(Original) Use and maintenance manual

Type: Auto-Puncher for timing belts
Model: APTM-600

IMPORTANT

Carefully read this User Manual and follow the instructions and warnings before operating the machine.

Any modification or change may cause the loss of warranty and manufacturer liability.

This Manual should always be stored the machine and visible for operators and maintenance technicians for any future reference. The Manual is part of the machine.

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Page

- CE Declaration of conformity:

WE DECLARE, under our responsibility, that the machine:
- Type: Automatic Puncher
- Brand: ERM Engineering
- Model: APTM-600
- Serial No.: xxxxxx
- Manufacturer date: 2021

Inspired by the directives of the Official Journal of the European Communities:

2006/42/CE Machinery Directive
2014/35/UE Low Voltage Directive
2014/30/UE Electromagnetic Compatibility Directive

Complies with the design and construction specifications of the European Standards on General Machine Safety:

EN 349 – EN 614-1 – EN 614-2 – EN 1005-1 – EN 1005-2 – EN 1005-3 – EN 1005-4 – EN 14118 - EN 12100– EN 13850 – EN 13857 – EN 14118 - EN 14120 – EN 60204-1 – EN 11161 – EN 61310-1 - EN 13849-1 – EN 13849-2 – EN 60204-1

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Arenys de Munt (Barcelona)-SPAIN
Date: 2021/08

- Transport and unloading the machine

Due to the fragility of some components of the machine, wood packaging is required with reinforced board to attach it to the base by bolts through the openings in the rubber feet.

To keep the weight of the load well balanced, moving the punch cutting head to halfway across its run before proceeding to pack is recommended.

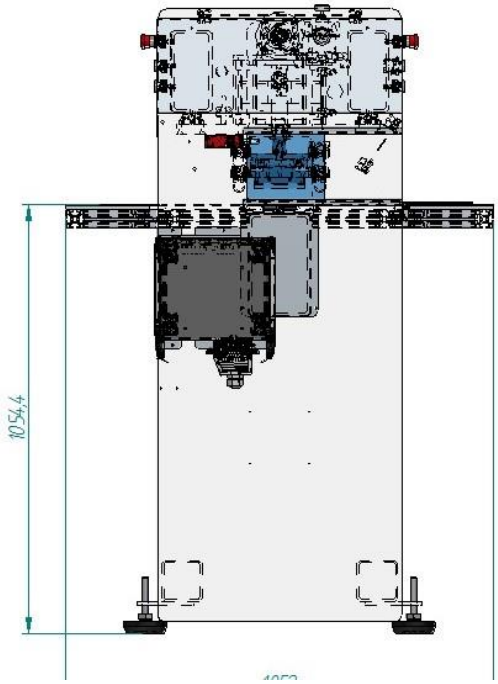
For sea transport, the linear rails and drive screw located at the bottom of the cutting head must be lubricated and full plastic cover provided.

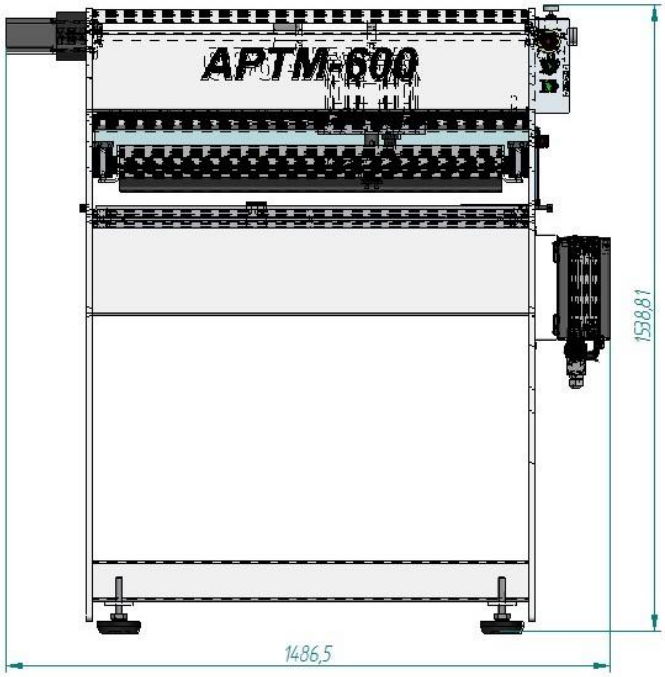
A pallet truck must be used to move the machine, lifting it by the bottom cross bars of the bench just as shown in the picture.

