during transport.

Transport must be made using lifting mechanisms such as fork-lift trucks.

The lifting capacity of the vehicle must, with appropriate safety margin, be above that of machine weight.

The lifting forks, longer than the machine, must be inserted in the openings on the machine front, avoiding the tank unloading area.

§ Technical data – TECHNICAL SPECIFICATIONS

Be very cautious when lifting and make sure the machine is properly balanced and perfectly horizontal.
The machine should be lifted off the ground as little as possible. Transport must be close to the ground, but without sliding on this.

In case of bad fork-lift truck operator visibility due to the dimensions of the machine, another operator should help to indicate the way.

The operators on the ground must keep out of the range of action of the lifting mechanism and its load.

INSTALLATION

All the operations described below must be performed in chronological order without jumping any of them, without reversing the sequence and without adding any further operations.

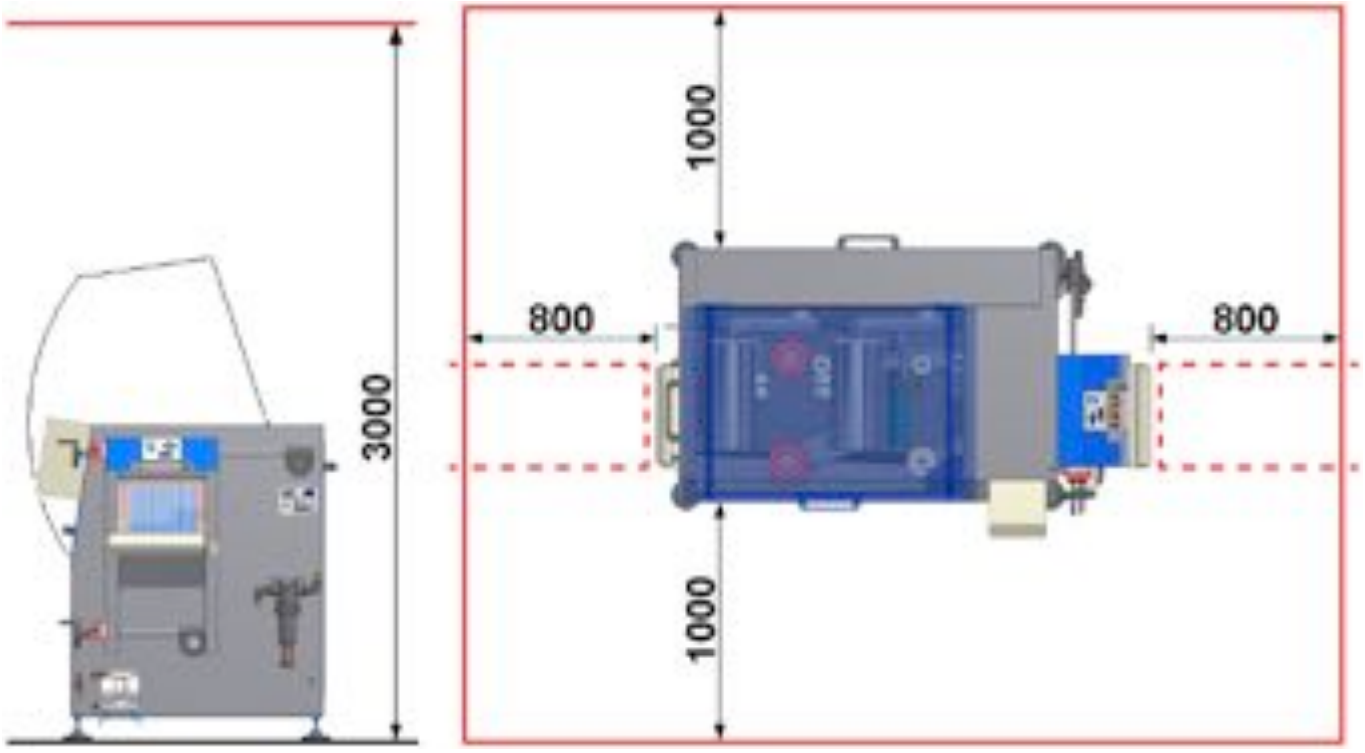
POSITIONING

Make sure the floor has a concrete covering thick enough to ensure secure anchor fastening (not less than 100 mm) and that the concrete has a compression strength of at least 25 N/mm2

Do not install the machine near liquids, gases, concentrations of inflammable powders or potentially explosive atmospheres (NO ATEX environments of any degree or type).

In choosing the position of the machine, always keep to the following minimum distances from the machine, which delimit an area free of all obstacles excepting any loading/unloading conveyors, to allow installation, operation, piece movement and maintenance operations.
The customer shall be responsible for extending such distances in case of any special requirements.

Minimum distances from machine (in mm)



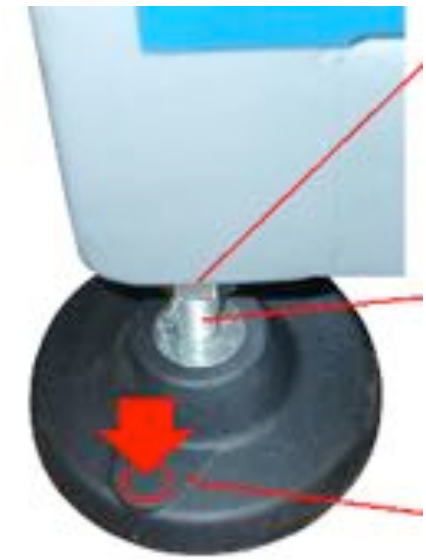
FASTENING

After placing the machine on the ground, drill the floor where each of the feet are and fit an anchor bolt, leaving enough threaded length above the foot for fastening.
Screw up and tighten the retention nuts to the anchor bolts to secure the feet and the machine.

LEVELLING

The machine must be levelled, as follows:

- Obtain a straight wood or aluminium ruler with a minimum length of 2 metres and a spirit level.
- Open the machine front door.
- Position the ruler on the drive rollers, if necessary after moving the brushes by means of the cranks provided.
- Place the spirit level on the line to determine longitudinal machine levelling.
- Loosen the feet lock nuts.
- Turn the feet screws to level the machine and introduce a key in the screw millings.
- Repeat the same operations for transversal levelling, by simply placing the spirit level along the rollers.
- Check the level again in both directions.
- Close the front door of the machine.
- Fasten the feet lock nuts.



