VERTICAL WASHING MACHINE – SM63V

4 BRUSH - 1 RINSE - 1 AIR KNIFE SET

CE

User and Maintenance Manual

Index of pictures

Introduction

This manual includes machine maintenance and user instructions. Its content is addressed to operators that have been previously trained about the precautions that must be used in the presence of movable parts, fragile materials that are potentially sharp and live parts.

The manual concerns the standard versions of the machine; possible customizations are dealt with in specific attachments.

How to use and keep the manual

The purpose of this manual is to supply the correct instructions for using the machine and performing the relevant routine maintenance in safe conditions. This text does not take into consideration possible extraordinary maintenance operations, as they falls under the exclusive competence of the assistance technician, who must fix the machine in compliance with design and technical features for which it was built.

Reading this manual is essential, but it cannot replace the skill of the technical personnel who must undergo a suitable preliminary training.

The manual must be kept undamaged and in good conditions during the entire life of the machine. After being used, place the manual in a safe and sheltered place, together with the EC certification of conformity.

The machine was manufactured in compliance with the directives in force within the European Community and the technical standards that acknowledge the relevant requirements, as it is certified in the Declaration of Conformity subscribed by the manufacturer.

The information contained in the manual cannot be disclosed. Any partial or total duplicate that has not been authorized by SOMACA/CRL in written form, which was obtained by means of photocopying, duplication or other systems, even by electronic acquisition, will infringe the copyright, therefore it can be punishable by law.

Reference standards

The machine was designed and manufactured in compliance with the following Directives and Standards:

[1] Directive 2006/42/EC “Machinery Directive”

[2] Directive 2006/95/EC “Low Voltage”

[3] Directive 2004/108/EC “Electromagnetic Compatibility”

[4] UNI EN ISO 12100-1-2:2005 Safety of machinery – Fundamental concepts, general design principles

[5] UNI EN 953:2000 Safety of machinery – General requirements for the design and the construction of fixed and movable guards

[6] UNI EN 1037:1997 Safety of machinery – Prevention of unexpected start-up

[7] UNI EN ISO 13849-1:2007 Safety of machinery – Safety-related parts of control systems – General design principles

[8] UNI EN ISO 13857:2008 Safety of machinery – Safety distances to prevent danger zones being reached by upper and lower limbs

[9] CEI EN 60204-1 Electrical equipment of machines - Part 1: General requirements

[10] UNI EN 13035-9:2006 Machines and plants for the manufacture, the treatment and the processing of flat glass – Safety requirements – Part 9: Washing installations

Description and features

1.1. Identification

1.1.1. Supplier's data

Sommer & Maca Machinery Division
C.R. Laurence Co., Inc.
Los Angeles, CA
USA

1.1.2. Marking data

Machine: Vertical washing machine

Model: SM63V

1.2. Function of the machine

The machine is intended to wash glass with water.

The plate is manually loaded into the input roller conveyor, which transfers the glass lites inside the washing unit. Here, the glass lites is washed with water, in case demineralised and heated up to 40°C/104°F. The washing is performed by means of rotating brushes.

After that, the glass lites undergoes a drying process by means of air knifes, and then it is transferred into the output roller conveyor, from which the glass will be manually unloaded.

During the entire path, the glass lites always keeps on the carrying rollers, in vertical position and inclined by 6°.

The roller conveyors and the carrying system inside washing and drying units are motor-driven: the interaction between the operator and the machine during normal use is just limited to plate loading and unloading operations.

Prohibited use

It is expressly prohibited to use the machine for uses other than the one described above or by using washing means other than water, in case demineralised.

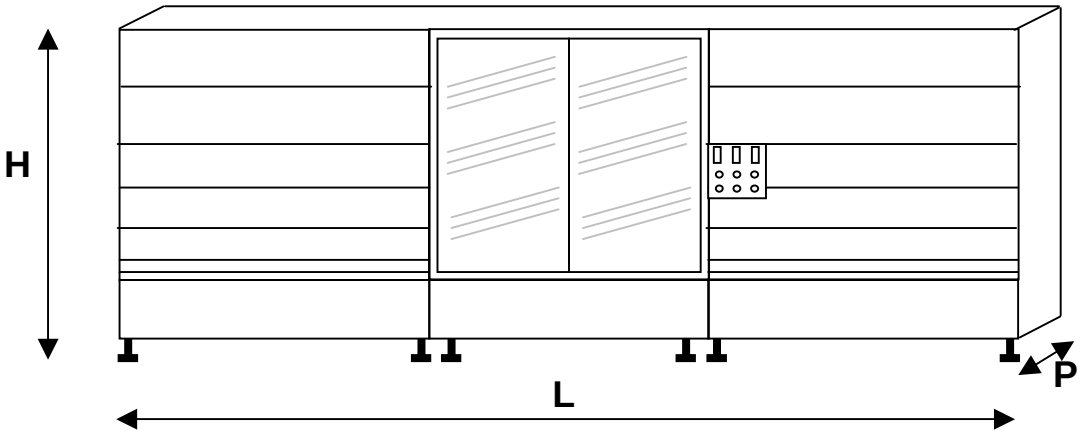
Furthermore, it is prohibited to use the machine in a potentially explosive atmosphere.

1.3. Features of the machine

1.3.1. Emission of airborne noise

The measured sound pressure is lower than 80 dBA.