Fit the four rubber feet and proceed to level.

- **Dimensions and weights:**

- Total weight: 314 Kg
- Measurements: 1487x1060x1538 mm.

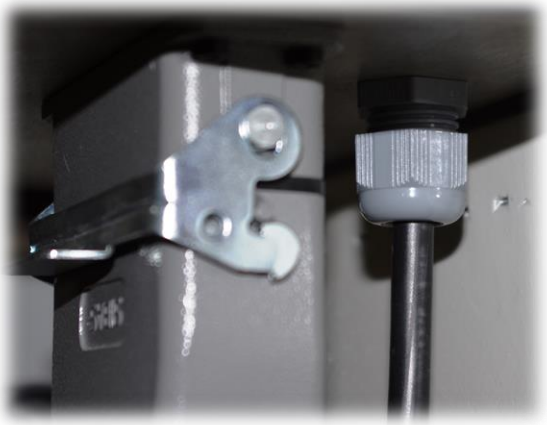




- **Installation and connection:**

Provide compressed air through a tube with a minimum interior diameter of 8 mm., connected to the intake.

NOTE:
One must bear in mind that the air consumption of this punch cutter is 280 litres/minute.
Connect the power cable to the control board at 230v monophasic.



NOTE:
It is recommendable for the air and power lines to be run from above to prevent the staff tripping or falling.

- ## Description:

Pneumatic punch cutter with a motorised head to cut conveyor belts in zigzag, with ball screw activated by a stepper motor and positioning control. Pressure and punch cutting time control.

Exchangeable cutting heads for different cutting geometries, with the possibility of programming diverse forward steps.

Support bench with material positioning guides.

This punch cutter is especially designed to cut thermoplastic materials with interior fabric.

- Technical characteristics:

Dimensions	1487 x 1060 x 1538 (l x w x h)
Weight	314 Kg
Max. thickness	10 mm.
Voltage	1 x 230
Power	0.40 kW
Max. pressure	9 bar
Belt width	620 mm.
Advance speed	1 meter/minute

- Using instructions:

WARNING:
HAND AND ARM TRAPPING HAZARD WITH THIS DEVICE DUE TO THE MOVEMENT OF THE CUTTING HEAD. GREAT CARE MUST ALSO BE TAKEN BETWEEN THE CUTTING HEAD AND SUPPORT PLATE, AS THERE IS THE DANGER OF LIMBS BEING SEVERED.

Once the machine electrical and air connections are made, proceed to start it up using the ON switch.

Check that the regulator pressure is between 2 and 6 bar according to the cutting head installed.

Safety Systems and messages.

This punch cutter has been equipped with the following safety systems:

2. EMERGENCY STOP

This system allows an emergency stop to be performed at any time using the two push buttons located at both ends of the bench.

Message: EMERGENCY LOCK PUSH BUTTON

To deactivate it, we must unlock the push button and then press RESET to return the head to the starting point.

2. TREAD BAR

This device does not allow engagement of the cutting head if the bar holding the belt is not lowered.

Message: TREAD BAR

To deactivate it, all one need do is lower the bar and press START.

3. DOOR OPEN

This device detects that the rear door of the blade head is open.

Message: DOOR OPEN

The door must be closed to deactivate it.

4. CYLINDER DETECTOR

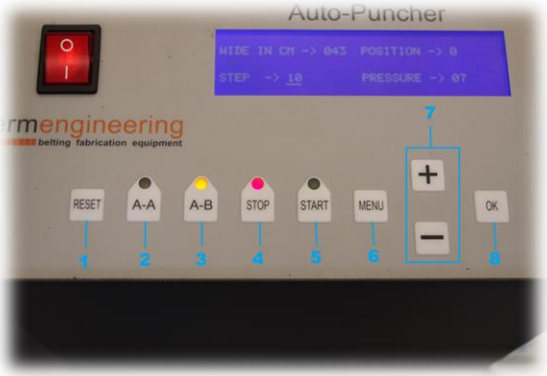
This device does not allow displacement of the head because it detects that the cutting cylinder is not raised. This may happen due to lack of air or failure of the detector.

