USER AND MAINTENANCE HANDBOOK

LAMINATOR L150A

SERIAL NUMBER:

GENERAL INDEX

1. GENERAL INFORMATION

1.1. GENERAL INSTRUCTION

- Questo This manual describes the correct way to use the laminator L150A for photovoltaic panels with maximum dimension 1500x1000mm, made and sold from this company:

P.ENERGY SRL

Via dell'artigianato, 12 – 35014 Fontaniva (PD) – ITALY

Phone: +39 (0)49 79 66 190

Fax: +39 (0)49 79 68 776

Web Site: www.penergy.it

e-mail: info@penergy.it

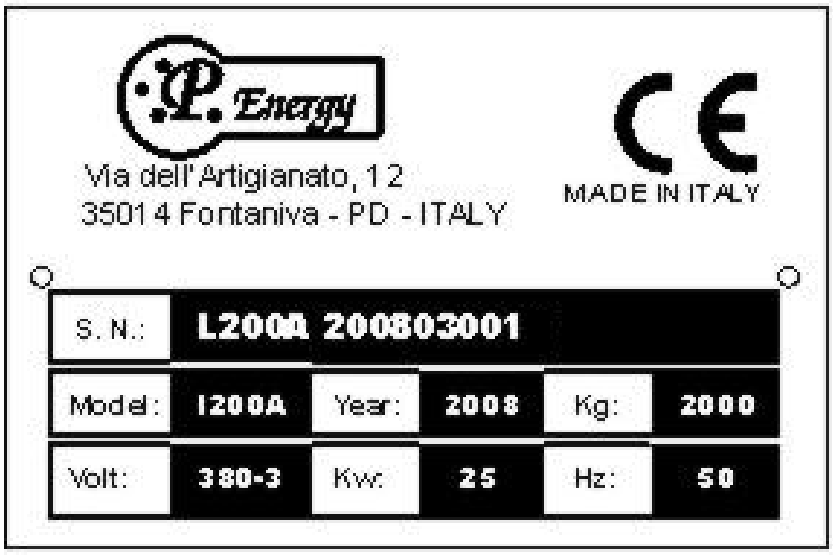
- THIS MANUAL IS PART OF THIS MACHINE AND CONTAIN ALL NECESSARY INFORMATION CONCERNING USE AND MAINTENANCE.
- IF YOU DON'T PAY ATTENTION TO INSTRUCTION AND RACCOMANDATION OF THIS MANUAL THE GUARANTEE IS NOT ACTIVE
- IT'S PERMITTED TO USE THE MACHINE ONLY TO WELL-TRAINED OPERATORS.
- THE OPERATOR HAS TO READ CAREFULLY THIS MANUAL BEFORE TO INSTALLATION AND START-UP.
- The Manufacturer reserves to suspend the production of some machine model, to modify characteristic and drawings without obligation advice.

1.2. SERIAL NUMBER

In order to identify the laminator it's necessary to recognize the following specification data plate fixed on side machine.

Data on CE identification plate

Example:



1.3. GENERAL DESCRIPTION OF MACHINE COMPONENTS

The laminator is a machine controlled from an operator that laminate together all material introduced inside. Through a program is it possible to control the parameters like temperature level, the vacuum and the working time.

The laminator is mainly composed of two parts: An aluminum plate is heated through a series of electric resistances or cooled through an hydraulic circuit according to set up parameters and by an hermetic shifting cover.

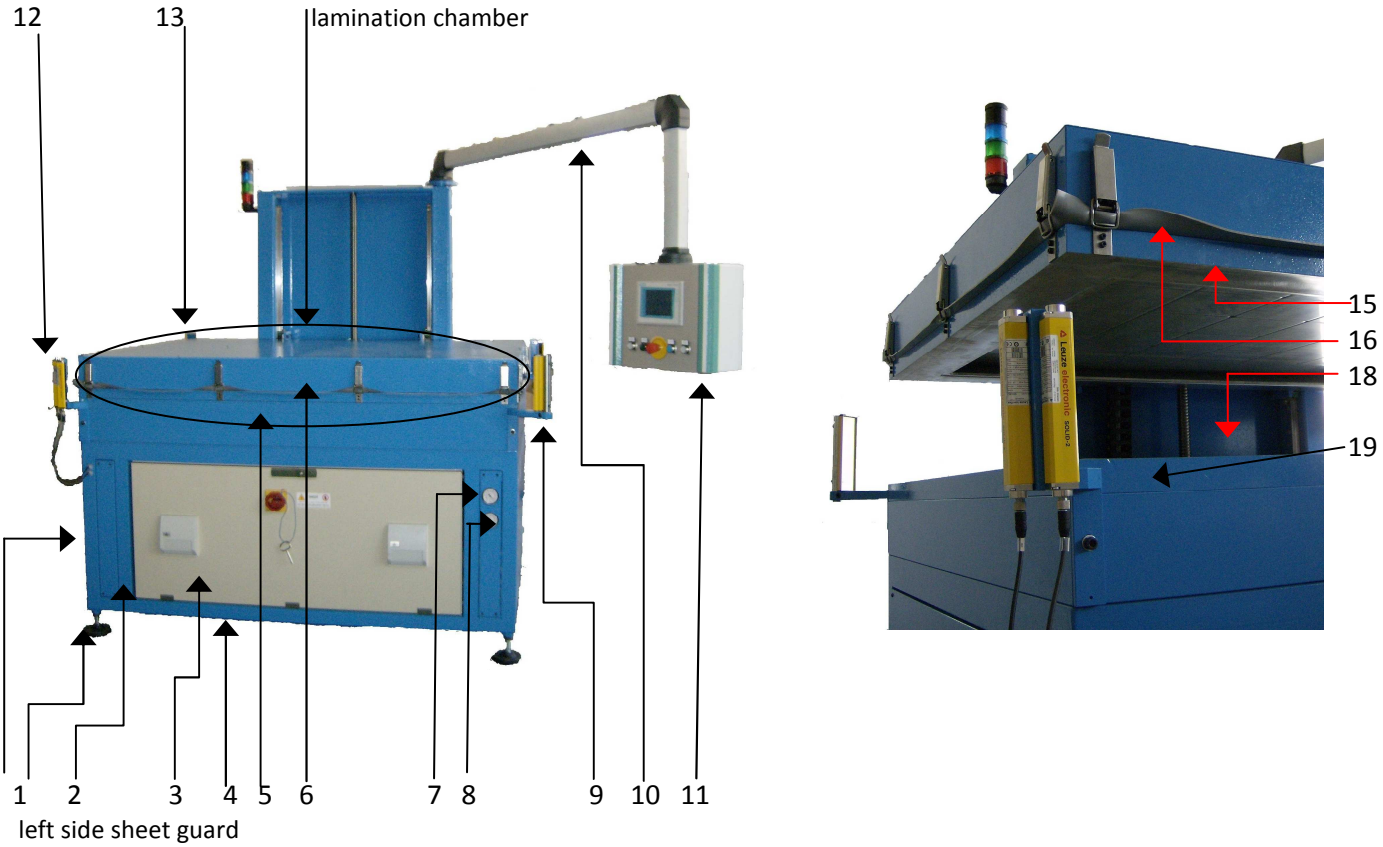
The electrical cabinet is fixed in front of machine and inside the frame is positioned the pneumatic circuit, protected by sheet guard, included the vacuum pump and hydraulic circuit.

On the back side there are the electrical, pneumatic, hydraulic feeding.

The area inside the cover is protected by two light barriers fixed on the corner of the aluminium plate .

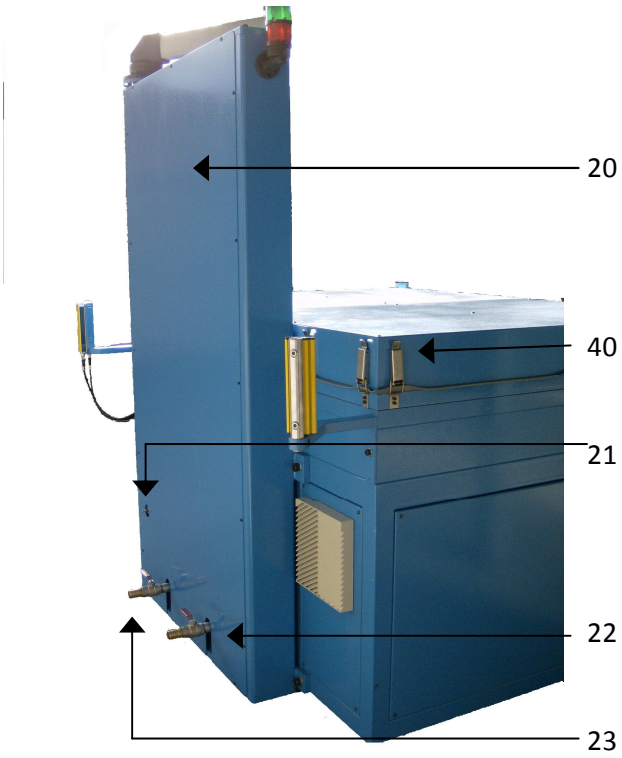
The laminator is controlled by LCD keyboard supported through a mobile arm.