1.3.2. Technical data



Model SM63V	L [mm] L [in]	H [mm] H [in]	P [mm] P [in]
	5300 209	2250 89	1300 51

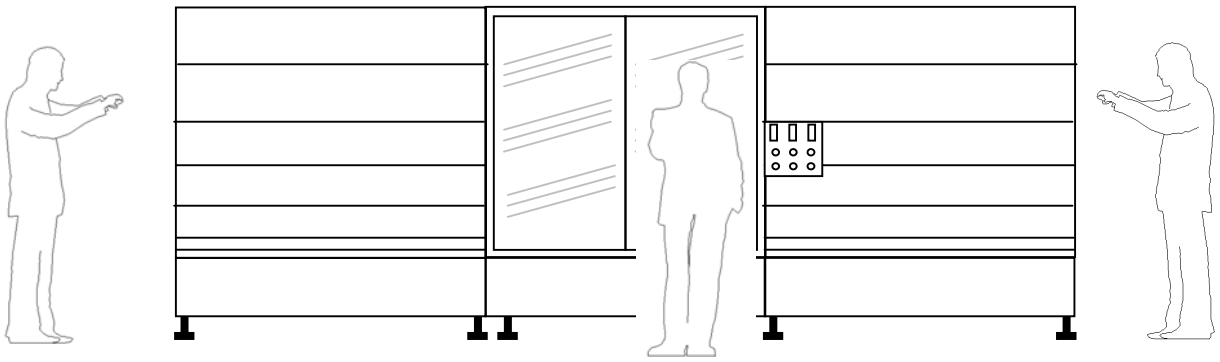
MODEL	SM63V			
ELECTRICAL FEATURES				
GENERAL CONNECTION	See the wiring diagram			
INSTALLED POWER	9			KW
CAPACITY OF THE FAN WITH 15°-760mmHg	545-640			m^3/h
FAN MOTOR	6			HP
NR. 3 WASHING PUMPS	0.5/each			HP
SPEED-CHANGE DRIVE UNIT	.3			HP
BRUSH MOTOR	0.5			HP
RESISTANCE	3			KW
WATER				
CAPACITY OF THE WASHING TANK 3-4 SECTIONS **	17-25			GL
PRE-WASH CONNECTION	½"			G.
WASH CONNECTION	½"			G.
RINSE CONNECTION	½"			G.
DRAIN CONNECTION	¾"			G.
OVERFLOW	1' ½"			G.
PROCESSING				
MAXIMUM WASHING WIDTH	62			inch
MINIMUM WASHING DIMENSIONS	16 x 4			inch
GLASS THICKNESS	1/32-1/2			inch
SPEED OF FORWARD MOVEMENT	39 –196			lpm
NO. BRUSHES	4			
BRUSH DIAMETER	3 3 /4"			inch
WEIGHTS				
WASHING UNIT WITH FULL TANKS	2425			lb
INPUT ROLLER CONVEYOR	550			lb
/WASHING/ RINSING/ DRYING UNIT	2205			lb
FAN ASSEMBLY	330			lb
ELECTRIC BOARD	88			lb
ENVIRONMENTAL CONDITIONS				
STORAGE TEMPERATURE	32-113			°F
OPERATING TEMPERATURE	113			°F
MODEL	**SM63V**			

ELECTRICAL FEATURES				
GENERAL CONNECTION	See the wiring diagram			
INSTALLED POWER	9			KW
CAPACITY OF THE FAN WITH 15°-760mmHg	545-640			m^3/h
FAN MOTOR	4			KW
NR. 3 WASHING PUMPS	0,38 c/each			KW
SPEED-CHANGE DRIVE UNIT	0,22			KW
BRUSH MOTOR	0,37			KW
RESISTANCE	3			KW
WATER				
CAPACITY OF THE WASHING TANK 3-4 SECTIONS **	65-95			litre
PRE-WASH CONNECTION	½"			G.
WASH CONNECTION	½"			G.
RINSE CONNECTION	½"			G.
DRAIN CONNECTION	¾"			G.
OVERFLOW	1' ½"			G.
PROCESSING				
MAXIMUM WASHING WIDTH	1600			mm
MINIMUM WASHING DIMENSIONS	400x100			mm
GLASS THICKNESS	3-13			mm
SPEED OF FORWARD MOVEMENT	1-5			mpm
NO. BRUSHES	4			
BRUSH DIAMETER	95			mm
WEIGHTS				
WASHING UNIT WITH FULL TANKS	1100			Kg
INPUT ROLLER CONVEYOR	250			Kg
/WASHING/ RINSING/ DRYING UNIT	1000			Kg
FAN ASSEMBLY	150			Kg
ELECTRIC BOARD	40			Kg
ENVIRONMENTAL CONDITIONS				
STORAGE TEMPERATURE	0-45			°C
OPERATING TEMPERATURE	45			°C

1.4. Working position of the operator

During normal production operations, two operators manage the machine: the first operator, close to the loading side, loads the glass lites, while the second operator, close to the unloading side, unloads the washed glass lite
As the machine is equipped with a sensor at the end of the output roller conveyor, which reads the presence of the glass lite and stops the forward movement, even a single operator can manage the processing operation.

All commands are given by using the control panel.