POWER CONNECTIONS

Before proceeding with power connections, perform the following operations:
- Carefully check the integrity of the machine.
- Make sure all guards and safety systems are correctly fitted and working.
- Make sure the emergency button is released.
- Make sure the front door is closed.
- Make sure the machine master switch is in “0” (OFF) position.
- Prepare a power cable connected to a protected power supply, with disconnection switch, and with specifications compatible with those of the machine.
- Check the adequacy of the power supply cutout systems and of the earth system.

§ Machine description – TECHNICAL SPECIFICATIONS

§ Technical data – TECHNICAL SPECIFICATIONS

The power supply disconnection switch must be blocked in the “0” (OFF) position with a padlock, the keys of which must be kept by the operator making the power connections.

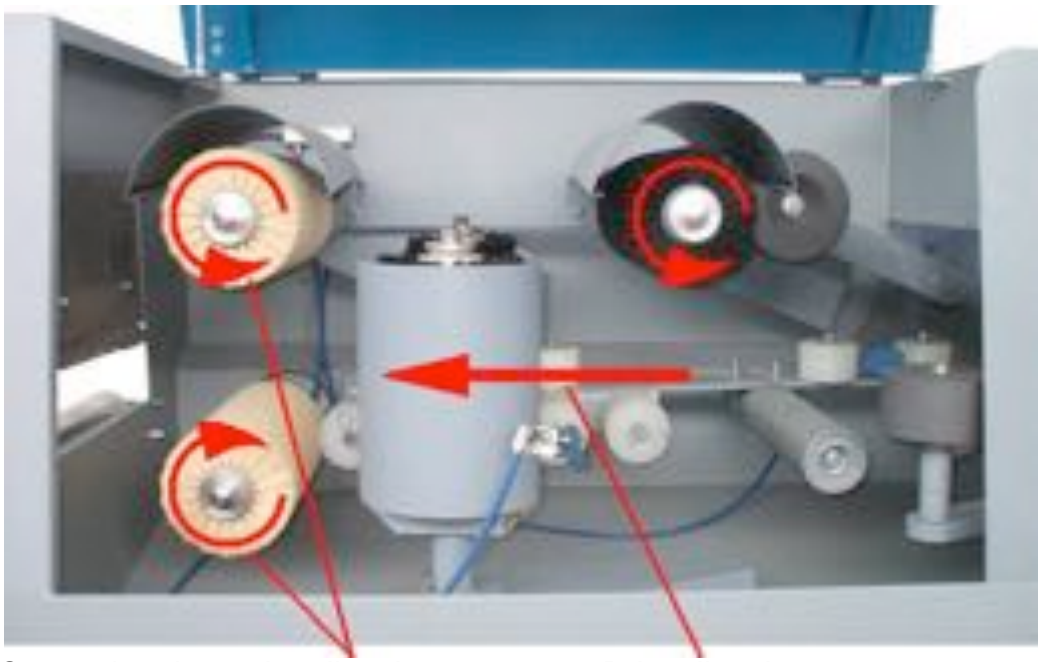
To make the power connections, proceed as follows:
- Open the machine switchboard.
- Connect the power cable to the machine switchboard, the phase wires to the terminals of the master switch and the ground wire to the ground terminal.
- Close the machine switchboard and make sure it is closed correctly.
- Remove the padlock from the power supply disconnection switch.
- Move the power supply disconnection switch to “1” (ON).

Switchboard

CHECKING THE DIRECTION OF ROTATION

§ Using the controls – USING THE MACHINE

- Switch on the machine.
- Start the machine.
- Make a sight check of brush rotation direction.



Standard work direction
Right machine

Correct brush rotation direction Drive direction

If the direction of rotation of the brushes is opposite to the drive direction, the direction of rotation is correct.

If the direction of rotation of the brushes is the same as the drive direction, the direction of rotation is incorrect.

- Switch off the machine.

REVERSING THE DIRECTION ROTATION

This operation is only required if the direction of rotation is incorrect.

The power supply disconnection switch must be blocked in the “0” (OFF) position by means of a padlock, the keys of which must be kept by the operator making the power connection.

- Open the machine switchboard.
- Inside the switchboard, switch over the wires of two power cable phases on the terminals of the master switch.
- Close the machine switchboard and make sure this is correctly closed.
- Remove the padlock from the power supply disconnection switch.

- Move the power supply disconnection switch to “1” (ON) position.
- Repeat rotation direction control.

COMPRESSED-AIR CONNECTION

Before making compressed-air connections, perform the following operations:
- Make sure the customer's compressed-air system has specifications compatible with those of the machine.
- Prepare two hose pipes, one for each machine inlet, each connected to a disconnectable supply point of the customer's compressed-air plant.

§ Machine description – TECHNICAL SPECIFICATIONS

§ Technical data – TECHNICAL SPECIFICATIONS

Each compressed-air supply disconnection switch must be blocked in the "0" (OFF) position with a padlock, the keys of which must be kept by the operator making the compressed-air connection.

To make the compressed-air connection, perform the following operations:
- Connect the two hoses to the two compressed-air inlets of the machine.
- Remove the padlock from the compressed-air supply disconnection switches.
- Place the compressed-air supply disconnection switches on "1" (ON).
- Set the compressed-air regulators according to need, within the acceptable machine setting ranges.

Check the pressure settings on the pressure gauges.

START-UP

Start-up is split into two phases:

- Using the machine empty to check the operation of all the machine parts; make sure the operator knows how to use the controls properly.
- Using the machine on a small sample lot to check machine performance and correct use of the work adjustments by the operator.

 USING THE MACHINE

USING THE MACHINE

USING THE CONTROLS

 § Controls and notices – TECHNICAL SPECIFICATIONS

Switching on the machine
Turn the machine master switch to “1” (ON) position.