Message: CYLINDER DETECTOR

To deactivate it, provide the machine with air or replace the detector.

Programming.

We must know the functions of the push buttons on the board to program the punch cutter.



1. **RESET**

   This must be pressed after an emergency stop or position the head at the starting point after STOP.

2. **A-A**

   Selection of the A-A program
   This program is used in most cases, to always operate on guide rail and cut the belts performing the first end by inserting it on one side of the bridge and the second end on the other side, or to cut series continuously.

3. **A-B**

   Selection of the A-B program to do individual operations.

4. **STOP**

   Allows the cutting process to be halted at any moment, to change the time or cutting pressure, for example.
   On pressing START, it will continue the process without losing the positioning memory.

5. **START**

   Starts the cutting process or acts to reboot following a stop.

6. **MENU**
   This button is to jump from one programming field to another and thus amend the values:
   Belt width
   Step
   Cutting time

7. **+ / -**

   To increase or decrease the marked field values.

8. **OK**

   To validate the modified value. Any modification must always be validated.

Belt cutting measurements for the different punches.

120 x 15 90 º…… 135 mm. Longer

Changing punch

⚠WARNING:
When changing punches, switching off the equipment at the OFF switch is recommended for greater safety.

Open the sliding door.

Loosen the 2 bolds using a 13mm. spanner.

Take out the punch and insert the new one.

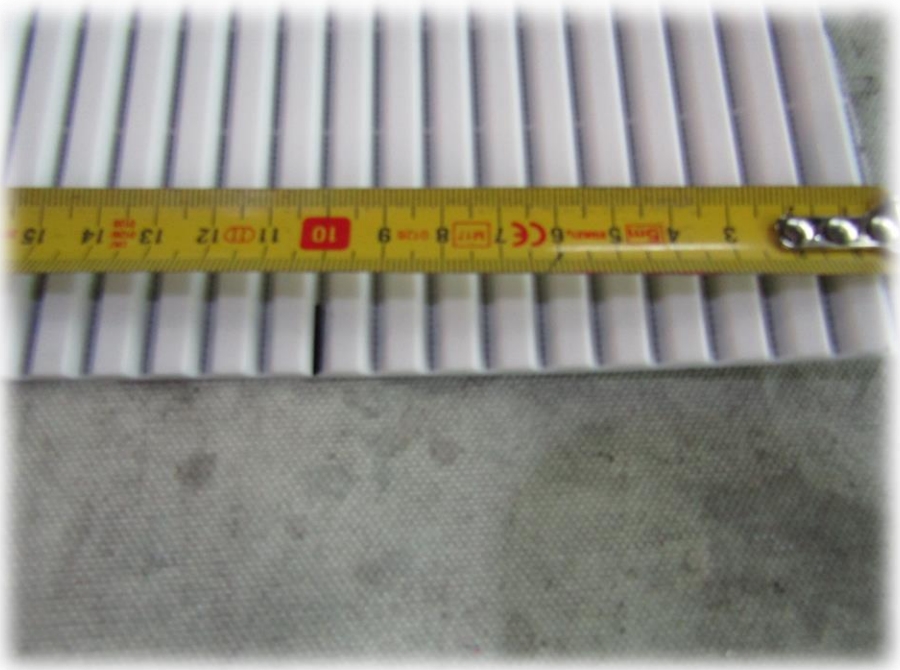
Retighten the 2 bolts.
Close the sliding door and program the correct step in the MENU …. STEP … OK

NOTE:
The cutting pressure must be adjusted for each type of punch or material.

If not, excess pressure may cause the blades to break or premature wear of the cutting aluminium board.