View of Laminator component

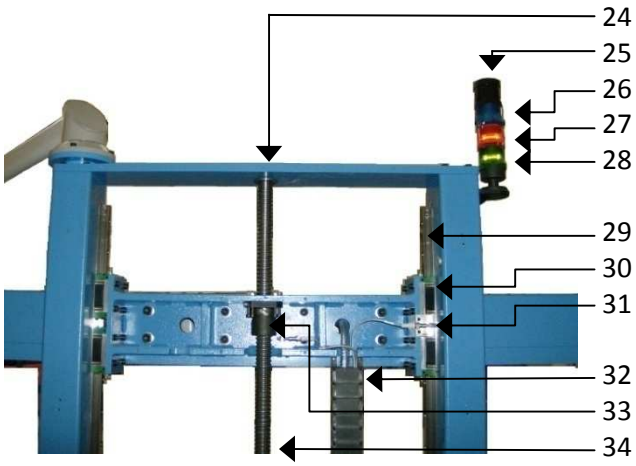


Pos	Description
1	Adjustable feet
2	left front side sheet guard
3	electrical cabinet
4	Lamiantor frame
5	Base machine
6	laminator cover
7	cover vacuum gauge
8	plate vacuum gauge
9	Light barrier mirror on the right front side
10	Mobile arm of operator panel on left front side

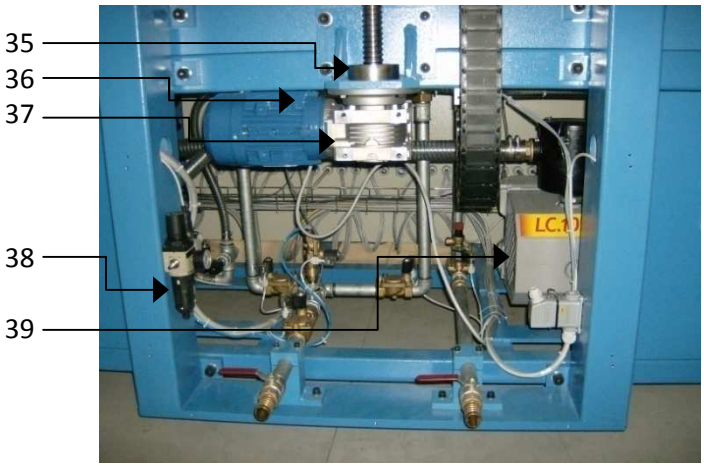
Pos	Description
11	electrical pannel
12	Light barrier sender on right front side
13	Light barrier mirror on the left back side
15	Membrane frame
16	Membrane
18	heating plate
19	plate frame



Back view without cover

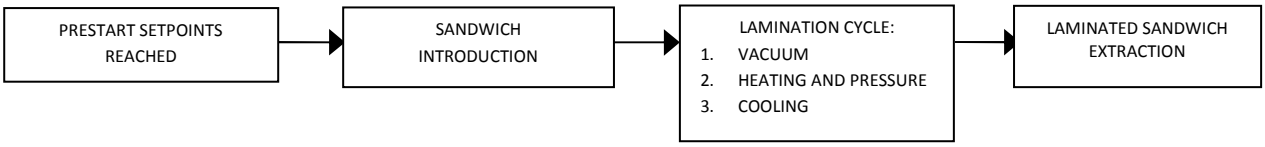


Pos	Description
20	Column cover
21	inlet pneumatic feeding
22	hydraulic circuit outlet
23	inlet hydraulic circuit
24	upper bearing for ball bearing screw
25	Siren
26	Blu lamp
27	Red Lamp
28	Green lamp
29	sectional guide
30	Slide
31	upper point limit switch
32	Cable carrier chain system
33	ball bearing nut
34	ball bearing screw
35	lower bearing connection of ball bearing screw
36	cover el. motor
37	reduction gear of cover electrical motor
38	pneumatic pression regulator
39	vacuum pump
40	Hook



LENGHT=1900mm	WITH=2100mm	HIGHT=2200mm	WEIGHT=2000Kg

1.4. GENERAL DESCRIPTION OF LAMINATION PROCESS



DESCRIPTION OF WORKING CYCLES:

1.PRESTART SETPOINT REACHED

The starting parameter are reached in automatic mode according to setting recipe and the end phase is diplayed by signal lamp

2.SANDWICH INTRODUCTION

Operator introduce in manual mode the sandwich

3.LAMINATION CYCLE

The automatic lamination cycle start when the operator push the two hand pushbutton and the cover move to the close position before the beginning of lamination process.

Following inside the hermetic chamber between cover and plate the vacuum is reached in order to remove the air residue between the sandwitch, after a membrane lower and exert uniform pressure over the panel.

Simultaneously a constant temperature is maintained for a programmed time in order to join the component

Next step is cooling the plate by an hydraulic circuit and to reset the pressure value inside the laminator chamber.

All parameter are edited by the operator panel

4.LAMINATED SANDWICH EXRACTION

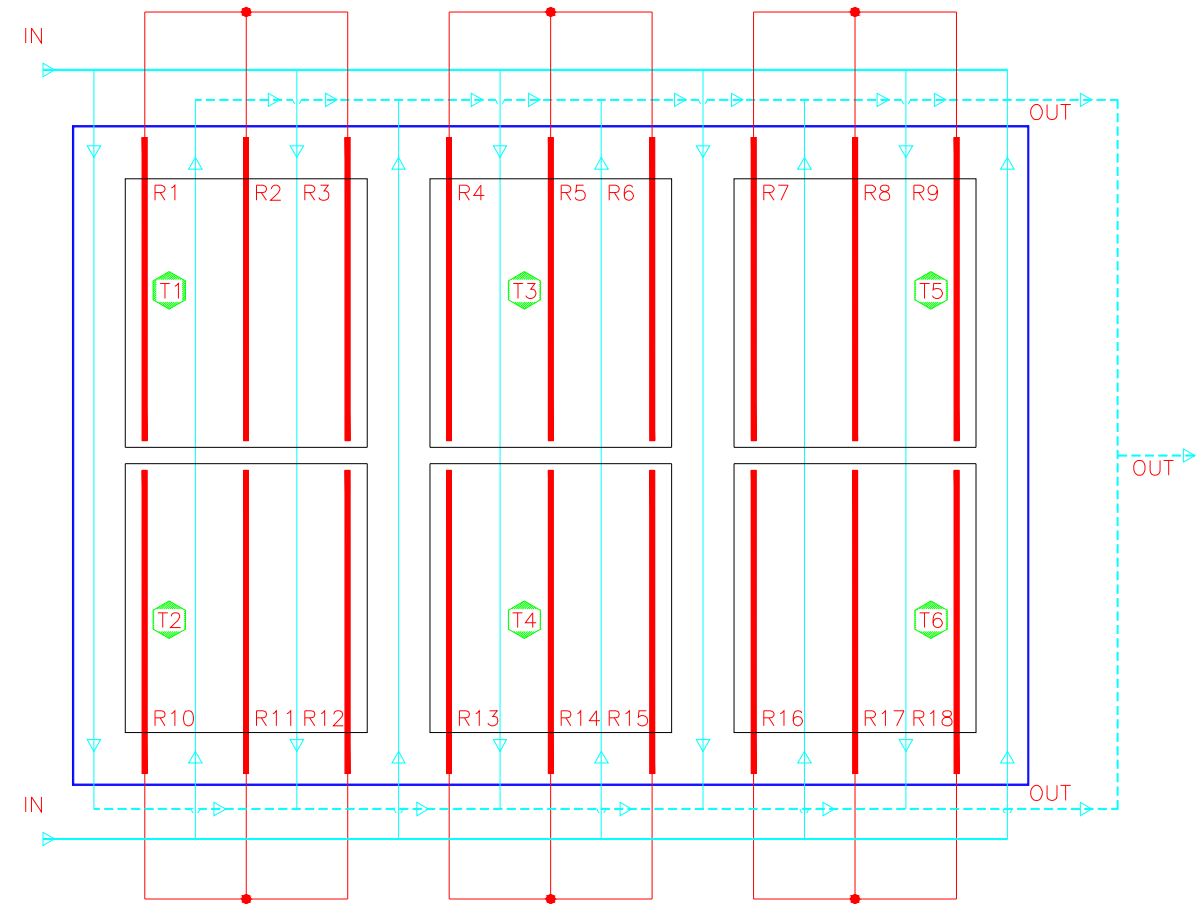
At the end of recipe the cover move in automatic mode to the upper point and the laminated panel is removed.