Switching off the machine
Turn the machine master switch to “0” (OFF) position.

Starting the machine
 Make sure there are no objects inside the machine.

- Make sure the emergency button is released.
- Make sure the front door is closed.
- Press the machine start button.

 Make sure the machine start button has switched on.
Check the start of drive roller and brush movement.

Machine stop
Press the machine stop button.

 Make sure all movements have stopped.

 Make sure the machine start button has switched off.

Machine emergency stop
Press the emergency button.

 Make sure all movements have stopped.

 Make sure the machine start button has switched off.

Releasing the emergency button
Turn the red mushroom-shaped button clockwise until it releases and jumps back out.

Drive speed adjustment

Set the machine drive speed by turning the drive speed knob.

Brush adjustment

Stop the machine.

Makes sure there are no objects inside the machine.

- Release the adjustment handwheels by means of the handwheel lock levers.
- Adjust the brushes in height or sideways, by means of the corresponding adjustment handwheels.
- Lock the adjustment handwheels by means of the handwheel lock levers.

Check brush movement directly and on the brush adjustment readers.

Make sure the opening of the mobile partition protecting piece outfeed is compatible with the dimensions of the pieces being machined.

Pneumatic pump operation

The pneumatic pump performs the following operations, each controlled by a specific valve:

- impregnating agent spray nozzle supply,
- washing gun supply.

Only one operation can be performed at a time.

Make sure the valves corresponding to the required functions are open and that all the others are closed.
Make sure the supply hose is properly positioned.

Open the air supply valve to the pneumatic pump, positioned at the outlet of the pneumatic pump air regulator, by turning the lever to “ON” position.

Check correct hydraulic flow.

Pneumatic pump stop

Close the air supply valve to the pneumatic pump, positioned at the outlet of the pneumatic pump air regulator, by turning the lever to “OFF” position.

Make sure the hydraulic flow has stopped.

Pneumatic pump air supply valve

Impregnating agent spray start

Make sure the front door is closed.

Carefully read the safety sheet (MSDS) of the impregnating agent and carefully follow the instructions provided.

Use suitable personal protection equipment when handling the impregnating agent. Avoid the liquid coming into contact with the skin and mucous membranes. Do not inhale. Do not swallow.

Handle the impregnating agent with care. Avoid splashes and overflows.

- Place an impregnating agent container underneath the tank drain.
- Place the suction hose, with its filter, in the impregnating agent container.
- Make sure the filter is on the bottom of the impregnating agent container.

Tank drain

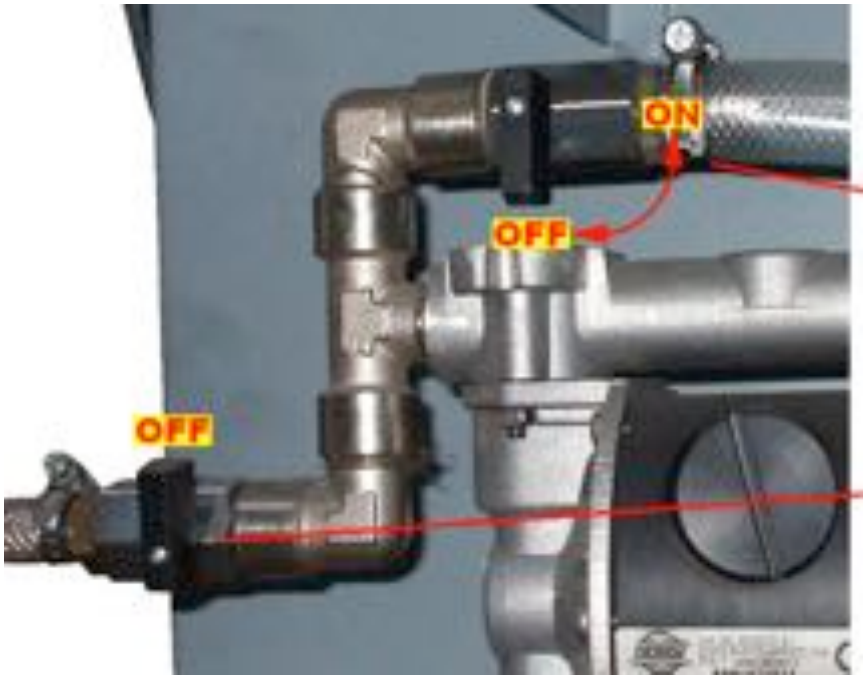
- Open the spray nozzle valves required to operate by turning the lever to “ON” position.
- Close the spray nozzle valves required not to operate by turning the levers to “OFF” position.

Spray nozzle valves and nozzle diagram

Make sure at least one spray nozzle valve is open.

- Open the impregnating agent supply valve by turning the lever to “ON” position.

Make sure the washing gun supply valve is closed.



Impregnating agent supply valve

Washing gun supply valve

- Operate the pneumatic pump.

Make sure the hydraulic flow is correct.

Allow the impregnating agent to circulate for one or two minutes before impregnating pieces, to obtain a uniform flow.

Check the level of the impregnating agent in its container before the suction hose filter is uncovered.

Impregnating agent spray stop

- Stop the pneumatic pump.
- Close the impregnating agent supply valve by turning the lever to “OFF” position.
- The spray nozzle valves can remain in set position.

Make sure the hydraulic flow has stopped

WASHING THE MACHINE

To ensure long and problem-free running, regular and careful machine washing is essential.

TYPE OF WASH	FREQUENCY *
Impregnating agent filter cleaning	Before every spray nozzle wash
Spray nozzle washing	Every 8 hours and every time before switching off the machine
Tank washing	Every time before switching off the machine
Suction hose filter cleaning	Every time before switching off the machine

(*) The frequency intervals are calculated in machine-on hours.

The machine must only be washed when it is switched off.

Carefully read the impregnating agent safety sheet (MSDS) and carefully follow the instructions provided.

Use suitable personal protection equipment when handling the impregnating agent. Avoid the liquid coming into contact with the skin and mucous membranes. Do not inhale. Do not swallow.

Handle the impregnating agent and the washing water carefully, avoiding splashing and overflows.