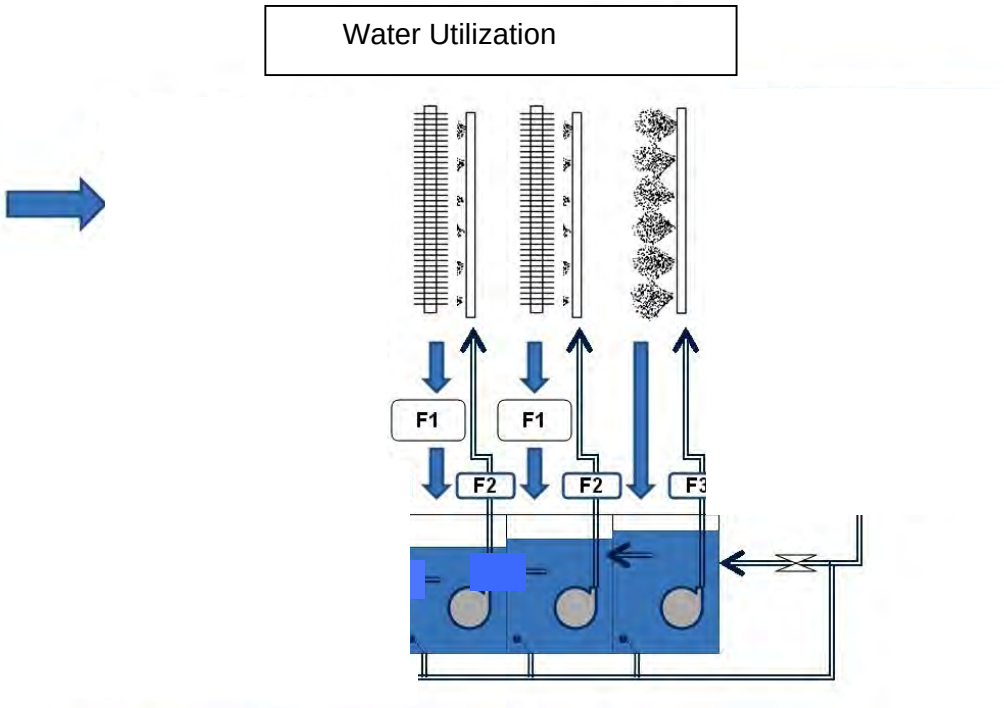
Picture 1 – working positions

Water quality

Water quality is a decisive factor for correct cleaning of the glass. The water being used must have the following minimum features:

Conductivity	**<150µS**	**(microsiemens)**
Salt content	**< 80 mg/l**	
Chlorides	**< 30 mg/l**	
Hardness	**< 6°f**	**(French degrees)**
Iron	**0**	**(absent)**

If the above-mentioned requirements are not met, you must provide for a treated water system to fill tanks in order to achieve ideal performances.



Picture 2 – water circuit 1

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Precautions for use and maintenance

3.1. General notes

	**Before carrying out any operations in the machine, carefully read the whole manual, and pay particular attention to this chapter.**

The machine complies with the provisions of the Machinery Directive 2006/42/EC, by considering the normal use and the reasonably foreseeable use.

For no reason the machine can be used for purposes other than the intended use, nor with modes other than the ones that are specified in the manual.

The different operations will have to be carried out according to the principle and the chronology that are described in this manual.

3.2. Symbols

This manual stresses some operations by using graphic symbols that call the attention of the reader about the danger of the same operations:

	**General safety instruction or warning.**
	**Electrocution hazard or, at any rate, electric-origin hazard.**
	**Hazard of crushing the hands into the rollers.**

	**Hazard of crushing the hands into the transmission components.**
	**Hazard of cutting with the glass.**
	**Slipping hazard.**
	**Noise.**

3.3. Qualification of the operators

3.3.1. Operator that runs the machine

Person that knows the operating modes of the machine and has the following requirements:

1. Training and qualification to run the machine by using the controls, such as:
   - Main power switch of the machine;
   - All different controls to be found in the machine.
2. Training that authorizes operating in compliance with the safety standards according to the hazards that may be caused by the presence of movable parts, fragile materials that are potentially sharp, and live parts;
3. Training about the use of the Personal Protective Equipment and basic first aid interventions.

3.3.2. Mechanical maintenance technician

Qualified technician, who is capable to install, assemble, repair and operate the machine. In addition to the requirements that were listed for a general operator, the mechanical

maintenance technician must have undergone a technical training or, at any rate, a specific training concerning the use and the maintenance of the machine in safe conditions; furthermore, he must be capable of manually operating the machine in case of specific interventions in the mechanical components for performing adjustments, maintenance operations or repairs.

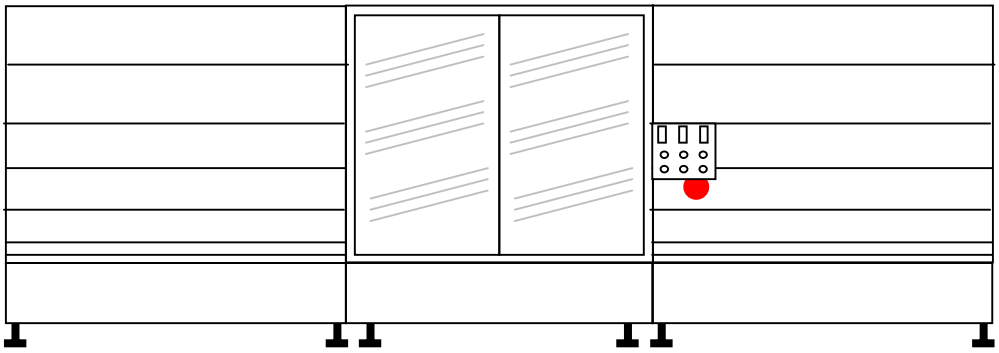
He is not qualified for operating in live electric systems.