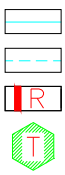
NOTE: In order to adjust the temperature inside the laminator chamber the heating plate is divided in 6 areas with 3 heating resistor and 1 thermocouple probe per area.

The heating plate is even cooling by a dedicated circuit.

Follow the plate layout:

CIRCUIT ON HEATING PLATE





Coolin circuit in
Coolin circuit out
Resistor
Thermocouples

1.5. INTENDED USE OF THE MACHINE

The P.ENERGY L150A laminator is designed only to be used to with maximum dimension panel 1500x1000mm.

The maximum thickness is 40mm.

The P.ENERGY L150A laminator work with Standard/FAST/Ultra fast cure EVA

P. Energy suggest to work with the follow raw materials:

glass: LIPIK GLASS ULTRALIGHT

lamianted: TEDLAR CTE COVEME

cells: GINTECH 4'',5'',6''

eva: STANDARD/FAST/ULTRAFAST CURE ETIMEX

the laminator in your possession has been designed such a way that's operated by a single operator who shares the cycle of work and visions successful.
The technical specifications such as: worked hours, Quantity of Production, and type of finished products are specified at the time of the bid.

1.6. WARRANTY

The warranty refers to the contractual terms agreed with the customer, in any case:

THE WARRANTY STOP IF:

- Manual instructions are not respected
- There will be modifications without authorization
- Programmed maintenance is not followed
- The machine will be used from a different purpose from that designed
- The machine will be done from not licensed people

2. SAFETY

2.1. INTRODUCTION

It is forbidden to use the machine for reasons other than that describe above, and/or by person who are not suitably trained.

2.2. GENERAL SAFETY RULES:

1. Always keep clean and tidy the work area
2. Do not leave tools or spanners on the machine, or near to it. After any maintenance work or the replacement of accessories, check carefully, before switching on the machine.
3. Always be sure that you are in a safe position with respect to the machine in a secure, well-balanced position.
4. Never leave the machine unsupervised
5. All the operations of normal or special maintenance carried out on the machine, as well as cleaning ad running the machine must only be undertaken by trained personnel
6. Any normal or special maintenance work must only take place with the machine stopped and electrical supply cut off, the pneumatic and hydraulic plant must only be carried when the pressure has been released from the equipment
7. Before each work shift, ensure that the safety system operate correctly
8. The working place have to be protected from atmospheric conditions

2.3. MACHINE CONNECTIONS:

It is responsibility of the client to set up the electrical and pneumatic supply system of a suitable size to withstand small power surges of the laminator, see data sheet present on the SUPPORTING DOCUMENTS
The electrical and pneumatic supply system to be connected to the plant must only be carried out by qualified personnel, and carried out according to general regulations for electrical plant installation

2.4. GROUNDING SYSTEM

It is responsibility of the client must be connected to an efficient grounding system

2.5. MACHINE SAFETY SYSTEM

- MECHANICAL

a) Protective panel in painted sheet metal, protecting the electrical and pneumatic plant
b) Protective panel in painted sheet metal, protecting the danger area
c) The cover movement is controlled by a sensor maximum openness and a sensor minimal.
d) The access door to the electrical panel is fitted with a main switch for the main machine electrical power supply. This is of the type that can be padlocked and is fitted with mechanical lock, which does not allow the electrical cabinet to be opened unless the switch is at the "0" position.
e) The speed of descent and ascent of the cover is sufficiently slow so that the operator has the time to evaluate the potential risk.
f) The laminator is designed to be used by a single operator to operate the movement of the cover must use the special command with two hands.

- ELECTRICAL

a) All perimeter of laminator is protected by an infrared barrier that blocking the cover movement in case of introductions.
b) The electrical circuit is protected by thermal-magnetic circuit breaker and fuse

- TOWER SIGNAL LAMP:

- Red lamp: danger
-Green lamp: fixed lamp =automatic cycle; Blinking lamp = pre-start conditions reached.
-Blue lamp: cooling circuit activated

- SIREN, it signals with an acoustic signal, the alarm presence (fixed sound), and the cover movement (Intermittent sound)

2.6. IDENTIFYING THE ZONES OF RESIDUAL RISK NEAR THE MACHINE

the area along the entire perimeter of the laminator to a width of 1 meter can be a source of hazard for the operator if the rules of behavior are not respected and if the operator fails adequately monitor the working area

3. INSTALLATION

3.1. INTRODUCTION

The laminator is delivered to the customer as agreed upon contract.
Before proceeding to the positioning of the machine, check the general status and the correspondence as described on the transport document

IMPORTANT: FOR EVERY PROBLEM RISCONTRATO CONTACT IMMEDIATELY THE MANUFACTURER

3.2. FOUNDATIONS

The laminator must stand an a solid, well leveled floor.
The client must check load bearing capacity (especially if on raised floors), and that the fixing used for the foundation fixing bolts of good quality.

3.3. EQUIPMENT FOR LIFTING AND TRASPORTING

It is the responsibility of the client to obtain all the equipment necessary for lifting and moving the laminator.
We recommend that the movement are make by a lift trucks, following this instructions.

a) Use a right lift truck has a load capacity suitable for the weight of the machine to be moved
b) The forks lift truck 's extensioned clamp must have the same length of the machine
c) Place the forklift truck 's extensioned clamp between the base and the Adjustable feet
d) Move the machine to the place of installation, taking care to fix the Mobile arm of operator panel
e) If the machine must work in line with other production plant, it is important to make sure it is positioned correctly in line with the line
f) Check the level of the machine on the various sides

NOTE: The operations of lifting and moving the laminator must be carried only by allocated personnel who have been suitably trained in the operations of lifting and moving the machine.

3.1. ELECTRICAL CONNECTIONS

All electrical connections must be provided by trained personnel.

Electrical specification: The right values are showed on the CE laminator plate
Rated Power: The value is showed on the CE laminator plate
Feeder cable: The electrical connection with machine have to be done with a suitable cable (minimum cross section 4x6mm^2 with a maximum length of 20 mt)

Connecting place: - Connect the machine main switch to the power supply network through the cable gland behind the electric cabinet (see the electric scheme).
In order to connect the machine it's necessary to remove the side casing and the column cover.

3.2. PNEUMATIC CONNECTIONS

All pneumatic connections must be provided by trained personnel.
Min and Max working Pressure: The working pressure is reported on the pneumatic scheme (Pmax=8bar; Pworking 6bar)

Air consuming: 60l/min
Pipe type: Pneumatic connection must be done based on norm with a suitable pipe section

Connecting place: the connection is made through the rear side input by a prepared hole on the column cover, (see position n. 21 of laminator components view)

3.3. HYDRAULIC CONNECTIONS

The Hydraulic connections must be provided by trained personnel.
Water consuming: 10 l/min (only if cooling is used)
Note: the water temperature influence the cooling cycle, check that the temperature input is suitable to the working cycle
Pipe type: Hydraulic connection must be done based on norm with a suitable pipe section.

Connecting place: the connection is made through the rear side input by prepared connection, (see position n.r 22 and 23 of the view of laminator components view)

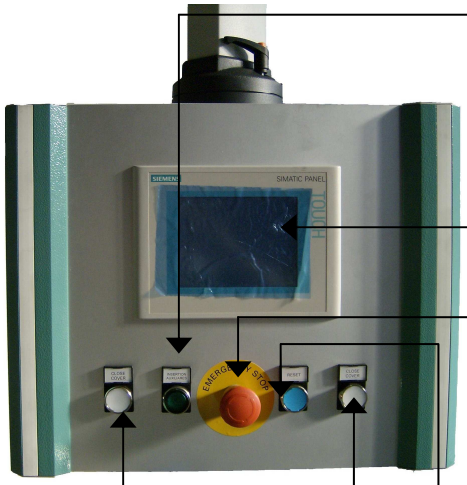
3.7. LAMINATOR START UP

BEFORE TURN ON THE LAMIANTOR IT'S NECCESARY TO KNOW THE CONTROL PANEL :
IN THE FOLLOW ORDER IT WILL BE DESCRIBED:

1- **PUSH OPERATOR PANEL BUTTONS**
2- **TOUCH SCREEN PAGES**
3- **LAMINATOR START UP**

3.7.1.- Description of push operator panel buttons:

LAMIANTOR IS CONTROLED BY A OPERATOR PANEL FASTEN TO A ADJASTUBLE ARM



Auxiliary push button This push button turn on the auxiliary circuit after a emergency stop or during the laminator turn on
Touch screen panel
Emergency push button; This push button stop immediately the machine and cut off power
Silent siren
Two hand push button control of laminator closing cover, It's necessary to push simultaneously the two hand push buttons to move the cover otherwise with only one pushed the cover stop

3.7.2-Touch screen Panel:

Touch screen allows to setup, monitor and edit the values of controller parameters, to monitor and manage alarms, manage recipes and command directly the output.