Carefully abide by the regulations in force as regards storage and disposal of impregnating agent and washing water residues.

Impregnating agent filter cleaning

- Fit a suitable empty container underneath the impregnating agent filter.
- Open all the spray nozzle valves by turning the levers to “ON” position.
- Open the impregnating agent supply valve by turning the lever to “ON” position.
- Open the impregnating agent filter valve by turning the lever to “ON” position.
- Wait for the impregnating agent to stop running into the container.
- Close all the spray nozzle valves by turning the levers to “OFF” position.
- Position the suction hose filter in the air and at a higher point than the pneumatic pump.
- Operate the pneumatic pump.
- Wait for the impregnating agent to stop running into the container.
- Stop the pneumatic pump
- Close the impregnating agent supply valve by turning the lever to “OFF” position.
- Close the impregnating agent filter valve by turning the lever to “OFF” position.

During cleaning, adjust the opening of the impregnating agent filter valve to prevent splashes and overflows.

Impregnating agent filter

Impegnating agent filter ring nut

Impregnating agent filter container

Impregnating agent filter valve

Spray nozzle washing


Make sure the front door is closed.

- Place a clean water container under the tank drain.
- Place the suction hose, with its filter, in the container.
- Make sure the filter is on the bottom of the container.
- Open all the spray nozzle valves by turning the levers to “ON” position.
- Open the impregnating agent supply valve by turning the lever to “ON” position.


Make sure the washing gun supply valve is closed.

- Operate the pneumatic pump.


Check proper hydraulic flow.

- Allow the water to recirculate for one or two minutes.
- Stop the pneumatic pump.
- Close the impregnating agent supply valve by turning the lever to “OFF” position.


Make sure hydraulic flow has stopped.

Tank washing

- Open the front door.
- Place a container of clean water underneath the tank drain.
- Place the suction hose, with its filter, in the container.
- Make sure the filter is on the bottom of the container.
- Open the washing gun supply valve by turning the lever to “ON” position.


Make sure the impregnating agent supply valve is closed.

- Operate the pneumatic pump.
- Grip the washing gun.
- Press the gun lever to obtain a jet of water. Release the lever to interrupt the water supply.


Direct the water jet only inside the tank.
Direct and regulate the jet so as to avoid splashes outside the tank.


Do not direct the jet towards people, animals or delicate materials.
Do not direct the jet towards external parts of the machine, especially electrical parts.


Carefully clean the tank, the impregnating agent spray area and the spray nozzles, the brushes, the drive rollers, the guide rollers, the pressor rollers and the blowing nozzles.

- Stop the pneumatic pump.
- Close the washing gun supply valve by turning the lever to “OFF” position.
- Close the front door.

MACHINE OPERATION SAFETY RULES

- Using the machine when any component parts are not in perfect condition, especially those intended to ensure safe machine use, is forbidden.
- Removing or tampering with any safety or protection device on the machine is forbidden.
- The operating machine must be monitored by at least one operator.
- During machine use, operators must be able to communicate easily and without any possibility of misunderstandings.
- Assess the possibility of outstanding risks, especially those tied to specific use, before starting to use the machine.
- The drive speed must be set so the operator responsible for unloading workpieces has a sustainable work pace, without any risk of material build-up.
- The brushes must be compatible with machine specifications.
- The workpieces must be compatible with machine specifications.
- Only ever work with materials for which the machine was designed.
  Working not expressly authorized materials is forbidden, especially materials that are easily inflammable and which can cause explosive mixes (ATEX atmospheres).
- The workpieces must be integral, and must not be susceptible to breakage or chipping.
- Working pieces without a stable support is forbidden.
- The height of the brushes and of the presser rollers must be compatible with the workpiece height.
- The width of the brushes and of the presser rollers must be compatible with the workpiece width.
- The workpieces must be introduced with their length parallel to the drive direction, Never place them crossways.
- Never feed workpieces at a speed above drive speed.
- Working several pieces at the same time is forbidden, especially if these are of different heights.
- Using toxic products or which are hazardous for the operator's health or likely to harm the environment is forbidden.

§ Technical data – TECHNICAL SPECIFICATIONS

Controls

TYPE OF CONTROL	FREQUENCY
Machine integrity and functionality	Every time the machine is switched on
Workpiece dimensions before machining	At the start of each lot and every 10 workpieces
Workpiece finish after machining	At the start of each lot and every 10 workpieces

RESIDUAL RISKS

Workpiece infeed and outfeed openings

The workpiece infeed and outfeed openings are not protected against the introduction of foreign materials or operator access, especially when the openings are free and not engaged by a workpiece being machined.

Introducing foreign material into the machine, especially through the workpiece infeed and outfeed openings is forbidden.
The workpieces must only be introduced through the workpiece infeed opening

The operator must not attempt to access the inside of the machine, especially through the workpiece infeed and outfeed openings.

At the end of each work session, switch off the machine.

Workpiece ejection

During machining operations, pieces or piece parts or pieces of tools can be ejected at high speeds through the workpiece infeed and outfeed openings.

Never stand in front of the workpiece infeed and outfeed openings.

Outstanding energies

When the machine is stopped, hazardous outstanding energies can exist such as:
- kinetic energies of moving parts (e.g., tools); these pass in one minute,
- thermal energies due to machining or electro-mechanical movements (e.g., machined pieces, tools, electric motors); these pass in a few minutes,
- compressed air (e.g., circuits under pressure, pneumatic actuators under pressure). These can take time to disappear (depending on pneumatic component leaks).

Only open the front door after switching off the machine and making sure no risk situations exist.

Never touch mechanical moving parts.

Never touch high-temperature machine parts or pieces being machined.

Remain at a safe distance from pneumatically-operated moving parts.

Do not disconnect the pneumatic circuits.

