

ALTIMAK

FOLDING & PACKAGING

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M500 USER'S MANUAL

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1. SECURITY INSTRUCTIONS

1.1. ACCORDING PRINCIPLE OF UTILIZATION

The design of the adaptation of the equipment it was made by following the minimum-security formalities required in the RD.1215/97. However, it may produce dangers because of the bad use, suffering damages to the machine and other stuff, and in the worst case, personal damages.

The utilization on the machine has to be allowed only in the perfect technical conditions. The operator has to know the conditions before the use, the security instructions and the possible risks. It is very important to delete the possible ambient perturbations that may harm the security.

It is absolutely banned using the machine in non-defined normal tasks. It has to be used to the use it was designed for.

The operation with the lateral doors opened or not properly closed, it is also banned. Those can only be opened when the machine is unpowered and with no pression.

The observation and knowledge of the service instructions, maintenance and inspection are part of the normal utilization.

1.2. SECURITY ORGANIZATION MEASURES

- Take care and storage the user's manual in an accessible place for the machine workers.
- As a complement of this security instructions, workers should have a good knowledge of the basic protection rules against accidents and to protect the environment, fixed by law.
- The machine workers have to read the user's manual, specially the security instructions. Those are also valid for workers who work eventually with the machine in maintenance, reparation...

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- Operators must wear the clothes properly tied, in order to avoid accidental entrapments with the mobile elements of the machine. Do not wear rings, watches, bracelets, chains or other elements that may get entrapped with the machine. Workers with long hair, must wear the hair collected.
 - When necessary, use Personal Protective Equipment. Read the “Personal Protective Equipment” section in 7.2, *page 21*.
 - In case of detecting anomalies that could affect the security or the service, Disconnect the machine and notify immediately to the responsible.
 - Do not realize modifications, additional constructions nor add accessories to machine that may affect the security functions.

1.3. STAFF QUALIFICATION

- Only the properly qualified staff can work with the machine. Pay attention to the minimum age allowed by law, and take care of workers, they must be object of special attention, as the preventive occupational hazards law dictates.
- Guarantee that only authorized personnel works with or manipulates the machine.
- Establish clearly the attributions and the tasks of the workers, in order to do the preparation, operation, maintenance or reparation of the machine
- The Works and manipulations in pneumatic equipment it only can be made by a specialist or a qualified worker under a specialist supervision.

1.4. SECURITY AND OPERATION

Before the start up:

- Take the appropriate measures with the purpose of the machine Works only in safe conditions. It can only operate, when security and protection items work properly.
- Verify once a work shift if there are visible deficiencies or anomalies that may affect the security of the machines or the workplace. In case of detecting someone, notify immediately to the responsible. If this affect the essential security requisites, stop the machine right away.
- Check that there is nobody exposed to danger or too close to a dangerous zone.

Start up:

- It will be done as it is explained in the *section 4, page 11* called “Installation and starting up”.
- Stop immediately the machine in case of detecting anomalies in the operation and disconnect the tension and the compressed air intake before manipulating it.
- Never disconnect any security item in order to manipulate the machine while is working.

1.5. SPECIAL WORKS AND MAINTENANCE

- Follow the maintenance established program, and those can only be done by authorized specialized staff.
- Notice the operator of the beginning and the end of those works.
- Signpost and block the working zone with a sign and a security band (red and white).

-
- Instructions of connecting and disconnecting must be followed as it is explained in *sections 3 and 4*. The works who may require this are those which affect the service, production adaptation, modification or adjust of machine and security items and the reparations.
 - The machine has to be disconnected in the maintenance or repair operations. It is also necessary to protect the machine against accidental connection.
 - Only allowed staff can manipulate and subject loads. The supervisor or the one who gives orders, must keep the operator visible all the time. If there are pieces difficult to manipulate, it will be done with two operators.
 - Keep the equipment clean, specially the connections and fixations. Use suitable products.
 - Once the cleaning is completed, check all the connections and conductions in order to detect a scape, loose joints, or damaged points. Repair all the observed damages.
 - If the machine maintenance requires to disassemble security items, then the maintenance worker will have to verify the correct operation once it be assembled again.
 - The damaged parts and other elements that were replaced, will be scraped without affecting the environment.