- The display is used as input device for interacting with the display's field, removing the keyboard and the mouse.

-The numeric input data are edited according to following procedure:

1.Touch the input data field (after a keyboard touch will appear)

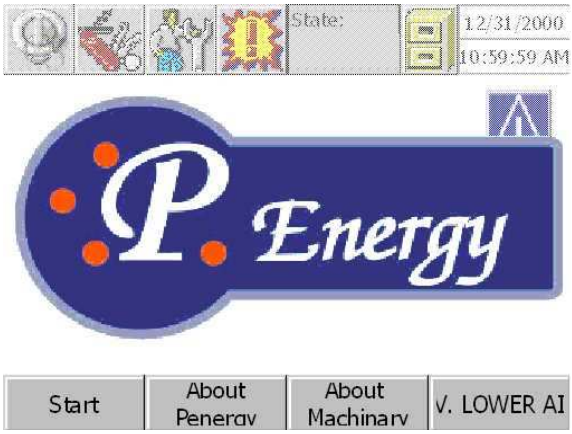
2.Edit the value by the keyboard touch

3.Confirm the value with the Enter button

4.The keyboard will disappears and the input value is stored in the PLC memory

HOMEPAGE TOUCHSCREEN

It's automatic loaded at start up



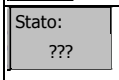
In the bottom of screen there are the "START", "P.Energy details" and "About Machinery" pushbuttons that allow access to general information concerning manufacturer and machine type.All pages have in common the same top menu bar that allow access to the laminator control pages

CYCLE PUSHBUTTON: This page contains all working parameters, as actual recipe step, plate temperature, upper and lower vacuum chamber value. In this page the operator starts the working cycle in automatic mode by the start cycle pushbutton. The cycle page contains a PLATE TEMPERATURE submenu where it's possible to monitor the actual plate temperature detected through the temperature probes in order to verify the temperature uniformity and the possible breaking of resistance.

PARAMETER PUSHBUTTON: This page contains the machine parameters essential in working mode. Every parameters modification/adjustment should be performed by very skilled technician.

MANUAL MODE PUSHBUTTON: In this page it's possible to command in manual mode all the laminator functionality and verify the working status. The manual commands are free without restrictions and not associated with the working mode. It's possible to test the follow laminator functionality:
1 Testing of vacuum circuit by the VACUUM COMAND submenu
2 Testing of heat resistance by setting temperature on HEAT. COMAND submenu
3 Opening/closing the cover in manual mode, enable/disable the cooling system, drain of water cooling circuit by the GENERAL COMAND submenu.

ALLARMS: This page contains details regarding the possible alarms and the reset command

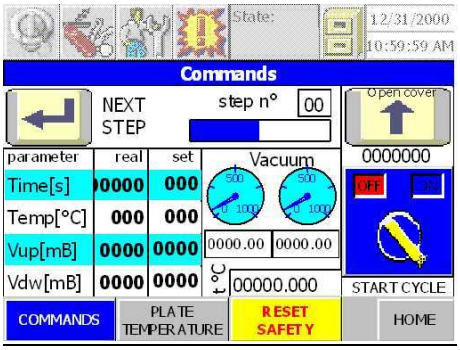
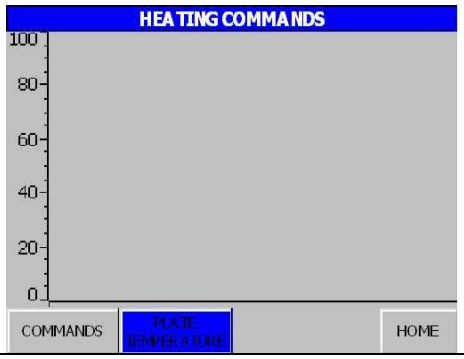


It shows the machine operating status: prestart, manual o automatic mode

Recipe: It contains all parameter concerning the working recipe used when the automatic cycle start

CYCLE PAGE

The cycle page is divided in two submenu:
COMMANDS AND TEMPERATURE PLATE

NEXT STEP:This pushbutton force to next recipe step STEP N°:Info field where is showed the current recipe step START CYCLE:Automatic start cycle pushbutton Working parameter concerning the current recipe step. Parameters are divided into two columns: 1- Real: it corresponds to measuring real value 2- Set: it correspond to the setpoint value expected to have reached within a set window time. The operator can modify this value but this modify work only in the actual recipe step and only for the current lamination cycle. It's not possible to save the new value in the recipe. Description of parameters that appears: Time: time duration of recipe step Vup: Upper chamber vacuum value Vdw: Lower chamber vacuum value Reset Safety: reset the safety Beams, when the button is yellow	"COMMAND " PAGE: 
This monitoring page shows for each resistance the temperature graph and the temperature plate settled in the recipe	"HEATING COMMANDS" PAGE 

PARAMETERS PAGE

Every parameters modification/adjustment should be performed by very skilled technician. It's advisable to keep a backup copy of the manufacturer value.
The parameters page consists of 4 submenu:
PARAMETERS, VACUUM PARAMETER, TEMEPERATURE PARAMETERS, GENERAL

HOURS N°: N° working hours

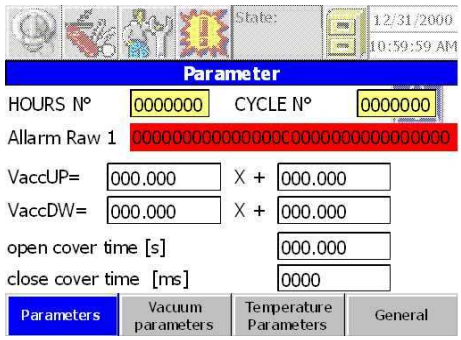
CYCLE N°: N° lamination cycles done

ALLARM RAW: Alarms view

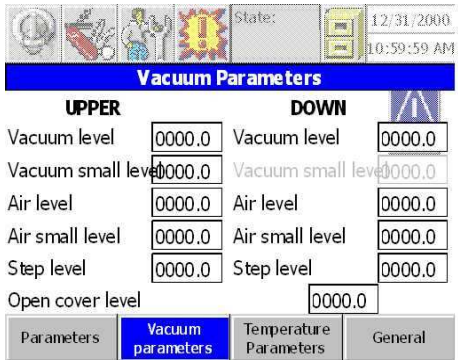
Linearization parameters regarding the upper/lower vacuum gauge by the follow function: VacuumUP/DW = m * (Sensor Value) + q
Where "m" and "q" are set parameters

Time in seconds after which laminator stops the cover opening. Changing this value you can modify the height of the cover when it's open.

Overrun Time in ms after closing cover point from limit switch. This extra time is useful when the cover close without hermetic sealing and it's necessary to manually force down the cover.

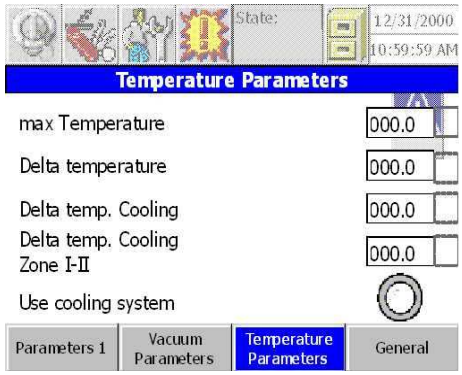


Parameters regarding the vacuum pipeline

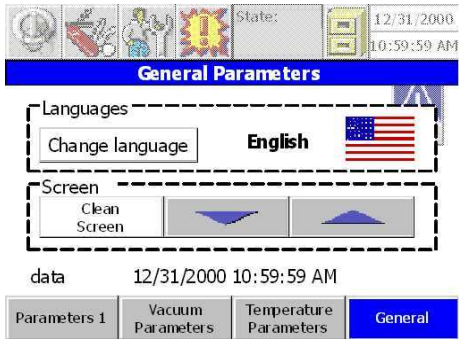


This page contains the main temperature parameters regarding the automatic cycle, the maximum temperature limit of tolerance to pass to next recipe step and the intervention threshold of cooling circuit

By pushing the button "Use cooling system" is enabled or not the hydraulic cooling system.