RULES FOR CORRECT MACHINE USE

- Always use roller conveyors to load and unload the machine.
  The length of the loading roller conveyor must be at least ¾ the maximum length of the workpiece.
  The length of the unloading roller conveyor must be at least one and a half times the maximum length of the workpiece.
- Before machining a lot of workpieces, adjust the brushes to adapt them to the piece section.
  If adjustment is made correctly according to the dimensions of the workpieces, the brushes interfere with the workpiece to the right extent, just a few millimetres, so the impregnating agent is properly spread on the workpieces while the presser rollers push the pieces against the drive rollers with the force required to prevent slipping but without causing too much stress.
- The drive speed must be set according to the dimensions of the workpieces. The larger the workpiece, the less the speed must be. Conversely, for smaller workpieces, the drive speed can be increased.
  In any case, during the first periods of machine use, it is best to proceed at reduced speed so as to allow operators to become acquainted with the best drive speeds according to the characteristics of the pieces being machined.
- The pressure of the compressed air at the pneumatic pump must be adjusted according to the number of operating spray nozzles and required impregnating agent flow.
  For purposes of best impregnating agent use, both in terms of consumption and uniform covering, it is best to have more nozzles operating at medium pressure rather than fewer nozzles operating at high pressure.
- The compressed-air pressure at the blowing nozzles must be adjusted according to the geometry of the workpieces. The more deep slots there are, the higher the pressure will have to be to eliminate the drops of impregnating agent inside the slots.
- The workpiece to be treated must be placed on the loading roller conveyor and kept up against the side reference stop of the roller conveyor before being accompanied towards the infeed mouth of the impregnating machine until the drive system moves it independently, after which the workpiece must be immediately released and another inserted using the same procedure followed for the first piece.
  The insertion operation can be repeated as long as the dimensions of the section of the pieces to be inserted are identical, otherwise the machine will have to be regulated again.

MAINTENANCE

MAINTENANCE SAFETY PRECAUTIONS

Placing the machine in safety condition

Before proceeding to do any maintenance jobs, perform the following operations:

- Switch off the machine,
- Block the master switch of all machine supplies (power, air, etc.) in “0” (OFF) position using a padlock, the keys of which must be kept by the machine operator,
- Affix a clearly visible notice on the machine indicating “MACHINE OUT OF ORDER – KEEP AWAY”.

Maintenance precautions

- The maintenance technicians must wear suitable individual protection gear.
- The maintenance technicians must use suitable tools, equipment and electrical apparatus and adopt every precaution so as not to damage the machine.
- Mechanical component parts must only be replaced by original ones.
- Mechanical small parts must only be replaced with original ones or similar ones having the same or better mechanical characteristics.
- Electrical component parts must be replaced with original ones or other compatible ones having the same or better electrical characteristics.

End of placing the machine in safety condition

Before removing the padlock and the “MACHINE OUT OF ORDER – KEEP AWAY” notice, the following conditions are required:

- the maintenance job must be completely finished and have been successful,
- the machine must have been returned to its original condition of safety and efficiency,
- all the safety devices and guards must have been examined,
- a check must have been performed to make sure there are no foreign objects inside the machine.

End of maintenance

Before using the machine again after maintenance jobs, perform the following operations:

- check all movements, especially if these have undergone maintenance,
- make sure all the safety devices and guards are in good working order,
- inform the machine operators about the type of maintenance jobs performed.

ROUTINE MAINTENANCE

Operators must perform the following routine maintenance jobs according to the schedules indicated and every time the need arises:

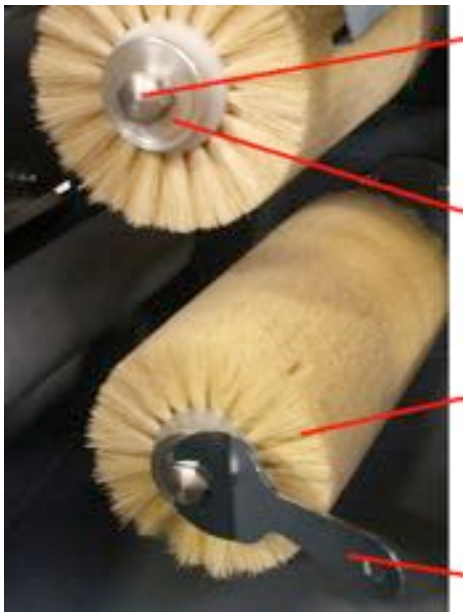
TYPE OF MAINTENANCE	FREQUENCY **
Checking the safety devices and guards	Before every machine switch-on
General machine and work area cleaning	Before every machine switch-on and every 8 hours
Cleaning the brushes	Every time the machine is switched off
Washing the impregnating agent filter	Every time the machine is switched off
Lubrication	Every month and every 160 hours
Checking belt and chain tension	Every month and every 160 hours
Checking the oil level in the reduction units *	Every year and every 1600 hours
Cleaning the filter and topping up the oil in the compressed-air inlet FRL unit	Every month and every 160 hours

(*)Only reduction units above size 30 inclusive; the smaller reduction units are lubricated for life.

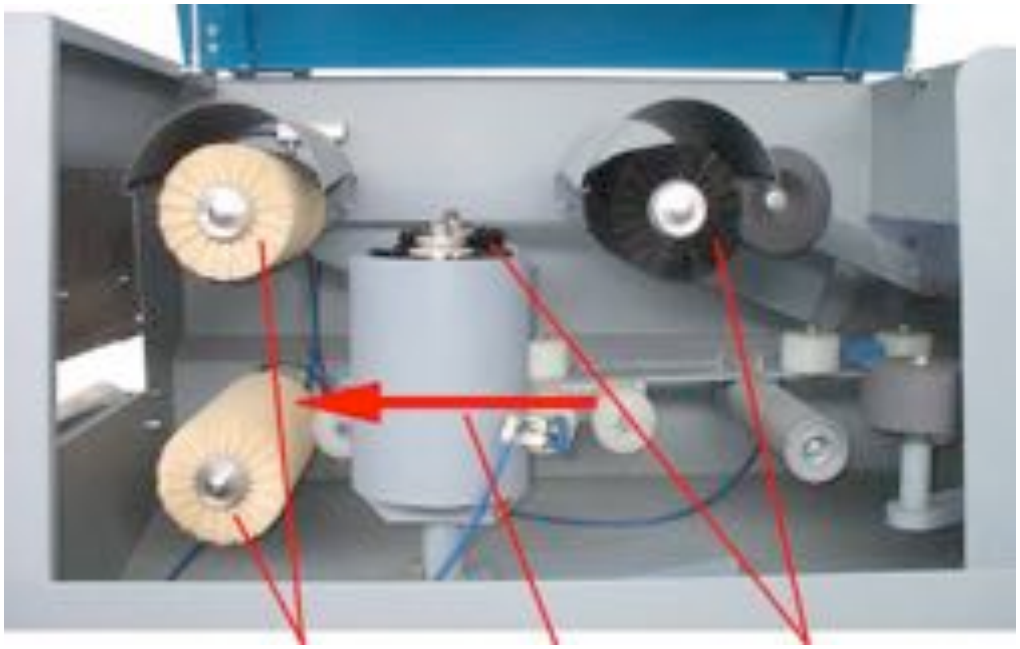
(**) The frequency intervals are calculated in switched-on machine hours.