PUNCH CUTTING A-A direct finger:

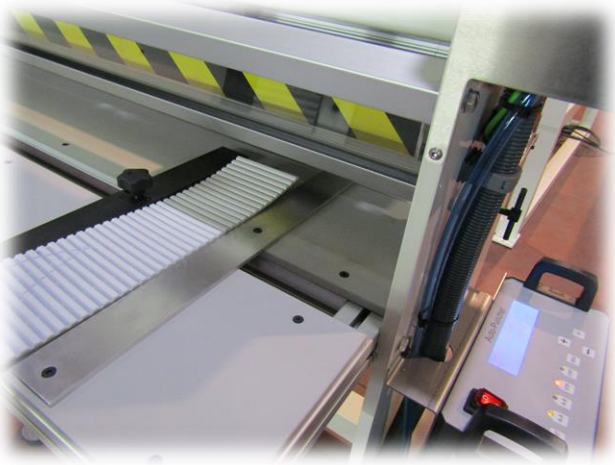
Write with pencil a line at 100mm approx. from the beginning of the belt.



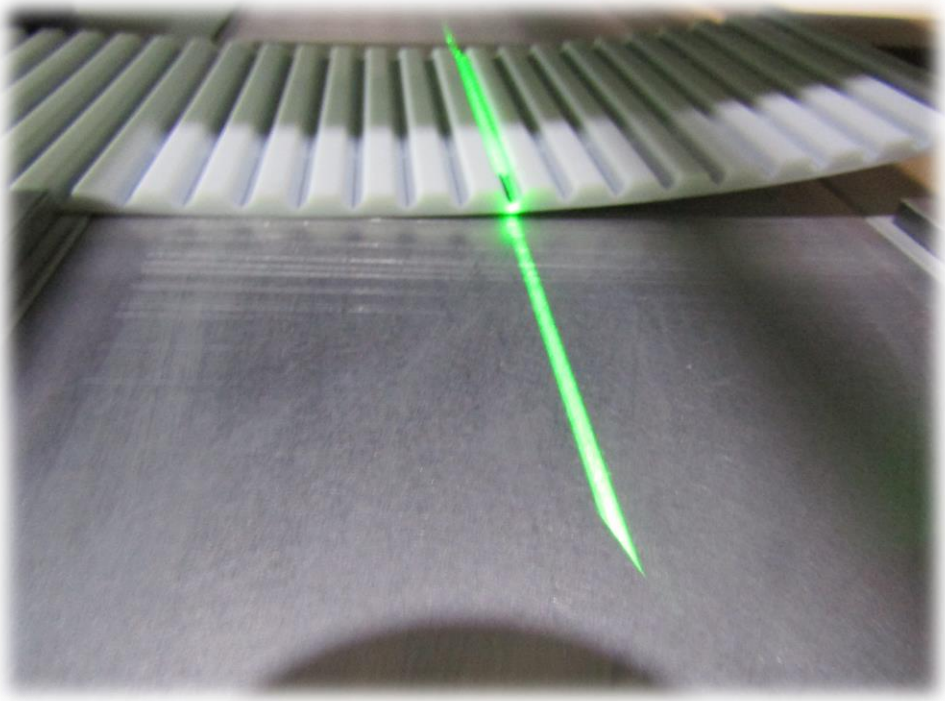
Take this line like 0 of total length of final endless measure.

Then pencil in the exact measure required. (In this case 540mm)

Then place the belt to left side of machine, under the tread bar and adjust the table guide.



Introduce the belt until the mark made coincides with laser line, ensuring it is fully in contact with the guide.



Lower the tread bar using the down push button.

Check that belt still in correct position after down the bar.
Select the A-A function if not activated.

Us the + / - buttons to adjust the belt width in centimeters and then press OK.

Check the STEP is correct. If not, use the MENU button to skip the STEP and input the required value with + / - and then press OK.