3.3.3. Electric maintenance technician

Qualified technician, who is capable to install, assemble, repair and operate the machine; he is capable of performing maintenance interventions in any part within the electric system of the machine.

3.4. Guards and safety systems

Fixed guards protect all areas at risk within the machine (roller conveyors, transmission components, and fans). In addition, there is an emergency switch in the control panel:



Picture 3 – emergency

The electric board is equipped with a lockable master switch.

3.5. Residual risks

“Residual” risks are the risks that could not be eliminated during designing activities; therefore they are potentially present in the machine. The aforesaid risks derive from a specific analysis that was carried out according to the provisions of the Machinery Directive 2006/42/EC. The

documents about the performed analysis are included into the Technical File of the machine kept by the importer.

The horizontal washing machine is characterised by the following residual risks:

	**Slipping on wet floor**
	**Risks connected to noise**

3.6. General warnings

- The machine must be maintained and used according to the instructions that are contained in this Manual and in the importer's in-house procedures, if any.
- Do not expose the machine to the rain and adverse weather.
- Maintenance and operating staff will have to be suitably trained for the use and the maintenance of the equipment in safe conditions.
- The access to the machine for any maintenance operation should be allowed only to specifically trained and specialized staff.
- Any intervention in the machine must be carried out only after having stopped it and disconnected water and power supplies.
- Do not disconnect the safety devices or ignore signals, alarms and warnings, whether they are included in this manual or communicated by means of plates that are permanently affixed to the machine.
- You cannot for any reason modify, tamper with or at any rate change the structure of the machine, the assembled devices, the operating sequence, etc. without the previous authorization by SOMACA/CRL technical managers.
- All routine and extraordinary maintenance operations must be listed in a specific record: you will have to specify the date, the time, the type of operation, the name of the operator and all useful pieces of information.
- The machine must be kept clean. You will have to remove possible waste products.
- At the end of the maintenance operations, you will have to perform a thorough check in order to make sure that you did not forget tools and/or various materials within the operating area of the machine.
- Do not open the electric panel without having previously turned off the machine.
- Do not wash any electric parts, panels, push-button panels and control panels with water.
- The wrenches to open electric panels must be kept in a specific place, and only the authorized staff can use them.

- Do not wear loose and/or flapping clothes, ties, neckerchiefs or other clothes that can get caught and dragged. Chains or necklaces must not be worn around operating equipment. Long hair must be gathered up or netted.

3.7. Personal Protective Equipment

During use and maintenance operations of the machine, you must use the following Personal Protective Equipment (PPE):

Crush-resistant and anti-slip safety shoes

Safety gloves

Noise reduction earphones (recommended – only when the fans are ON)

Mask (when cleaning the rollers with alcohol)

3.8. Emergency interventions

The following pieces of information are general.

3.8.1. First-aid interventions

In case of possible first-aid interventions, comply with corporate standards and traditional procedures.

3.8.2. Fire-prevention methods

- Do not use water to extinguish fires that involve electric components, but only carbon-dioxide or powder extinguishers.
- When heated, or in case of fire, some products may release toxic fumes into the atmosphere. During the fire quenching process, always use a breathing apparatus.

Transport and handling

Transport and lifting operations should be carried out exclusively by specialized staff.

For transport purposes, the machine is disassembled into its different sections (input, washing-rinsing-drying, output, fan assembly, and electric board). Each section can be lifted by using a fork lift truck.

The minimum distance between truck forks equals 39” (1000 mm)

4.1.1. The weights of the individual sections are listed in chap. 1.3.12 “Emission of airborne noise

4.1.2.

The machine or its parts must be shipped and stored in places that are sheltered against weather elements.

Do not stack other cases, parcels or materials on top of the machine or its parts.

Installation

5.1. Checks at receipt

When receiving the machine, check what follows:

- The packages must be intact;
- Absence of damages (dents, scratches, deformations, breaks);
- The name plate must be intact.

5.2. Preparation

The machine does not need foundation works.

You should provide for a sufficient space before and after the machine in order to load and upload the glass plates, as well as a minimum 39” (1meter) passageway on the sides.

5.3. Assembly and installation

SOMACA/CRL refuses all responsibilities for damages or injuries caused by assembly and/or installation operations carried out by non-authorized staff.

5.4. Electric connection

Only specialized staff can perform these operations.

Before performing the connection, make sure that:

- **The data concerning the power supply line comply with the required data (see chap. 1.3.1) tEmission of** airborne noise

The electric line is provided with an automatic release system (differential circuit-breaker) before the master switch of the machine, and a suitable earth ground system;

- **Power supply cables are correctly dimensioned according to machine total load requirements.**

a) Check that the line differential circuit-breaker and the master switch of the machine are in the OFF position

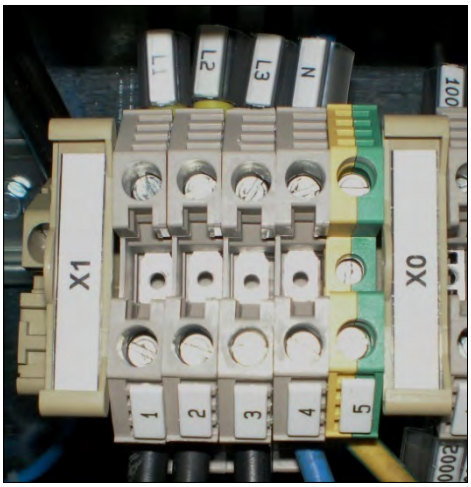
b) Open the electric board;

c) Pass the power supply cord through the power inlet (Picture 4 – power inlet);

d) Connect the power supply to the terminals (Picture 5 – terminal board)

e) Close the electric board.