This page includes the general parameters of setting panel (Language, brightness of the panel, date and time)



"MANUAL COMMANDS" PAGE
The manual commands page consists of 4 submenu:
VACUUM COMANDS, HEATING COMANDS, GENERAL COMAND.

pressure value of upper chamber

Pressure value of lower chamber

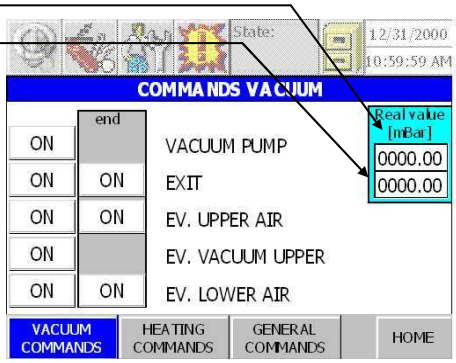
Vacuum pump: Activate (ON) / deactivate (OFF)

Upper vacuum valve: Activate (ON) / deactivate (OFF) the suction valve of upper chamber with precise and/or coarse adjustment

Upper vacuum valve: Activate (ON) / deactivate (OFF) the outflow valve of upper chamber with precise and/or coarse adjustment

Lower vacuum valve: Activate (ON) / deactivate (OFF) the suction valve of lower

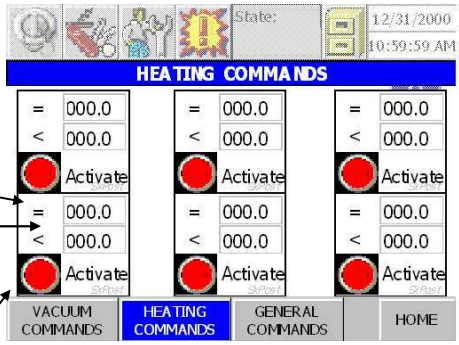
Lower vacuum valve: Activate (ON) / deactivate (OFF) the outflow valve of lower chamber with precise and/or coarse adjustment



Set point temperature concerning a heating zone

Actual temperature concerning a heating zone of plate

Activation of a determined zone with the beginning value "<" should get to set point value



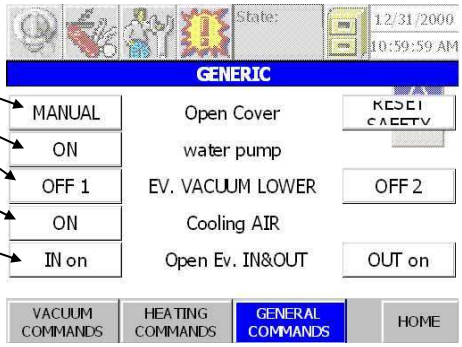
It allows the opening movement of cover

Water pump activation (option)

Activate (ON) / deactivate (OFF) the cooling valve (hydraulic circuit), zone1 /zone2

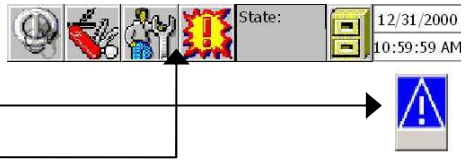
Activation of hydraulic exhaust

Activate (ON) / deactivate (OFF) the IN/OUT valves of hydraulic circuit



"ALLARMS" PAGE

This alarm icon appears on touch screen when a alarm occur. By pushing the button on the upper menu bar is possible to see details and cause of actual alarm and reset the state.

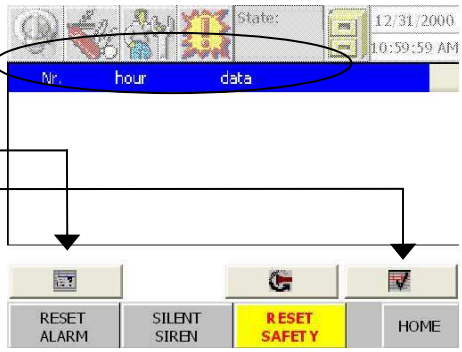


The alarms page contains the follow information:

Chronological List of alarms

The pushbutton "alarm display" show a description of specific alarm selected by the alarm list.

This pushbutton allow the alarm acknowledge from operator.



FOLLOWING THE COMPLETE LIST OF THE POSSIBILE SYSTEM ALARMS		
ALLARM	POSSIBLE CAUSES	HOW TO FIX
ALARM EMERGENCY STOP	the emergency button has been pressed	Restore the emergency button and press auxiliary start to give back voltage
ALARM POWER SUPPLY 24 VDC	The current consumption is too high or it's happened a short circuit.	Verify is some short circuit is occurred and the current consumption; after restart the thermal protection
ALARM WATER PUMP	The power consumption of the motor is too high or the contactor doesn't respond	Verify the real efficiency of the motor and that the control relay is not broken. Restart the thermal protection.
ALARM VACUUM PUMP	The consumption of the motor is too high or the contactor doesn't respond	Verify the real efficiency of the motor and that the control relay is not broken. Reset the thermal protection
ALLARM SAFETY BEAM	Someone or something has interrupt the safety light curtain during the cover closing	Restore the safety beam and reset the alarms
ALARM MAXIMUM TEMPERATURE (HEATING STOP)	The plate temperature exceed the "heating stop" threshold	Check the thermocouple efficiency and if the temperature setpoint in current recipe are too high.

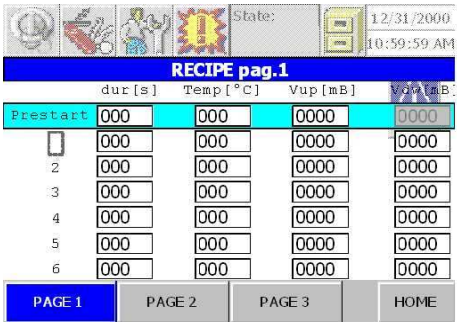
RECIPE PAGE

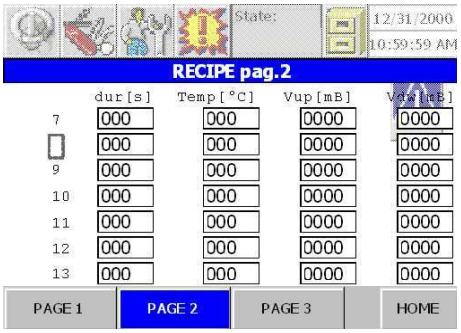
The recipe page includes all parameters concerning the management of machine.
Each lamination cycle is divided into 19 steps + 1 step for prestart values.
The data is sorted progressively in 3 consecutive pages.

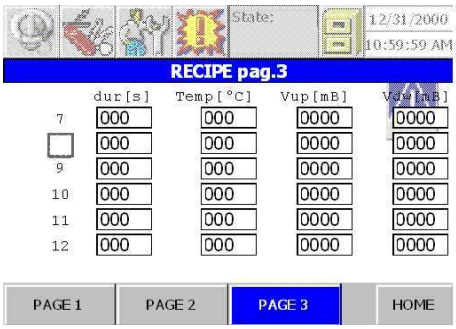
In the recipe pages it is possible to modify the time, temperature and vacuum vales regarding the lamination cycle. The recipe will move forward to the following step only if all the set conditions in the relative fields will be reached.
In the last step the "T.Temp. field must be 9999.
Following the description of the adjustable parameters:

1. dur(s): working time of recipe step
2. Temp(°C): heating plate temperature
3. Vup(mB):Upper chamber vacuum value
4. Vdw(mB):Lower chamber vacuum value

It's advisable to keep a backup copy of set values if you want to do different types of working cycles.



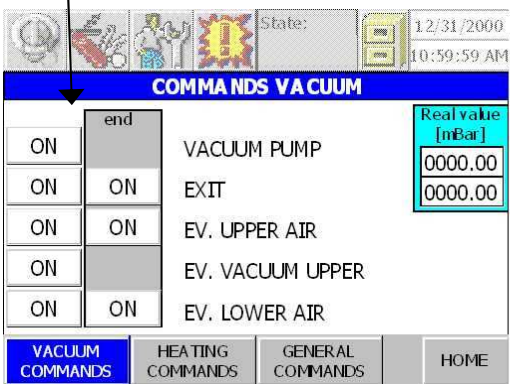




3.7.2 – START UP LAMINATOR

INITIAL REQUIREMENTS (Valid for all tests)	The operator who works with this machine have to know all instructions of this manual. All electrical, pneumatic and hydraulic connections have been done as previously described. The laminator main switch on electric cabinet should be on "0" position.
SAFETY REQUIREMENTS (Valid for all tests)	The operator has to be in front of operator panel which must be placed outside the opening radius of cover. A second operator has to support the first one in order to avoid dangerous behaviour.