1.6. SPECIAL DANGERS

Pneumatic dangers:

- Only staff with experience and knowledge in pneumatic can do the works on those installations.
- Check the conductions, lines and fixations with regularity, if leaks are detected, it must be repaired immediately.

- Let the pressure drain away the components, before starting a reparation.
- Assemble the conductions correctly, verify the length and quality of que replaced conductions and check the system does not have any leak.

Danger in welding work:

- All the reparations and maintenance that require welding works will be done in the workshop area enabled to these tasks.
- Exceptionally, in case of the need to realize welding Works in the working place, must follow the next security instructions:
 - Clean the dust, oil and combustible materials that may have the machine.
 - Protect the easily deteriorating zones; such as: plastic, gums ...
 - Give special attention in keeping inflammable substances and threads impregnated of them away.
 - If the place where the welding Will be done is cleaned with thinner, clean the zone with water before starting, in order to remove the remains of thinner.

Dangers in the manipulation of oils, grease and other chemical substances:

- Product prescriptions in the security safety data sheet (SDS) must be followed.
- Call for the SDS to the manufacturer, and attach to Laboral Security documentation of the company.

1.7. SECURITY ELEMENTS AND CORRECTIVE MEASURES

Security elements have the objective of avoiding accidents due to hits, cuts and entrapments with mobile components of the machine. All the protections are designed and installed to avoid this kind of accidents in normal operation.

Security elements cannot be manipulated neither disassembled for the purpose of annul the security functions whereby are designed.

2. TECHNICAL CHARACTERISTICS

Electric and pneumatic characteristics:

Input: Monophasic + neuter + ground, 50Hz 230V ($\pm 3\%$) A.C

Power: 150 W

Working pressure: 6'5 bar

Differential switch: 300 mA

General characteristics:

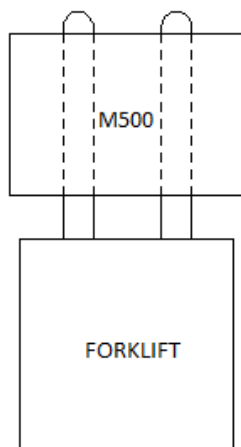
High: 855 mm Width: 905 mm Large: 1140 mm

Weight: 200 Kg

Production capacity: 500 cycles / hour

- **Name:** "MÁQUINA M-500"
- **Type:** Automatic machine
- **Marca:** AUTIMAK
- **Code:** M-500
- **Manufacture year:** 2019

Transport:



Transport with a forklift or a pallet truck, subjecting the machine from the low part.

3. GENERAL DESCRIPTION

3.1 APPLICATION DESCRIPTION

M500 machine is made for folding kid's and adult's T-shirts automatically.

It has a four folders system to fold the T-shirts. It also has a "horns" to make the manual packaging easier and a trapdoor to stack the folded T-shirts in its down part.

It has different programs which allow the user to choose which folders are going to work and to turn on/off the bagging and the stacking system.

The folding cycle is detailed in point 4, page 12 and point 5, page 16.

3.2. SECURITY SYSTEM

There's an emergency button in the control panel.

When it is pressed the machine gets stopped automatically and all the folders lose the pressure.

To put the machine in operation again, the user has to disarm the emergency button and press the run button again.

There are stickers alerting of the dangerous parts of the machine.

It is totally forbidden to use the machine without the security devices correctly installed and with the right operation.

IMPORTANT: If the machine is used without voltage the security devices are not going to work.

4. – INSTALLATION AND STARTING UP

Place it in the required site and according to its optimal ergonomic use.

Check the security measures.

Plug the pneumatic and electrical connections.

Turn on the electrical protections like the circuit breakers.

Plug the compressed air connection to the machine.

To start it up for the first time follow the following instructions:

AUTOMATIC MODE:

1. Activate the general switch.
2. Deactivate the emergency button.
3. Press both run buttons for 4 seconds.
4. Place a T-shirt in the folding area and fold the sleeves.
5. Press both run buttons at the same time.
6. The folding process starts.
7. When it finishes, depending on the program chose the horns stands up, the trapdoors get opened or the cycle finishes.
8. The machine gets ready for a new cycle.