Picture 4 – power inlet



Picture 6 – terminal board

After having finished the electric connection, start the machine and check the correct direction of rotation of the motors. If the rotation is not correct, reverse two out of the three power supply phases.

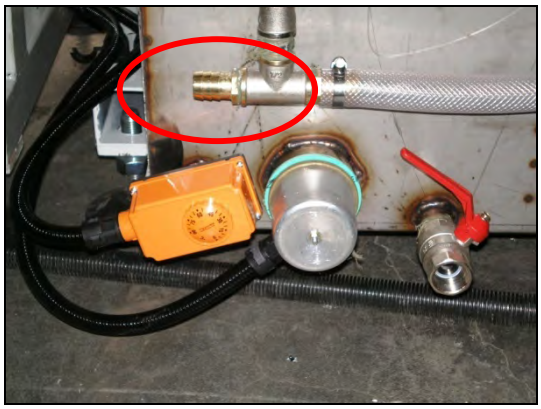
5.5. Water connection

It is absolutely necessary that the water supply system is equipped, before the machine, with a anti siphon valve in order to separate the system from the machine.

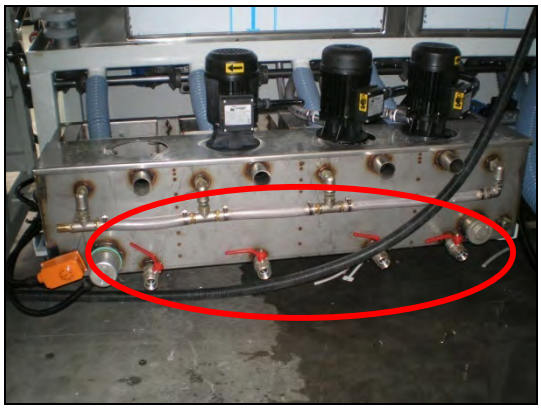
Supply and drain pipes must be connected to the recirculating tanks fittings.

Connect the supply pipe that comes from the network to the ½" G union of the circuit (Picture 8 – drain valves).

Connect tank drains (Picture 8 – drain valves) to a previously prepared connectionwell.



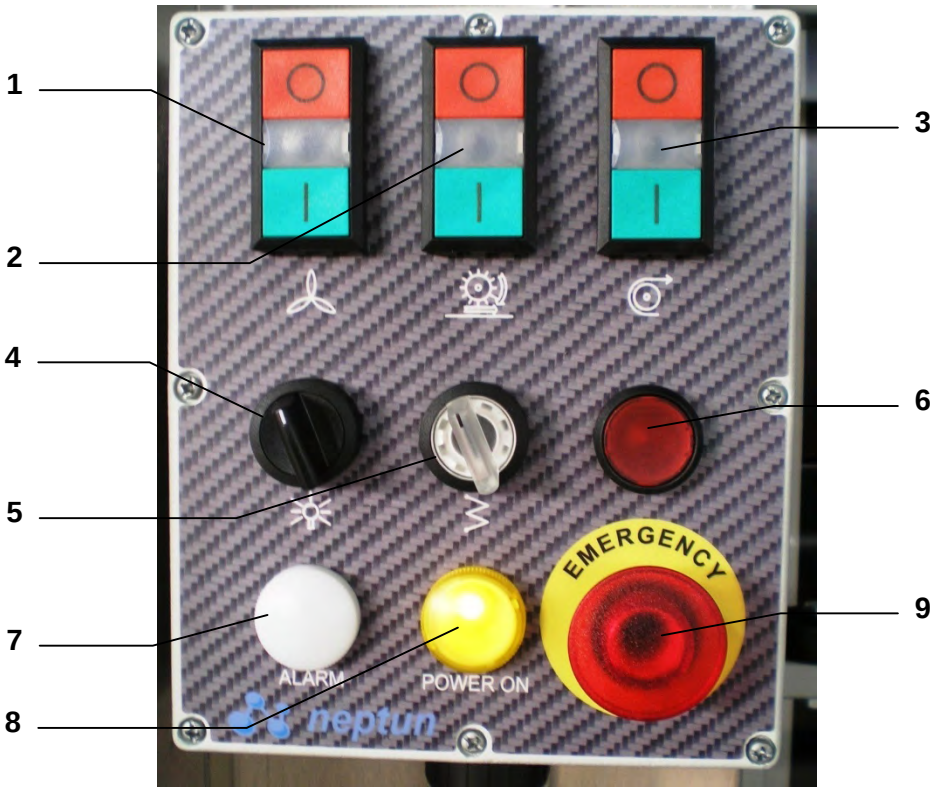
Picture 7 – water supply



Picture 8 – drain valves

How to use the machine

6.1. Control panel



Picture 9 – control panel

1. Drying start/stop
2. Brushes start/stop
3. Drive start/stop
4. On/off unloading inspection lights
5. On/off water heater
6. Manual conveyor drive
7. Alarm Indicator
8. Power indicator
9. Emergencystop switch