Brush washing

- Open the front door.
- Remove the brush retention screws using the wrench provided.
- Remove all the brushes and related retention cones.



- Carefully wash the brushes, removing all traces of impregnating agent and scale.
- Vertically soak the brushes in a container full of clean water. Make sure they are completely covered and at a distance the one from the other.
- Leave the brushes to soak until the machine is used again, regularly changing the water in the container until it becomes visibly dirty.
- When necessary, take the brushes out of the water, perform a final rinse with clean water and dry carefully.
- Fit the brushes on the supporting spindles and the retention cones in the right order
- Screw up and tighten the retention screws.
- Close the front door.



Impregnating agent filter washing

- Clean the impregnating agent filter.

Make sure the pneumatic pump has stopped.

Make sure all hydraulic flows have stopped.

- Remove the impregnating agent filter container.
- Wash the impregnating agent filter and the sieve filter this contains with water, in a special container.
- Fit the impregnating agent filter container.

Make sure the impregnating agent filter valve is closed by moving the lever to “OFF” position.

Impregnating agent filter

Impregnating agent filter ring nut

Impregnating agent filter container

Impregnating agent filter valve

Lubrication

The parts of the machine that have to be lubricated with grease are:

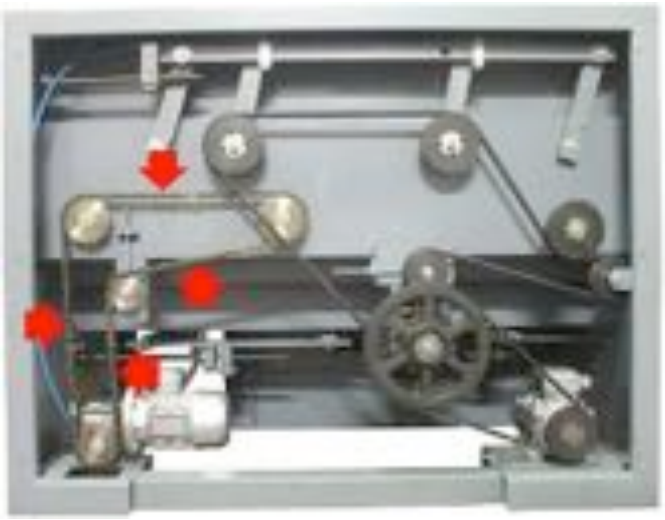
- Brush adjustment screws.
- Drive roller movement chain.
- Brush axes.
- Drive roller axes.
- Presser roller axes.

To lubricate the indicated parts, perform the following operations:

- remove the rear protection panel.
- lubricate the various parts using a lubrication pump for the axes which feature a lubricator and a hard-bristle brush for the other parts.
- fit the rear protection panel.

Guide screws

Movement chain



Brush axes

Drive roller and presser axes

Checking chain tension

To check the tension of the drive roller movement chain, proceed as follows:

- remove the rear protection panel,
- push at centre, to the left, the vertical branch more to the left than the chain with a force of 100 N (about 10 kgf),
- if the chain flexes by about 10 mm, it is correctly tensioned,
- if the chain flexes by more than 20 mm, it is not tight enough and chain adjustment must be made
- fit the rear protection panel.

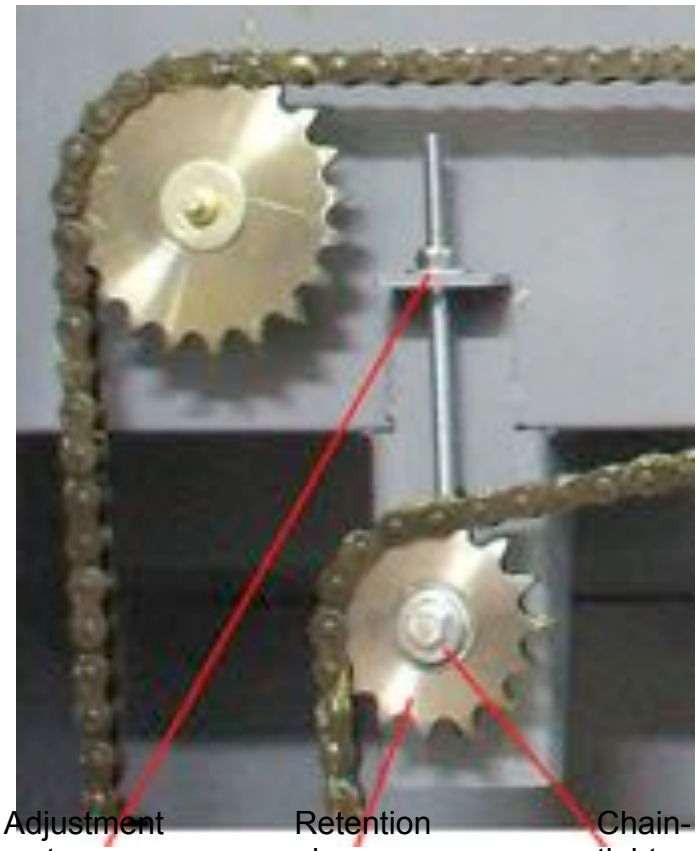
Chain adjustment

To adjust the drive roller movement chain tension, proceed as follows:

- remove the rear protection panel.
- loosen the chain-tightener retention pin,
- screw up or loosen the adjustment screw to increase or reduce chain tension,
- tighten the chain-tightener pinion retention pin,
- check the chain tension,
- fit the rear protection panel back on.