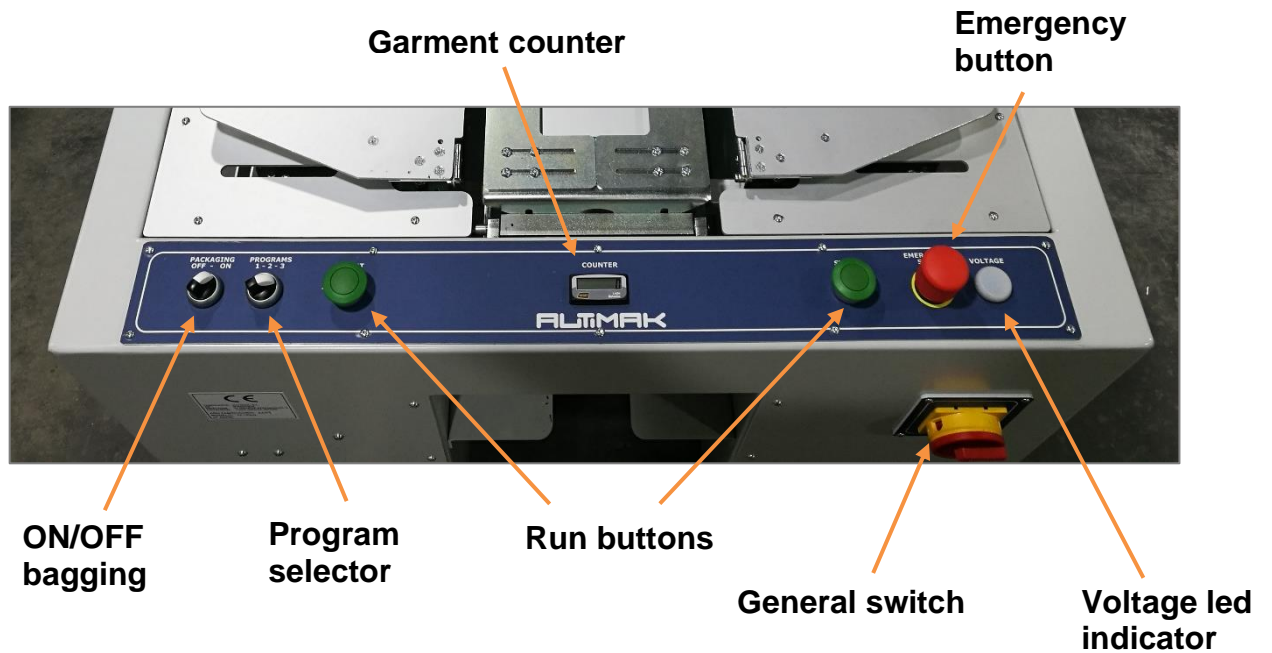
Notes:

The manipulation of any machine's part must be done always with the machine stopped and the emergency button pressed.

The maintenance jobs must be done fort the maintenance responsible and always with the machine disconnected and without air pressure.

¡Any manipulation done by a different person different than the manufacturer is going to be user's responsibility!