6.2. Adjustments

Water temperature

Water temperature should never exceed 40°C/104°F

(Picture 10 – thermostat

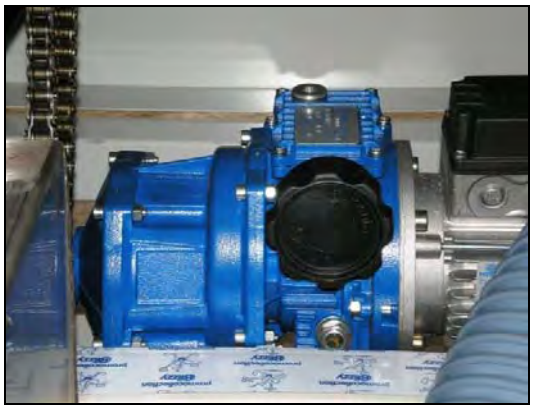
Picture 10 – thermostat

Conveyor speed

The adjustment must be carried out when the drive is operating. Adjust the specific hand wheel that is installed in the speed-change drive unit (Picture 11 – speed-change drive unit

The speed must be adjusted according to the size of the glass plates, so that the plate at the

Output is completely dry



Picture 11 – speed-change drive unit

6.3. First start-up

The purpose of this operation is to prevent the water heating elements from burning.

a) Open the water supply valve and wait until the tanks have filled.

b) Operate washer with an empty conveyor.

6.4. Start-up

a) Check that all water supply valves installed before the machine are open;

b) Connect the power supply (line differential circuit-breaker and master switch of the machine in the ON position);

c) Start the heating of the washing water (Picture 12 – , part 1);

d) Wait 10 - 15 minutes to allow the water to reach the pre-established temperature;

e) Start the drying fans (part 2) and wait until they are fully operational;

f) Start the brushes (part 3) and the drive (part 4)

Picture 12 – start-up

6.5. Operation

During the normal operation, two operators manage the machine for glass lites loading and unloading respectively.

Glass lites loading and unloading operations are performed in a manual way.

The machine is equipped with a sensor that stops the drive when the plate reaches the end of the output roller conveyor; however, the intrinsic cutting risk remains, as it is connected to glass plate handling.

The glass lites must be loaded onto the roller conveyor at a minimum separation distance of 3/16” (5 cm) one to the other, to prevent the risk of overlapping.

6.6. Stop

a) Stop the fans, the brushes and the drive (Picture 13 – , part 1, 2, 3);

b) Trun off water heater (part 4).

6.7. How to turn off the machine

a) Set the master switch to the OFF position;

b) Close the water supply valve.

Picture 13 – turn off

6.8. Emergency stop

The emergency stop can be achieved by pressing the specific red button (Picture 3 – emergency

, Picture 9 – control panel

part 9). All machine functions will immediately stop.

To restart the machine after an emergency stop:

a) Remove the cause of the emergency;

b) Release the emergency button by rotating it in counter clockwise direction;

c) Restart the motors.

Maintenance

All maintenance operations, unless specified otherwise, must be carried out with stopped machine and disconnected power supply.

7.1. Daily maintenance

At the end of the day:

a) Drain the washing water by opening the specific valves;

b) Clean the inside of the tank by using a water jet;

c) Close the draining valves, open the loading valves and wait until the tank has filled in;

d) Start the machine and run it for a few minutes in an unloaded condition in order to clean the brushes;

e) Turn off the machine, and then close the water supply;

f) Clean the outside of the machine by using a wet cloth.

7.2. Scheduled maintenance

A maintenance technician must perform these operations

EVERY 40 HOURS

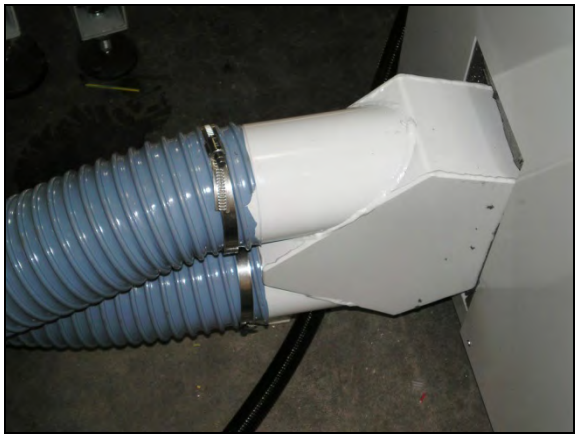
Cleaning of driving rollers

Wear gloves and a protective mask

Use a clean cloth and alcohol. Clean input and output rollers.