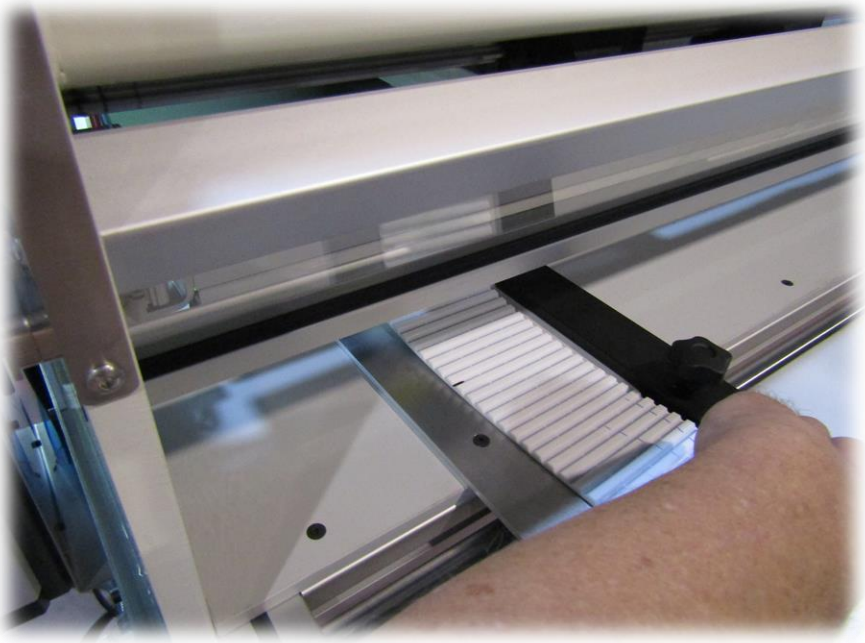
NOTE:
The programmed values will not be lost, even if the equipment is switched off. The program always memorises the last values input.

Press START to begin cutting at the first end.

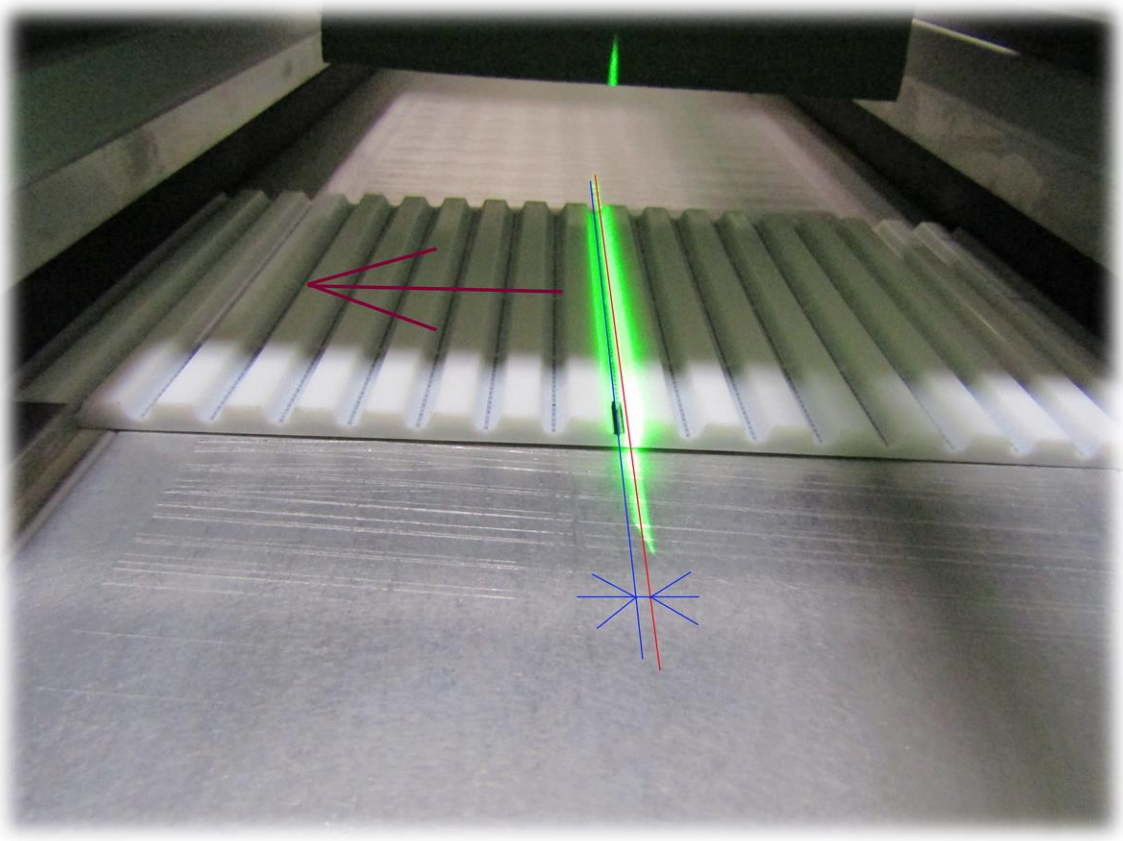
NOTE:
No programmed value may be changed during the cutting process, except the cutting time. To do so, press STOP, change the value, and then press START to continue.