Chain tension check

Chain adjustment



Adjustment nut

Retention pin

Chain-tightener pinion

Inadaquate tension can cause chain jumps and anomalous wear of the chain and pinions.
Too much tension can cause early wear of the mechanical parts and of the chain with possible sudden breakdrowns.

Checking belt tension

To check the tension of the brush movement belt proceed as follows:

- remove the rear protection panel,
- push at centre, downwards, the horizontal branch higher than the belt with a force of 100 N (about 10 kgf),
- if the belt flexes by about 20 mm, it is properly tensioned,
- if the belt flexes by more than 40 mm, its tension is inadequate and the belt will have to be adjusted,
- fit the rear protection panel.

The belt must be replaced when clearly worn or if it starts to break.

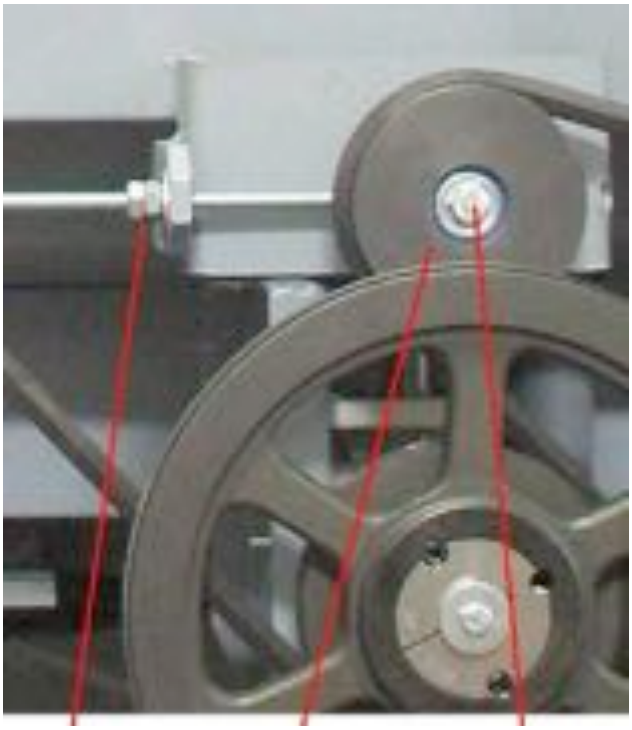
Belt adjustment

To regulate the tension of the brush movement belt proceed as follows:

- remove the rear protection panel.
- loosen the belt-tightener pulley retention pin,
- screw up or loosen the adjustment screw to increase or decrease belt tension,
- tighten the belt-tightener pulley retention pin,
- check belt tension,
- fit the rear protection panel.

Check belt tension

Belt adjustment



Adjustment nut | Belt tensioning pulley | Retention pin

Inadequate tension will cause slipping, local overheating and wear.
Over-tightening will cause early wear of mechanical parts and belt with possible sudden breakdowns.

In the same way, check and regulate motor belt tension.

Checking the oil level in the reduction units

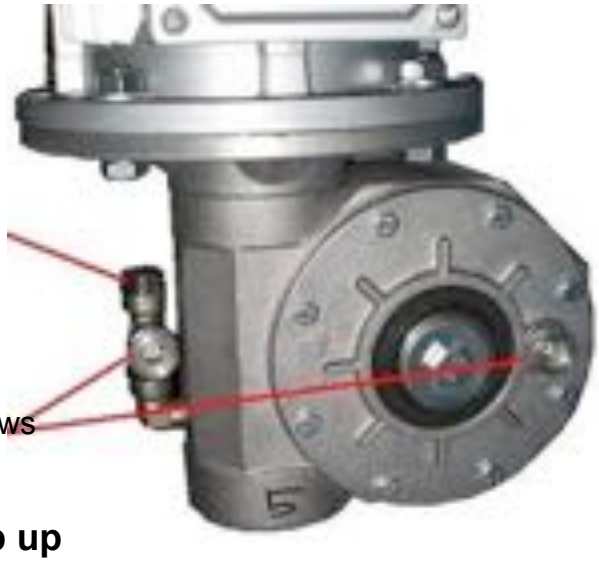
To check the oil level in a reduction unit, perform the following operations:

- remove the rear panel guard,
- display the oil level in the oil level check window provided,
- fit the rear panel guard back on.

If the oil level is at the lower limit of the window, the oil in the reduction unit will have to be topped up.

Oil top-up cap

Oil level check windows



Reduction unit oil top up

To top up the oil in a reduction unit, proceed as follows:

- remove the rear panel guard,
- unscrew the oil top-up cap,
- add oil, of the type shown on the reduction unit oil chart, up to the centre point of the oil level check window,
- screw up the oil top-up cap,
- fit the rear panel guard back on.

If the level of the oil is at the upper limit of the oil level check window, the excess oil will have to be removed.

Reduction unit oil chart

TYPE OF REDUCTION UNIT	TYPE OF OIL	BRAND	CODE
WORMSCREW	SYNTHETIC	AGIP	Tellum Oil VSF 320
		KLUBER	Syntheso D 220 EP
		SHELL	Tivella Oil Sc 320
		ESSO	Glicolube Range 220
COAXIAL	MINERAL	AGIP	Blasia 220
		KLUBER	Lamora 220
		SHELL	Omala 220
		ESSO	Spartan EP 220

SPECIAL MAINTENANCE

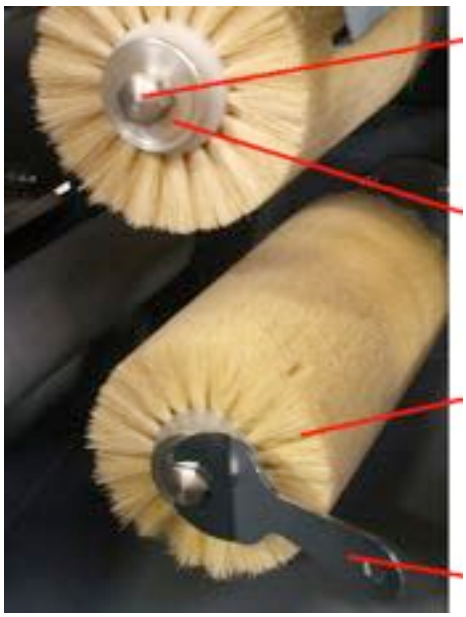
Replacing the brushes

The brushes must be replaced when:

- the brush wires have become too hard, leaving impregnating agent streaks on the pieces,
- the height of the wires has become reduced, and does not touch some parts of the pieces and does not uniformly spread the impregnating agent.