Every 500 hours

How to check fan pipes: check that the flexible pipes have no cuts or damages, and then check the tightening of the clamps. (Picture14 – fan pipes)



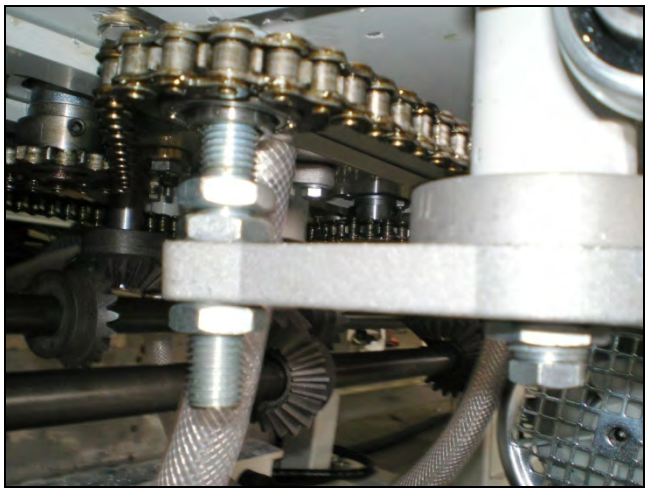
Picture 14 – fan pipes

How to check chain tension and lubricate: remove the front protective guard (Picture 15 – front guard), and then lubricate the chains and the pinions with silicone grease.

Check chain tension; if necessary, adjust it by means of the specific tighteners (Picture 16 – chains and tensioners

)

Picture 15 – front guard

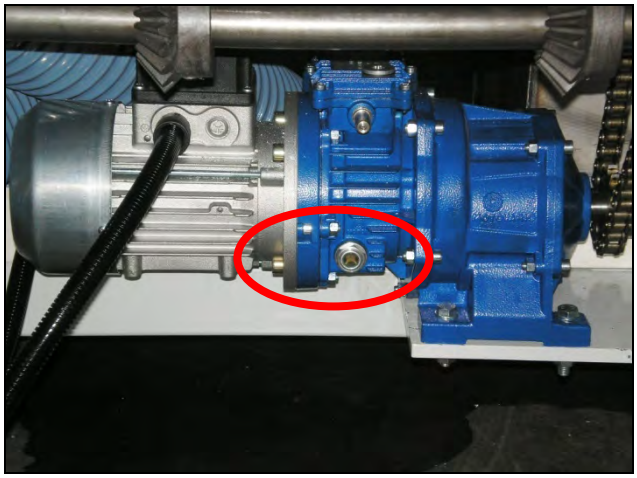


Picture 16 – chains and tensioners

How to check the washing pipes: check that the holes of the washing pipes are not clogged, in case free them by using a steel tip.

How to check the oil in the speed-change drive unit: check the oil level by means of the specific indicator (Picture 17 – speed-change drive unit

), if necessary, add new oil. Oil type is specified in the plate of the speed-change drive unit.



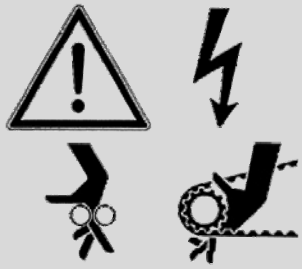
Picture 17 – speed-change drive unit

The following table summarizes scheduled maintenance interventions.

Operation	Frequency
Cleaning of driving rollers	Every 40 hours
Check of fan pipes	Every 500 hours
Check of chain tightening and greasing	
Check of washing pipes	
Check of the oil in the speed-change drive unit	

7.3. Maintenance interventions

The following maintenance interventions cannot be scheduled; they must be carried out whenever necessary, according to the wear and tear of the involved parts.



A maintenance technician must perform these interventions with stopped machine and disconnected power supply

How to replace the brushes:

a) remove the front protective guard of the washing section (Picture 15 – front guard);

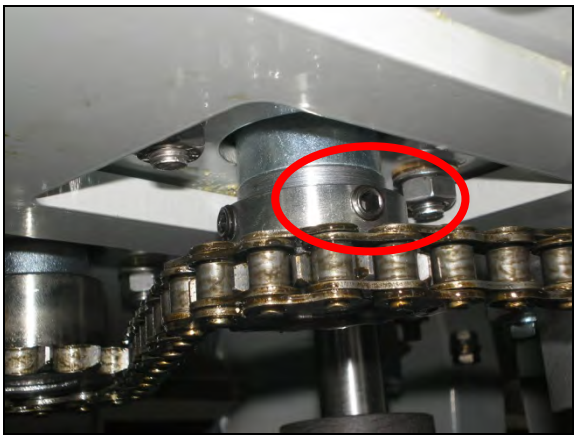
b) loosen the chain tightener (Picture 23 – chains and tighteners on the left);

c) open the doors and remove the transparent protection of the brush by loosening the knobs (Picture 18 – brush protection);

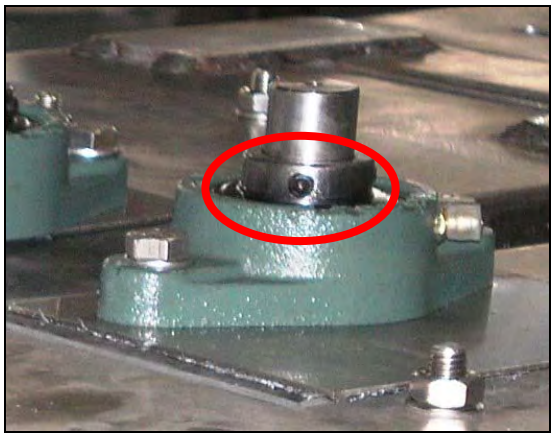
d) loosen the security set screws of the brush pinion (Picture 20 – brush bearings), and then remove the pinion;

Picture 18 – brush protections

e) loosen the screw screws of the upper brush bearing (Picture 20 – brush bearings);



Picture 19 – pinion l



Picture 20 – brush bearings

f) remove the brush by moving it at first upwards, and then downwards; after that, pull it outwards;

g) install the new brush, and then repeat the entire procedure in reverse order.