FOLDING AREA



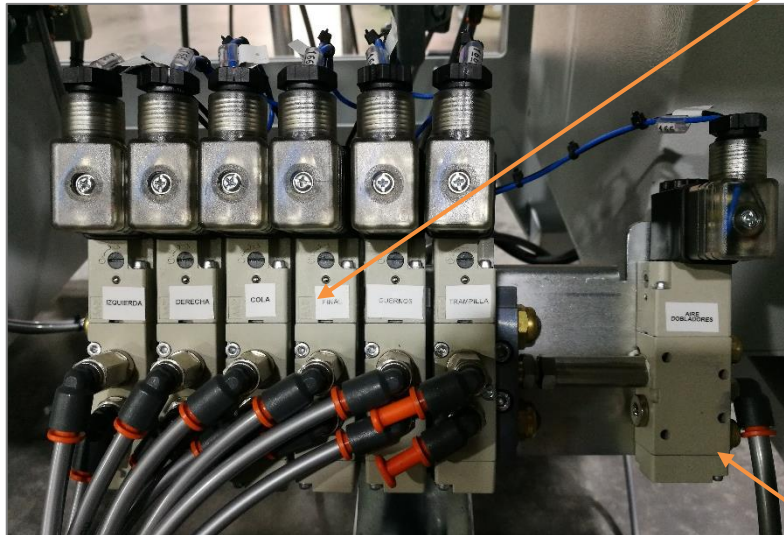
AIR PRESSURE REGULATOR



**Air pressure
regulator with
filter**

**Working
pressure = 6 bar**

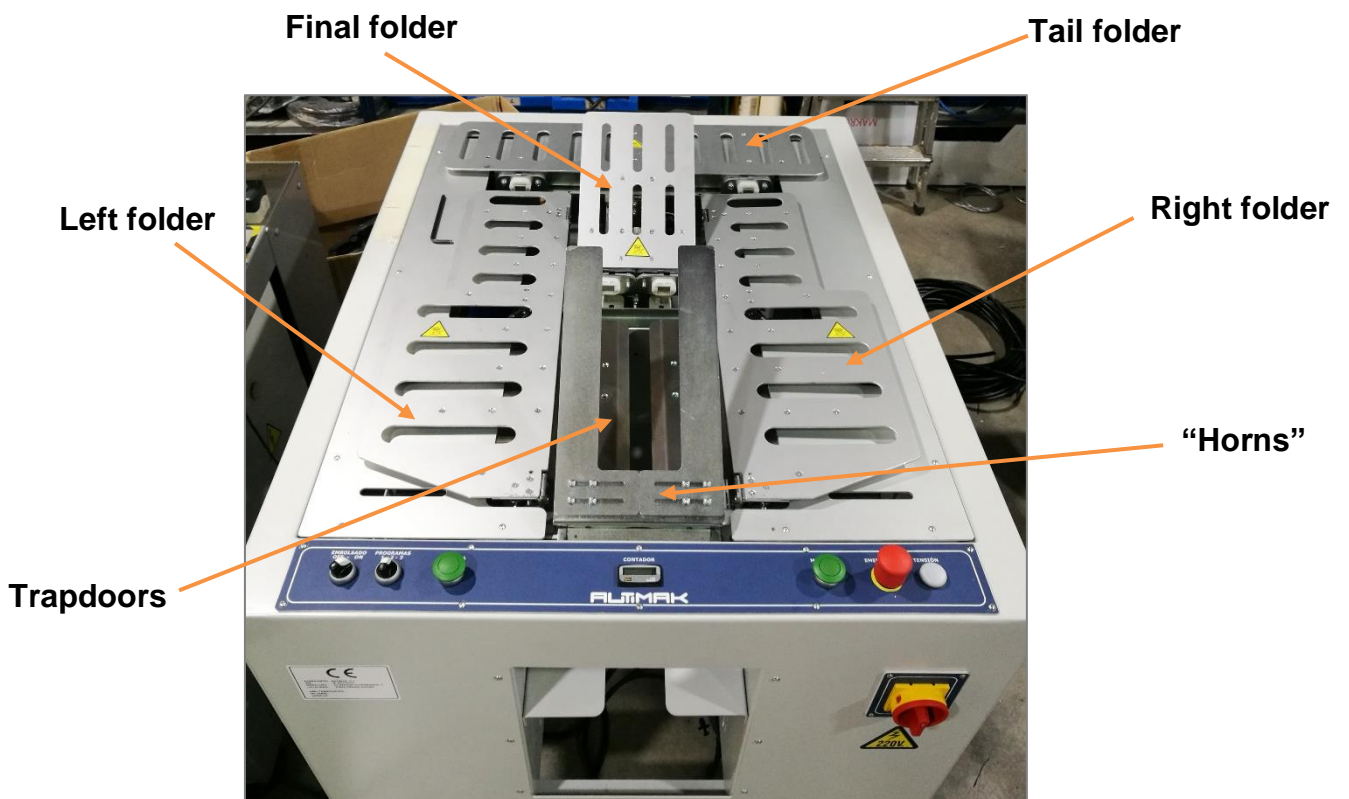
FOLDING VALVES



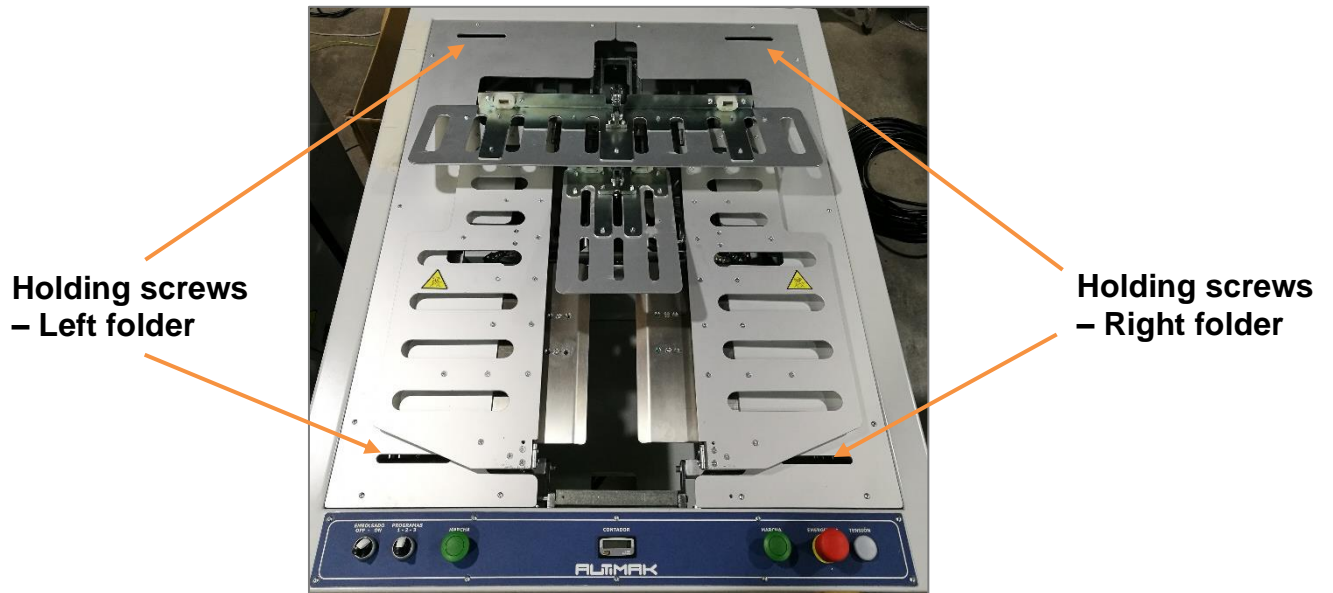
Folding valves kit: Left /
Right / Tail / Final / Horns
/ Trapdoors

Main air valve

FOLDERS



FORMAT CHANGE



It is possible to adjust the final dimensions of the folded garment moving the folders. To adjust it, the user has to loosen the screws of the folder without removing it and move it to the required place, then tight it again.

FOLDING CYCLE:



1) Tail folder (It is possible to deactivate it)



2) Left folder



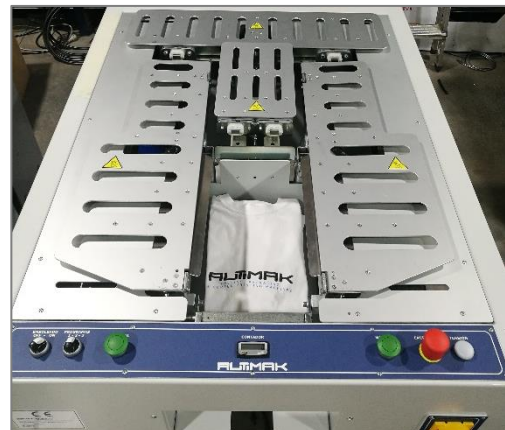
3) Right folder



4) Final folder



5) The horns go up (Bagging ON, it's also possible to deactivate it)



5) The trapdoors get opened (Bagging OFF)

PROGRAMS

NOTE: To use the machine for the first time or after an emergency stop the user has to disarm the emergency button and press the run buttons for 4 seconds.

Bagging turned ON (using the “horns”):

Program 1: Folding in the following order: The “horns” goes down – Left folder – Right folder – Final folder – The horns goes up allowing the user to bag the T-shirt.

Program 2: Folding in the following order: Tail folder – Final folder – The horns goes up allowing the user to bag the T-shirt.

Program 3: Folding in the following order: Tail folder – Left folder – Right folder – Final folder – The horns goes up allowing the user to bag the T-shirt.