Once the first cut is completed, release the belt by pressing the bar raise button.

Place the second end of the belt by the Right side by the guide and position.



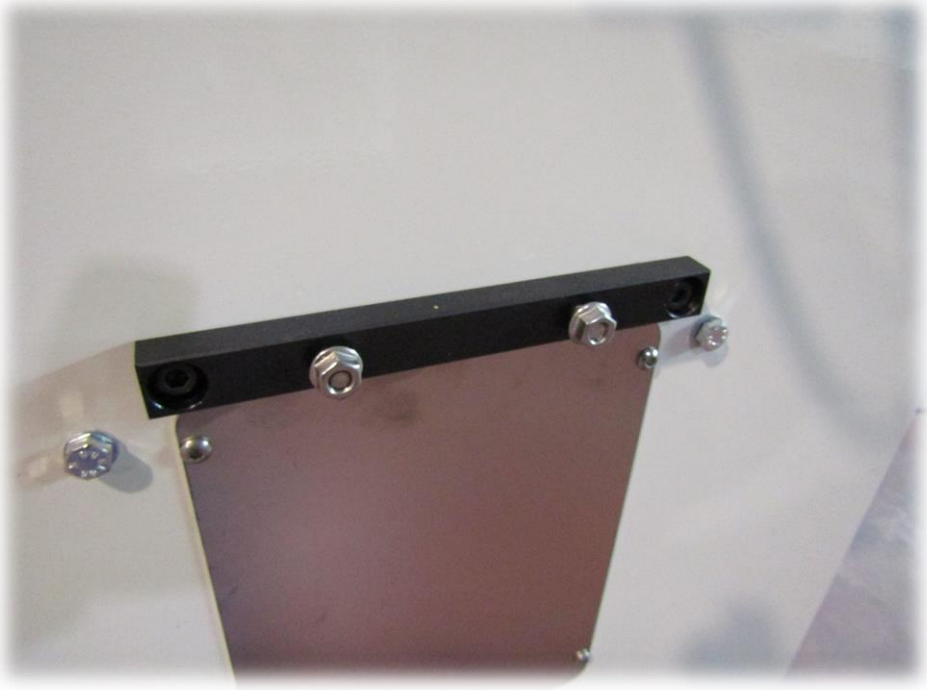
And the pencil line of the belt just by the laser mark or 1/2mm more inside depending on the thickness belt.



Lower the tread bar using the drop push button and press START.

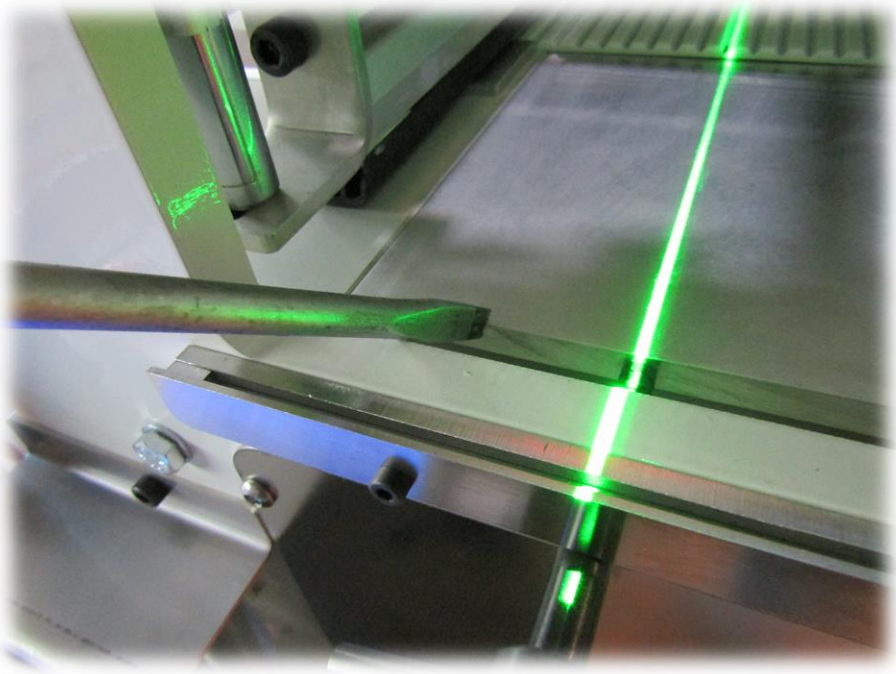
Changing support plate:

The black cover is removed to change or turn the support plate.
For this operation, use an Allen key 6mm.



Fully remove the plate displacement nut.

Use a screwdriver to lever in the jig opening to lift and withdraw the plate.



Remove the plate from the back side of the frame.

Maintenance and care:

- Keep the screw and linear guides dust free and well lubricated with low density, low silicone content lubricant oil.
- Replace the blades or the polypropylene bench when imperfect cuts are observed.
- Periodically move the polypropylene base 2 or 3 mm. to even out the wear.
- Empty out the water and clean the air intake filter basin if there is condensation in the line.

- Troubleshooting:

The board does not turn on.

Check whether the switch LED turns red to determine a possible problem in the electric power line to the machine.

The head does not move at all.

Check that the cylinder is upward and that the grid (cylinder cutting detector) is on.

The head moves but does not cut.

Check that the electro-valve is working and that the connector LED is on.
Check that the regulator pressure is above 2 bar.
Check that the cutting time is programmed between 05 and 10.

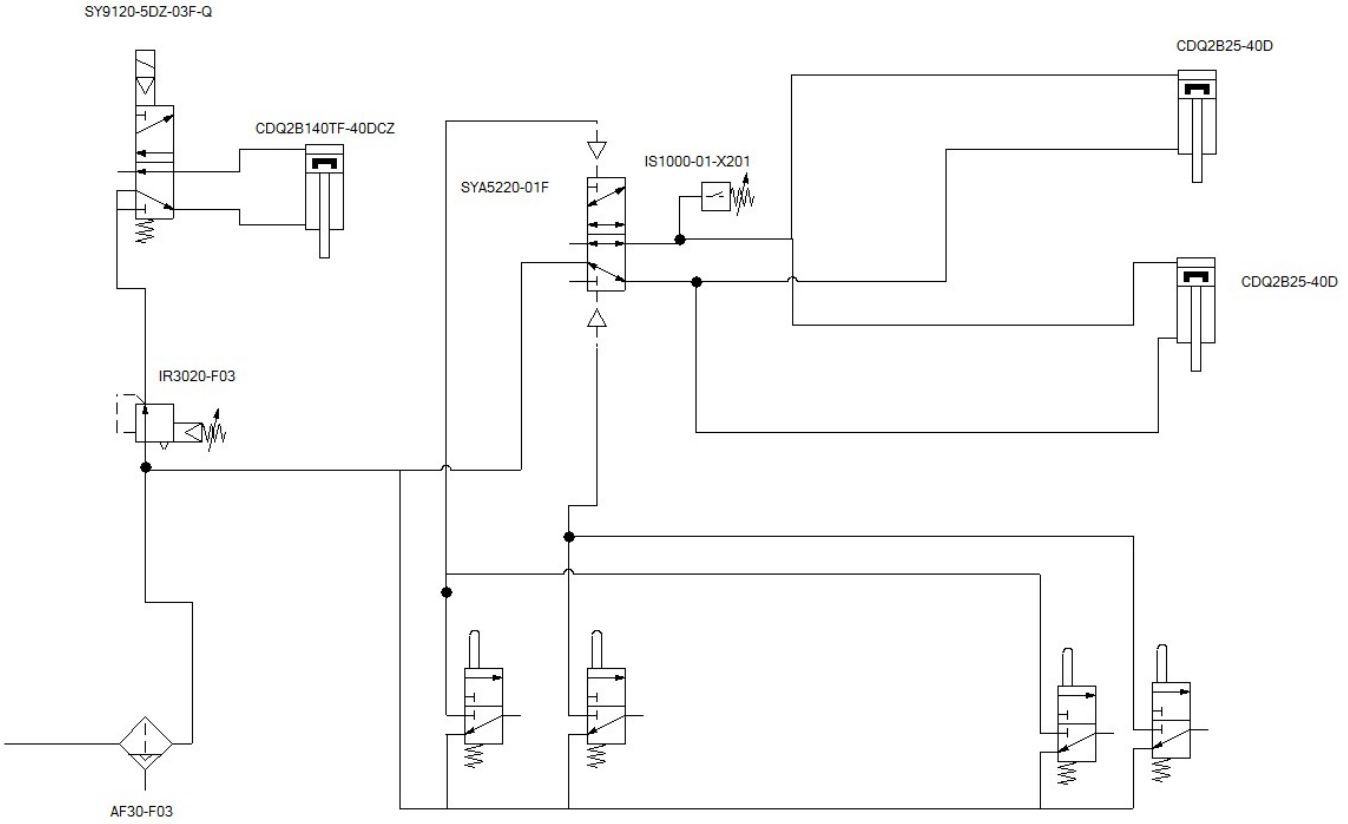
The belt is not cut across the full width.