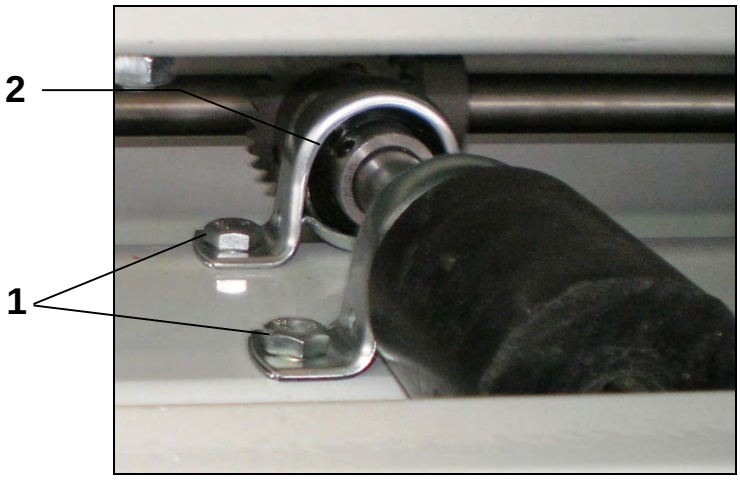
How to replace a roller:

a) unscrew the bearing fasteners (Picture 21 – roller

b) , part 1) and then remove the bearing brackets and the roller;

c) loosen the pinion set screws (part 2), remove the pinion, and then introduce it into the new roller; after that, tighten the set screw;

d) position the new roller, re-position the brackets and tighten the fastening screws.



Picture 21 – roller

How to replace fan filters:

Remove the filter from the top (Picture 22 – air filter

), and then replace the filtering sheet. As for the specification of the filtering material, refer to the list of spare parts.

Picture 22 – air filter

7.4. Record of maintenance interventions

If there is no specific form, it is advisable to use this section to note down the maintenance interventions performed in the machine.

Date of maint. intervention: .....
Description:.....
.....
.....
.....
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Date of maint. intervention: .....
Description:.....
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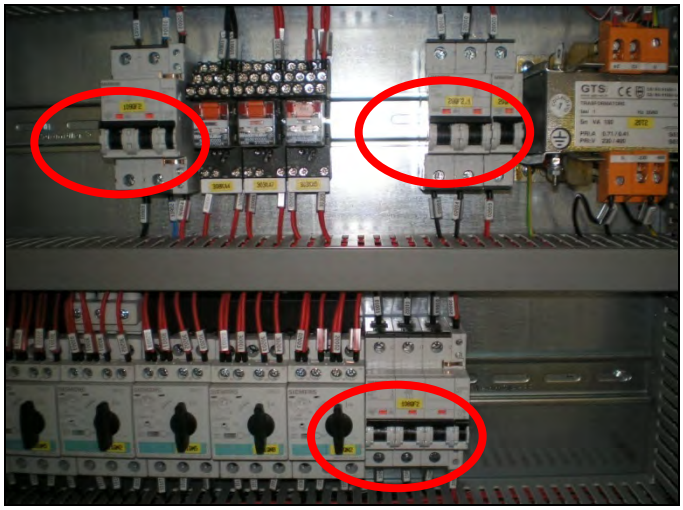
Troubleshooting

Trouble	Intervention
Water is not in the tank	Check that the shutter valve installed before the machine is open. Check that the drains are closed
The motors do not start	Check that the emergency button is not initiated and that the power supply indicator is ON
The glass keeps dirty	Check that the rinsing valve is open. Check that the water delivery valve is open. Check water hardness. Check if the washing water is clean: if necessary, replace it. Check the brushes: if necessary, replace them. Check for plugged spray nozzles.
The glass plate keeps inside the machine	Open the doors of the drying area, and then manually remove the glass plate
Drying is insufficient	Check if the filter on the fans inlet is clogged. Check the correct connection of air pipes. In case, reduce the driving speed
The thermal overload protection of a motor has activated	Identify and remove the cause of overload, restore the protection (Picture 27), and then restart the motor. If the problem occurs again, call SOMACA/CRL assistance service.



Picture 23 – motor protections

Decommissioning and disassembly

9.1. Instruction

The disposal of toxic and/or harmful waste, such as for example chemical compounds, is subject to specific standards according to the Country of belonging. Before performing any operation of this type, you must become acquainted with the aforesaid standards at the competent authorities over the territory. In order to disassemble the machine, it is advisable to ask the Manufacturer and to make use of only staff that is suitably specialized for this type of operations. In case, call firms that are specialized in this type of activity.

9.2. Decommissioning

If you provide for that the equipment will not be used for an extended period, you will have to comply with the following rules:

- Perform daily maintenance operations (chap. 7.1) and make sure that the washing tank is empty;
- Grease the chains;
- Disconnect water and power supplies;
- Cover the machine with a sheet.
- Store machine where it will not be effected by weather or floooding.

9.3. Disassembly

Machine components do not include any toxic or harmful parts.

Perform the disassembly operation by removing the individual parts; the aforesaid parts will have to be differentiated according to the type of the forming materials, and then disposed of in compliance with the regulations in force in the Country where the machine is installed.

Diagrams and attached documents

The following documents are attached to this manual:

- Wiring diagram
- Hydraulic diagram
- List of spare parts