1. It's necessary to remove the closing plate on the left side
2. Giving power supply to the electrical cabinet by turning on the main switch in "1" position
3. Check the operator panel start up and verify the home page appears on the touch
4. Turn to release the red "Emergency" pushbutton.
5. Push the blue button "Auxiliary insertion".
6. If some alarms appear on operator panel, select the "ALARMS" page where it's possible RESET all alarms
7. Choose the "MANUAL COMMANDS" PAGE AND PUSH FOR FEW SECONDS THE VACUUM PUMP BUTTON.



The second operator will be positioned on the left side of the laminator to control the pump rotation direction correspond to direction indicated by a sticker applied to the pump.

8. If the pump rotation direction is not the same it is necessary to take off immediately the vacuum pump command on touch screen, and cut off the voltage. After that, it's necessary to reverse two phase of laminator power cable and test again the rotation of direction.

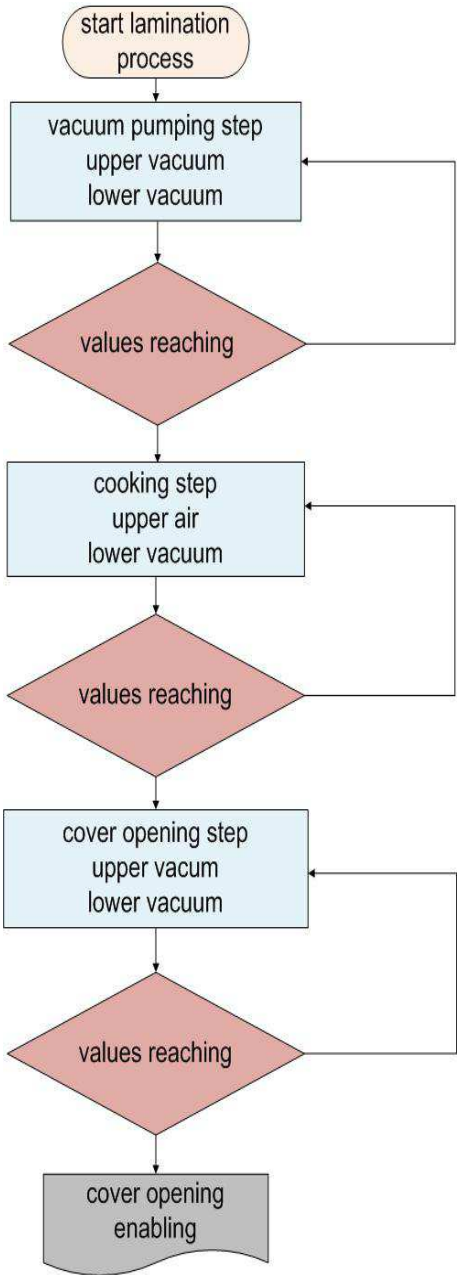
If the pump rotation direction is right the laminator is ready to work

We recommend testing one to one all the manual commands in order to verify that all features are ok before to start an automatic cycle.

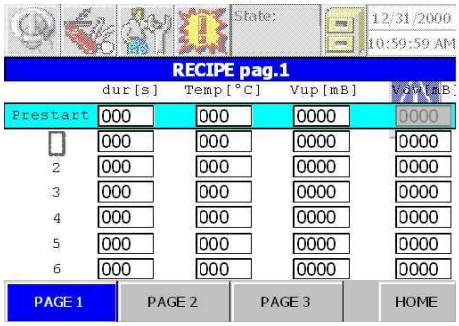
3.1. – CHECK STEP BY STEP OF MAIN FUNCTIONS AND TROUBLESHOOTING	
INITIAL REQUIREMENTS (Valid for all tests)	The operator who works with this machine have to know all instructions of this manual. All electrical, pneumatic and hydraulic connections have been done as previously described. The operator panel must be turned on with the home page settled. The input water valve must be open The output water valve must be open The compressed entry air pressure regulator should be placed on 6bar
SAFETY REQUIREMENTS (Valid for all tests)	The operator has to be in front of operator panel which must be placed outside the opening radius of cover. Other persons or things must be at least 2mt away from laminator perimeter. Inside the laminator should NOT be introduced anything. The operator in this time should not run out inside the lid.

OPERATION	HOW TO COMPLETE THE OPERATION	Monitoring and checking	PROBLEMS	CAUSE/REMEDY
OPENING/CLOSING COVER CHECKING	From home page select the manual mode and after the "opening cover" command.	At start command the lid open/close	The cover doesn't open/close	- fuse broken / check the fuse and replace if necessary. - Inverter broken or blocked / check the inverter code on display inverter. - motor failure / replace motor
		The moving cover have to be regular along the stroke	The moving cover is not regular and/or noisy	- The motion parts are not in efficient working status/ Check the cleaning of moving head, slide and nut, if necessary to grease the ball bearing screw
		Verify the perfectly aligned during the closing.	Lid and base are not perfectly aligned.	- The back side is a little bit open / increase FEW milliseconds the cover closing time. - The front is a little bit open / decrease some millisecond the cover closing time. - The closing proximity sensor is broken or in bad position / check this sensor located close to ball bearing screw
		Check stopping point to the upper limit switch. If the limit switch doesn't work, take care do not open the cover to the horizontal support but stop at least 40cm before	The cover doesn't stop in automatic mode to the upper limit switch during the opening.	-The upper proximity of end stroke doesn't work/ check functionality
		Check stopping point to the lower limit switch.	The cover doesn't stop in automatic mode to the lower limit switch during the closing.	-The lower proximity of end stroke doesn't work (broken or in wrong position)/ check this sensor located close to ball bearing screw
VACUUM CIRCUIT CHECKING	Close the lid as described on the previous point, go to the page: "VACUUM COMMANDS" and activate the vacuum pump "VACUUM PUMP ON" Control alternately the upper and lower air/vacuum valves.	Check the upper chamber vacuum value is close to zero.	There is no vacuum on the upper chamber.	-Verify the presence of compressed air. (needed for the operation of vacuum valve functionality) -Verify the membrane integrity status -Verify the valves integrity status
		Check the suction on lower chamber	There is no suction on lower chamber	-Verify the presence of compressed air. -Verify the cover closing position -Verify the valves integrity status
		The vacuum condition on upper/lower chamber must be maintained at least 1 minute	The vacuum condition is not retained	O-ring is damaged or not perfect fit to the surface / replace the o ring - The membrane is damaged / replace it
HEATING PLATE CHECKING	With reference to manual mode, select the "Heating command" menu and activate one by one the 4 heating zone by editing a value on the field "="	The heating plate after editing a value start heating to reach the setpoint value.	The heating plate doesn't work	- fuse broken / check the fuse and replace if necessary. -Automatic circuit breaker tripping/ check the corresponding breaker
			The plate doesn't heat in uniformly way	One or more heating resistances don't work / replace heating resistances
COOLING SYSTEM CHECKING	With reference to manual mode, active the water pump (if present) and activate one by one the two valves that control the two cooling area	Set on the cooling valve and verify if cooling water flow inside the pipeline and cool the plate with uniformity	There are loss of water	-Seek the point loss and replace the broken item .
			The plate doesn't cool in uniformly way	- The electro valves don't open cooling circuit - It's not active the cooling system / enable the "COOLING SYSTEM" function by the "PARAMETERS" page on the operator panel
PURGE HYDRAULIC CIRCUIT	With reference to manual mode (general page) pusch the bottom cooling air.	Set on the cooling air bottom, the hydraulic circuit is completely freed	The hydraulic circuit doesen't purge	- Verify the presence of compressed air. / -Verify the valves integrity status
MEMBRANE CHECKING	Open the cover and, watch the membrane state, first in atmospheric pressure and them in vacuum conditions.	The membrane must be integrates, set correctly in atmospheric pressure. In vacuum conditions (on upper chamber) the membrane is well placed over the entire surface	The membrane has wrinkles, folds, gathers or is not spread out evenly. In vacuum conditions doesn't well placed over the entire surface.	The membrane have to pull / 1-open one hook 2- pull the membrane with flat pliers 3-close the hook -The membrane has concluded its production cycle / replacement membrane.
CHECK THE SAFETY LIGHT BARRIER	Verify that each interruption of a light beam during the cover closing movement triggers a interruption of movement of cover.	The movement of cover have to stop and an alarm condition have to appear with the machine in emergency status.	The cover don't stop moving	Check the integrity of safety light barrier

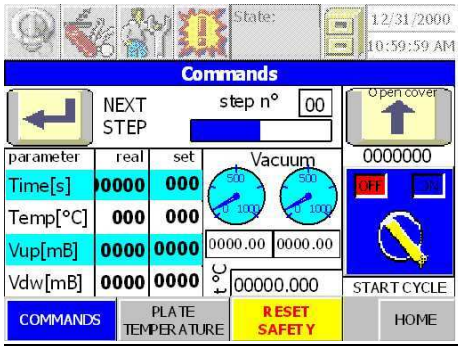
4. LAMINATION INSTRUCTIONS



After checking all the laminator functionality it is possible laminating in automatic mode.
Editing the recipe page with the values for every step needed.