To replace a brush, proceed as follows:

- open the front door.
- Remove the brush retention screw using the wrench provided.
- Take off the brush and the relevant retention cone.



- Fit the new brush on the supporting spindle and then the retention cone in that order.
- Screw up and tighten the retention screw.
- Close the front door.

TROUBLESHOOTING

In case of a fault, carry out a sequence check of all the listed faults.
A fault can also be caused by another previous fault which has not been identified.

Before doing any maintenance jobs to remedy faults, the cause of the fault must be well understood. Often there are several causes which occur at the same time in cascade.
A fuse does not burn out, a thermal magnetic cutout does not trip unless there is some upstream cause.
If such causes are not clear, do not perform any maintenance jobs but place the machine in safety condition and contact the manufacturer.

§ Safety precautions for maintenance - MAINTENANCE

FAULT	CAUSE	REMEDY
The machine fails to switch on	No power is reaching the machine	Check the power supply and the disconnection switch
The machine fails to switch on	The switchboard door is not properly closed	Correctly close the switchboard door
The machine fails to switch on	The emergency button has been pressed	Release the pressed emergency button
The machine fails to switch on	The front door is open	Close the front door
The machine start button does not come on	The bulb of the machine start button has burned out	Replace the bulb
Brushes fail to start	A thermal magnetic cutout has tripped	Reset the thermal magnetic cutout
Drive movement fails to start	The drive roller inverter cutout has tripped	Switch the machine off and on and start it again
Drive movement fails to start	The drive belt protection fuses have tripped	Replace the fuses

SCRAPPING THE MACHINE

The machine mainly consists of metal, and therefore of highly recyclable materials. Only a few parts are made of materials of plastic or rubber origin.
Once the operating life of the machine has come to an end, it must be disposed of through standard industrial waste collection and disposal centres.

WARRANTY AGREEMENT

1) The manufacturer undertakes to deliver machines in conformity with agreements made and without faults such as to make them unsuitable for the use for which machines of the same type are usually intended.
2) The manufacturer disclaims liability for faults affecting electric and electronic parts, machine conformity faults and faults caused by normal wear and tear of those parts which, by their very nature, are subject to fast and continuous wear (e.g.: seals, belts, brushes, fuses, etc.).
Similarly, the manufacturer disclaims liability for machine conformity faults and faults caused by failure to observe the instructions in the instruction manual and by bad use and treatment of the machine.
The manufacturer also disclaims liability for conformity defects and faults caused by negligence and/or the wrong use of the machine by the buyer or by having made changes or repairs without the prior written consent of the seller.
The manufacturer disclaims liability for incorrect machine commissioning whenever such commissioning is not done directly by it.
The manufacturer disclaims liability as regards machine operating faults caused by piece feed and evacuation systems not supplied and commissioned by the manufacturer, feed systems such as, for example, idle roller conveyors or motorised roller conveyors.
3) Whenever the parties have not agreed that machine start up is to be done in the buyer's facility, this warranty shall last 12 months from the date of delivery.
Whenever on the other hand it is agreed between the parties that start up is to be done in the buyer's facility, this warranty shall last 12 months from the start-up date at the buyer's and, in any case, no longer than 15 months from the date of machine delivery.
Operating hours of more than 48 hours a week shall result in proportionate reductions of the warranty period.
The warranty covering replaced or repaired parts shall be invalidated on the same day of expiry of the machine warranty.
4) The buyer, under penalty of warranty invalidation, shall notify the conformity defect or machine fault directly to the machine manufacturer (see CE plate on the machine) specifying the nature of the fault in detail in writing within 15 days from when this has been discovered or should have been discovered by it by means of careful machine inspection and testing.
The warranty shall also be invalidated in the event of the buyer not permitting all reasonable inspections requested by the manufacturer and if, the manufacturer having requested that the faulty piece be returned at its own expense, the buyer fails to return such piece within a short time from the request.
5) Following due notification by the buyer, made according to para. 4, the manufacturer, after ascertaining the existence of the fault, shall:
a) supply to the buyer free of charge the parts required to replace the faulty ones;
or:
b) make the repairs or have these made by third parties at its expense.
Any supply of parts to replace the faulty ones shall be made by the manufacturer Ex-works. In case of a technician being required, the relevant costs shall be charged
6) Excepting in the case of fraud (or serious fault) on the part of the manufacturer, any payment of any damages to the buyer shall not in any case exceed the share of the value of the parts indicated at para. 5.
The warranty includes and replaces the warranties or liabilities required by law, rules out any other liability of the manufacturer, howsoever caused by the supplied goods, and excludes liability for missing income and/or down times; in particular, the buyer shall not be entitled to make any further claims for damages, price reductions or termination of the contract.
7) Once the warranty period has passed, no further claims may be made against the manufacturer.

ACCESSORY NOTICES

This machine belongs to the manufacturer only. It must only ever be used by the machine buyer.

Pursuant to applicable laws, the buyer may not reproduce, copy in any form or using any medium, or transfer any parts of this manual to third parties without the written permission of the manufacturer.

The manufacturer reserves the right to update its products and manuals, without being obliged to update previous products and manuals, except in exceptional cases; in any case such decision is at the discretion of the manufacturer.

The user may contact the manufacturer at any time to ask for further details besides those contained in the manual or to make upgrading proposals.