Bagging turned OFF (without the horns mounted):

Program 1: Folding in the following order: Left folder – Right folder – Final folder – The trapdoors get opened and the folded T-shirt falls in the stacker of the machine.

Program 2: Folding in the following order: Tail folder – Left folder – Right folder – Final folder.

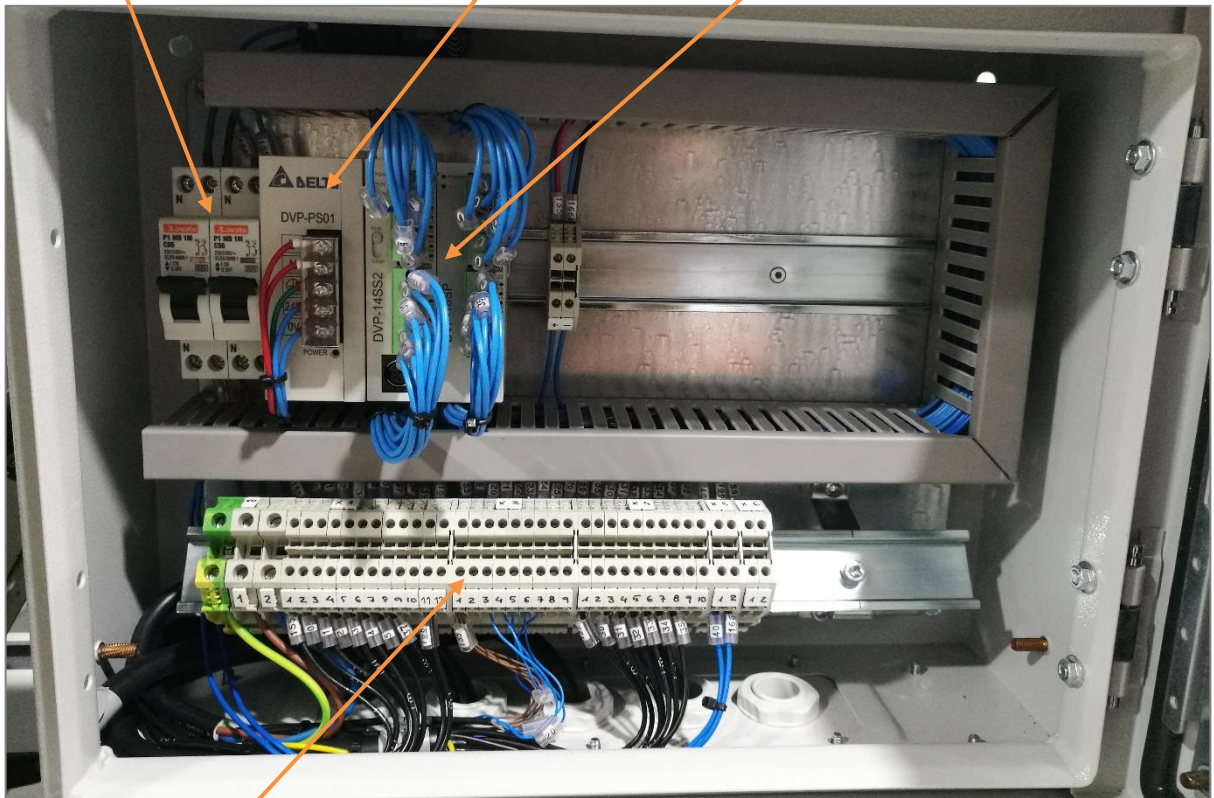
Program 3: Folding in the following order: Tail folder – Left folder – Right folder – Final folder – The trapdoors get opened and the folded T-shirt falls in the stacker of the machine.