Select the COMMAND page:



And push the "START CYCLE" button. In the automatic mode the laminator reach the prestart values. When the set point values are reached the green lamp will begin to blink and it's possible to introduce the panel.
Then close the lid and after the machine starts automatically the lamination cycle and stop at the last recipe step when lid open for a time in seconds settled by recipe parameters

5. MACHINE MAINTENANCE

5.1. ORDINARY MAINTENANCE

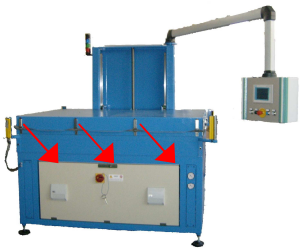
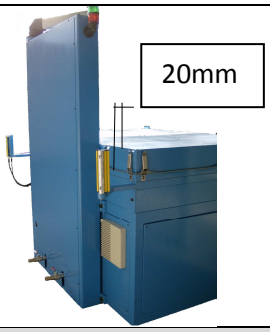
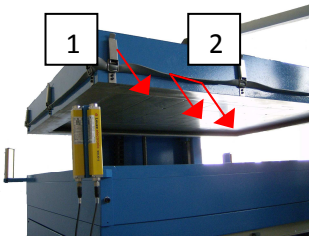
The table below shows the action needed at planning time in order to maintain the efficiency of laminator, note: The hour refers to PARAMETER hours on screen parameters of the touch screen.

WHERE NOT EXPLICITLY INDICATED THE ORDINARY MAINTENANCE MUST BE DONE WITH LAMINATORE TURN OFF, WITHOUT VOLTAGE, PNEUMATIC CIRCUIT OPEN, HYDRAULIC CIRCUIT OPEN AND EMPTY, COLD LAMINATOR PLATE.

h	Operation/	HOW TO COMPLETE THE OPERATION
8	After each shift clean the laminator plate with carefulness.	
	Check membrane; Check the safety light guard.	See chapter 3.1
24	Check oil level of vacuum pump	See vacuum pump handbook attachment
250	Cleaning the slide shoe and slide and greasing	with cleaning rag remove any dust and greasing
	Check cleaning of nut and greasing	with cleaning rag remove any dust and greasing
500	Change oil vacuum pump	See vacuum pump handbook attachment
1000	Cleaning of radiator, motor fun protection and vacuum pump.	See vacuum pump handbook attachment
	Change oil filter of vacuum pump	See vacuum pump handbook attachment
	CHECK THE SEAL OF REDUCTION GEAR SEAL	Open the lid to the end position and leave in this position, removing power supply for at least 8 hours, check after that the lid position has not moved from initial position.
	Check opening/closing lid, vacuum circuit, heating plate, cooling system functionality, drain of hydraulic circuit	See chapter 3.1
2000	Replacement of vacuum pump strainer	See vacuum pump handbook attachment

5.1.2 ORDINARY MAINTENANCE REPLACEMENT MEMBRANE

When it's necessary

		
1- with the laminator cover close ,opening the hook, and remove membrane. 2-heat the plate at 140°C, place the new membrane above the heating plate and wait for 10 minutes	3-RePositioning the frame and the new membrane at 20mm from the cover Reassemble the frame closing the hook.(first in the rear side, then in the left and in the right side, for the last the front side)	4- Open the cover and Watch the membane state, it must be well placed over the entire surface. If it's not well placed, 1-open one hook 2- pull the membrane with flat pliers 3-close the hook

5.2. SPECIAL MAINTENANCE OPERATIONS

INITIAL REQUIREMENTS AND SAFETY REQUIREMENTS	All the operations of normal or special maintenance carried out on the machine, must only be undertaken by trained personnel. Cut off the electrical power at the control panel, Released the compressed air from the equipment, released the cooling liquid from the hydraulic circuit. Ensure that the temperature of the heating plate is less than 40°C

5.2.1. REPLACEMENT ELECTRICAL RESISTORS

1. Remove the sheet guard of heating plate
2. –Remove the lower plate frame
3. –Remove the protection cap on electrical contacts
4. –Remove the resistor to be replaced
5. Cover with conductive paste the new resistor and insert in the heating plate
6. -Restoring the electrical connection and reseal the cap on the electrical contacts
7. –Reassemble the frame and the sheet guard.

5.2.2. REPLACEMENT THERMOCOUPLES

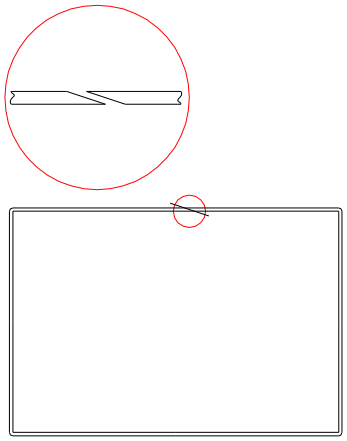
1. Remove one sheet closing lateral
2. -Unscrew the thermocouple's keeping head
3. Unscrew the ring nut of the electric contact
4. –Replace the thermocouples
5. –Screw the ring nut
6. –Restore the electrical contact

5.2.3. REPLACEMENT O-RING

1. if necessary, remove the frame where the o-ring is placed

2. remove the o-ring
3. clean the o-ring seat with carefulness.
4. Place the new o-ring
5. The point of union should be done by cutting the o-ring in an oblique with very sharp blade to avoid smudges, see Figure

6. Press evenly along the entire perimeter and making sure the o-ring
7. if necessary, reassemble the frame



6. MACHINE DISPOSAL

The machine must then disposed of in accordante with the laws in force in the country where it has been used, by firms who are specialist in disposal industrial machines.

The oil contained in the vacuum pump must be drained out, see the vacuum pump instruction.

Have material polluted with any oil residue disposed by specialist companies.

For lifting and transporting operation see chapter 3.

If the machine is placed prior to disposal, move the laminator away from a suitable area, cover the machine with a protective sheet so as to prevent rain, snow and humidity from damaging the structure, causing oxidation and rust.

The floor on which it is placed must be made of washable materials, and not an absorbent one, with suitable drains for any oil leak or rust loss. These drains must collect any leaks or losses from the machine into suitable sealed storage tanks which are not-assorbent.

7. LIST OF RECOMMENDED SPARE PARTS

DESCRIPTION	CODE
ELECTRICAL RESISTORS Ø8 L=500	
THERMOCOUPLES TYPE j 3mm	-
O-RING Ø8	L150A_O-RING
SILICONE MEMBRANE	
VACCUM PUMP STRAINER KIT DVP LC105	K9603021
VACCUM PUMP MAINTENANCE KIT DVP LC105	K9603021/1
VACUUM PUMP OIL DVP LC105	8813500(BV100)/ 8833500(SW100)
OIL FILTER	1809001
OIL LEVEL GAUGE	1105004
RETOUCHING COLOR	RAL 5015