Stacker

DISTRIBUTION PANEL

Circuit breaker **Power supply 24 VDC** **Programmable logic controller**



Terminal connectors

6.- MAINTENANCE PLAN

6.1.- Spare parts list

ELECTRICAL SPARE PARTS:

Part	Trademark and specifications	Units
Power supply	DELTA DVP-PS01 24 VDC	1
PLC	DELTA DVP-14SS2	1
PLC module	DELTA DVP16SP	1
Circuit breaker	Lovato P1MB1MC06 1p+N 10A	2
NO Push-button	Green mushroom push-button Müller	2
NC Push-button	Red mushroom emergency button Müller	1
Led voltage indicator	Müller	1
0-1 Selector	Müller	1
0-1-2 Selector	Müller	1
Main switch	25A Müller	1
Counter	AUTONICS LA8N	1

Pneumatic spare parts:

Element	Trademark and specifications	Units
Piston cylinder (Right folder)	FESTO Ø25 x 100 mm	1
Piston cylinder (Left folder)	FESTO Ø25 x 100 mm	1
Piston cylinder (Tail folder)	FESTO Ø25 x 100 mm	1
Piston cylinder (Final folder)	FESTO Ø25 x 100 mm	1
Piston cylinder (Horns)	FESTO Ø20x 20 mm	1
Piston cylinder (Trapdoors)	FESTO Ø20 x 80 mm	1
Filter regulator	FESTO 0-12 bar 20µm	1
Mainfold block	FESTO 6 elements 1/8"	1
Solenoid valves	FESTO EW5/2 1/8"	7
Reeds	FESTO	5
Compressed air tank	API 2.5L 11bar	1

6.2. Preventive maintenance

The maintenance jobs have to be done by the maintenance responsible.

To do the maintenance, the user has to disconnect the machine and the compressed air supply. If it is done with voltage the emergency button must be armed.

Every week:

- Lubricate the moving parts.
- Clean the machine and the air fan.

Every year:

- Open the lateral windows and make a general cleaning of the machine.
- General cleaning of the distribution panel.

7. RISK EVALUATION AND PPE

7.1.- POSSIBLE RISKS:

Never cross the working area of the machine while it is working. There are stickers pointing the dangerous areas. Be careful in these areas.

RESIDUAL RISKS:

- Knocks
- Getting caught

The risks are tolerable due to their low severity

The stickers of the picture show the risk zones.

Figure nº10



Never hold any part of the machine while it is moving, the user or anyone mustn't do it!

Never overcome 6'5 Kg/cm² of pressure to avoid the risks.

7.2.- PERSONAL PROTECTIVE EQUIPMENT (PPE)

Footwear with protection for industrial work



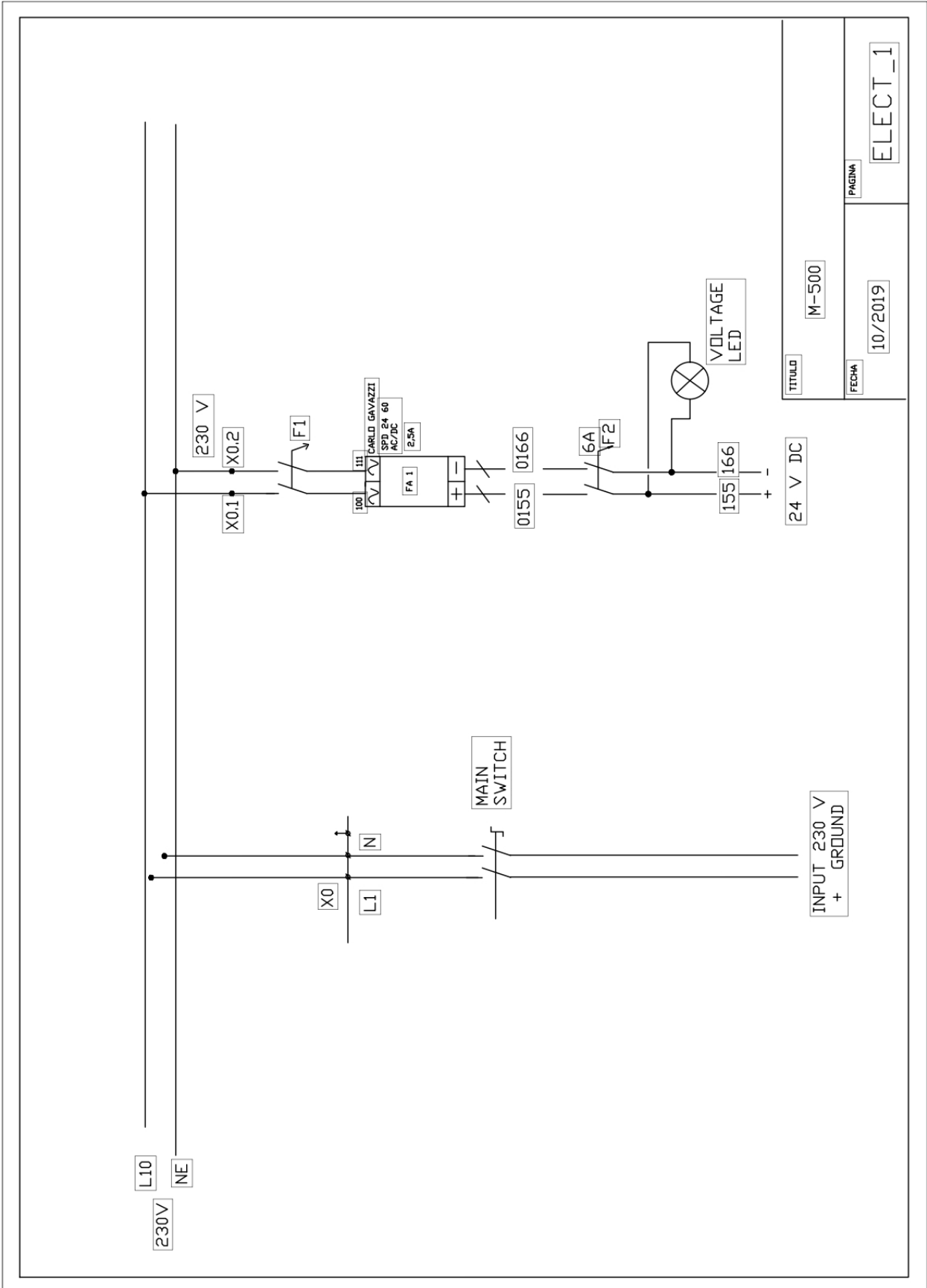
IMPORTANT:

Any modification on its machine have to be approved for the manufacturer with the revision of the documentation. If this process is not done the warranty is lost and then any malfunction or accident are not going to be responsibility of the manufacturer.

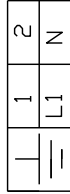
7.- ANNEXES

ELECTRIC SCHEMES

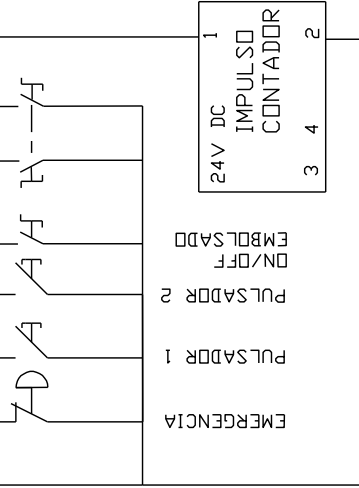
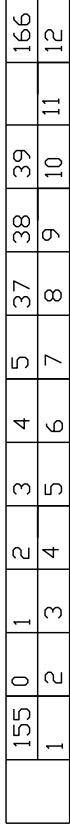
M-500



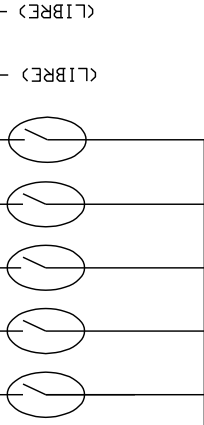
X0



X2

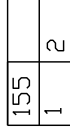


X3

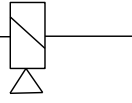
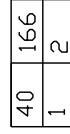


CUERNDOS
FINAL
COLA
DOBLADOR
DERECHA
DOBLADOR
IZQUIERDA

X6

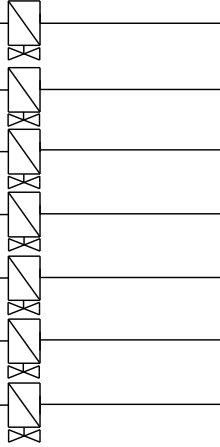


X5



ZUMBADOR

X4



AIRES A
PLEGADORES
PLEGADOR
IZQUIERDA
DERECHA
PLEGADOR
COLA
PLEGADOR
FINAL
CUERNDOS
TRAMPILLAS

TITULO	M-500	
FECHA	08/2019	PAGINA
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