8. MECHANICAL COMPONENT LIST

FIG.1

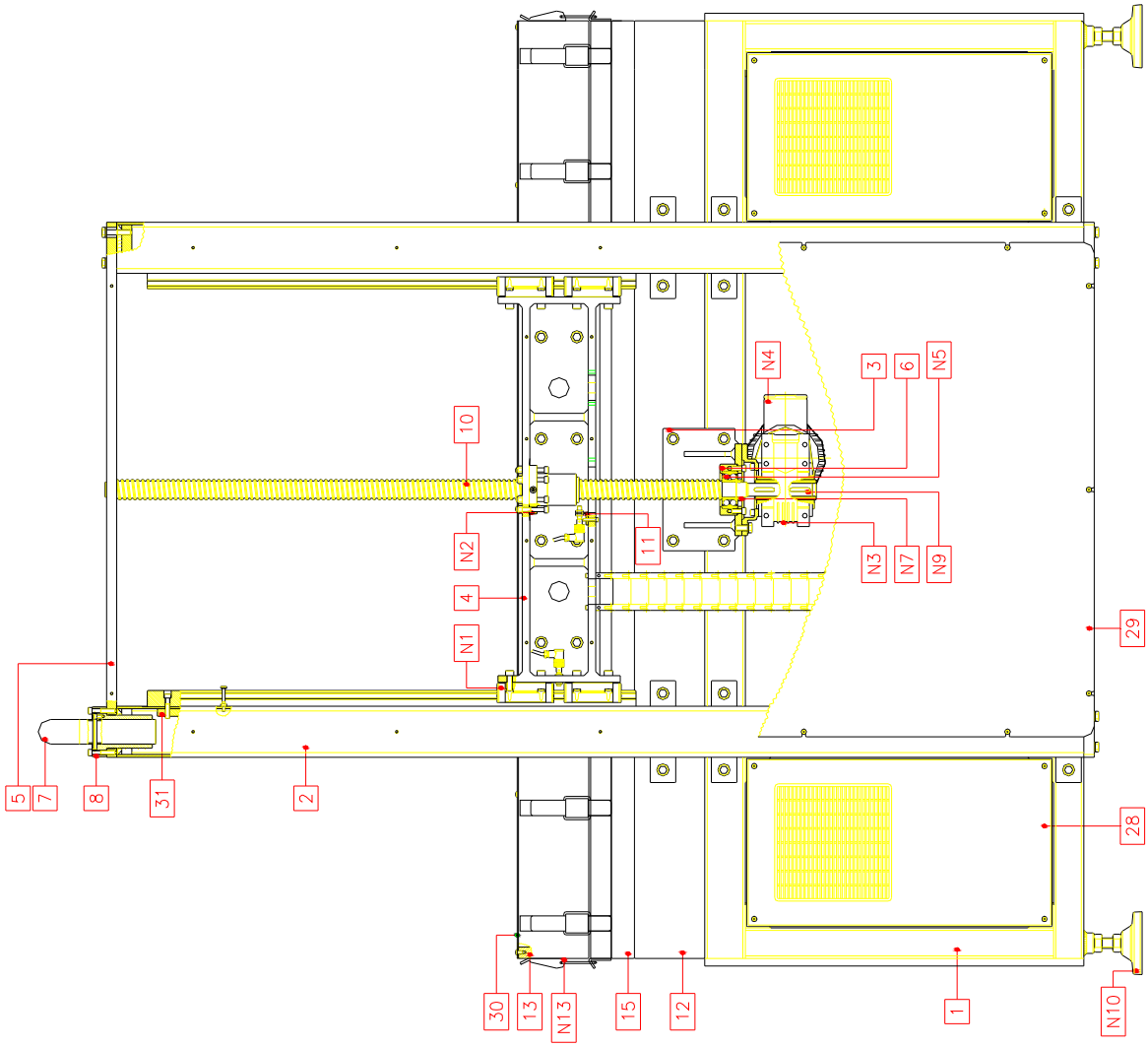
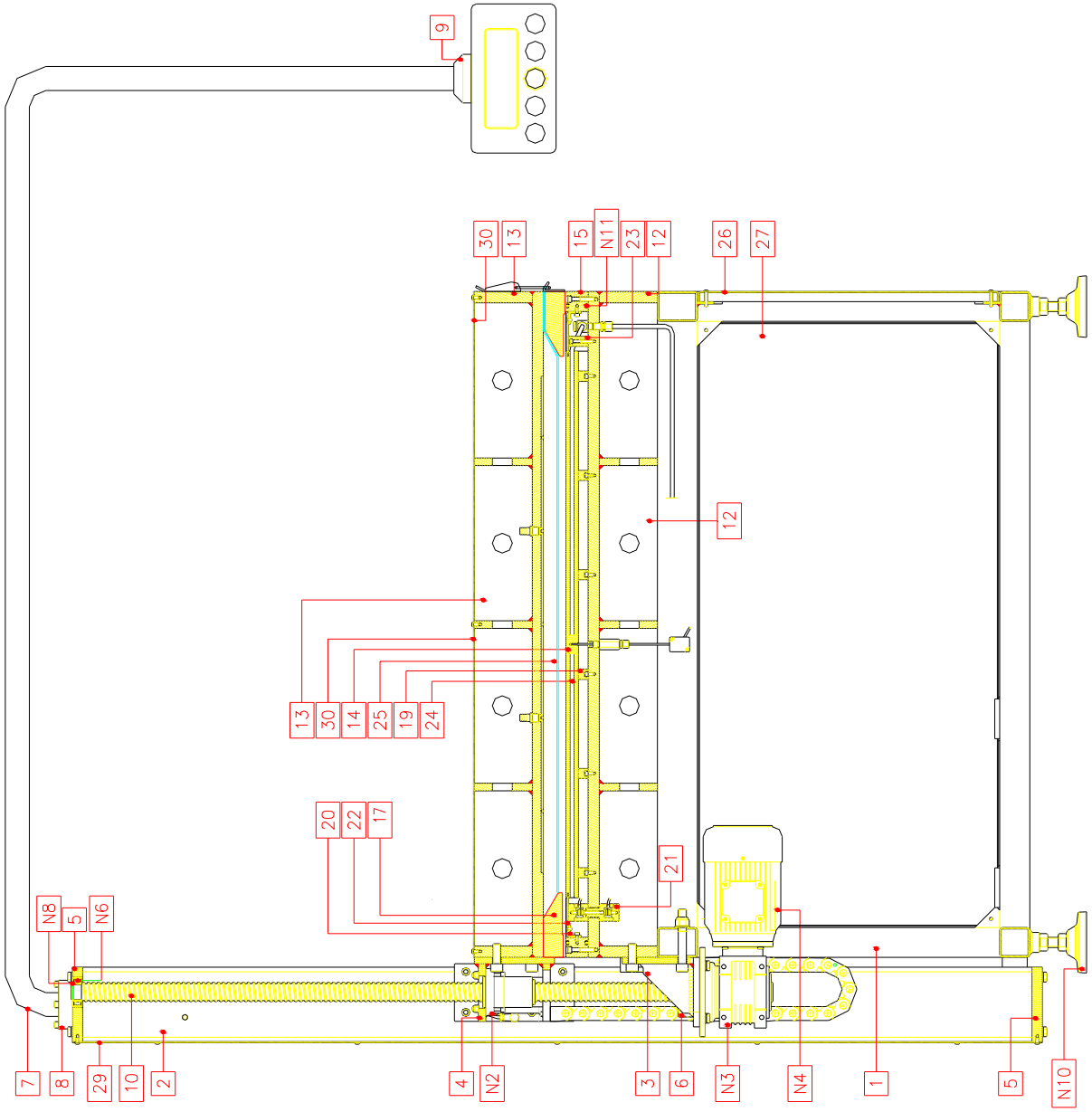


FIG.2


9
30
13
15
N11
23
12
26
27
12
13
30
14
25
19
24
20
22
17
21
N8
5
N6
7
8
29
10
2
4
N2
3
6
N3
N4
1
5
N10

POS	DESCRIPTION	Q.Tà'
1	Lamiantor frame	1
2	Coloumn	1+1
3	reduction gear support	1
4	Horizontal driving support	1
5	Horizontal coloumn support	1+1
7	Mobile arm of operator panel on left front side	1
10	ball bearing nut	1
12	Base machine	1
13	Laminator Cover	1
14	Heating Plate	1
15	Bottom frame	1
17	Membrane frame	1
		2+2
19	Bakelite support	12
21	Connector group	12
22	sheet guard of heating plate	2+2
23	Scheet support	12
24	Resistor	18
25	Membrane	1
26	Front sheet guard	1+1
27	Lateral sheet guard	2
28	Rear scheet guard	2
29	Coloumn cover	1
30	Scheet guardo f laminator cover	2
31	slide	2
N1	sectional guide	2
N2	ball bearing screw	1
N3	reduction gear of cover electrical motor	1
N4	cover el. motor	1
N5	lower bearing connection of ball bearing screw	1
N6	upper bearing for ball bearing screw	1
N7	Ring nut	1
N8	Seeger-Rings for shafts	1
N10	Adjustable feet	4
N11	O ring	**
N13	Hook	14