Check that the intake pressure does not drop during cutting due to compressed air supply shortage.

Check the thickness of the polypropylene plate.

NOTE: In the event of any problem, pay special attention to the messages on the screen to find what is wrong.

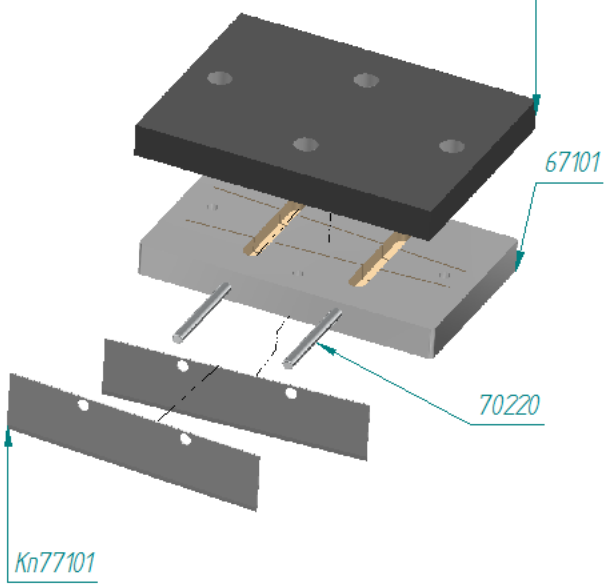
- **Pneumatic scheme:**



- **Spare parts:**

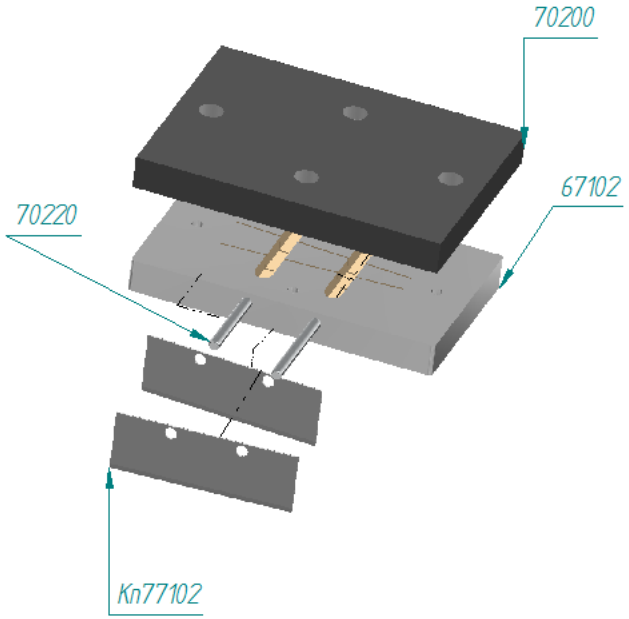
PUNCHING PLATE 120X15

Number	Part name	Units
Kn77101	cuchilla 0.7x122xdoble bisel normal.par	2
70200	Distancial troquel 120 DE.par	1
	m_443_11_ae_v0.par	1
70220	Pasador troquel.par	2
67101	TROQUEL-120x15.par	1

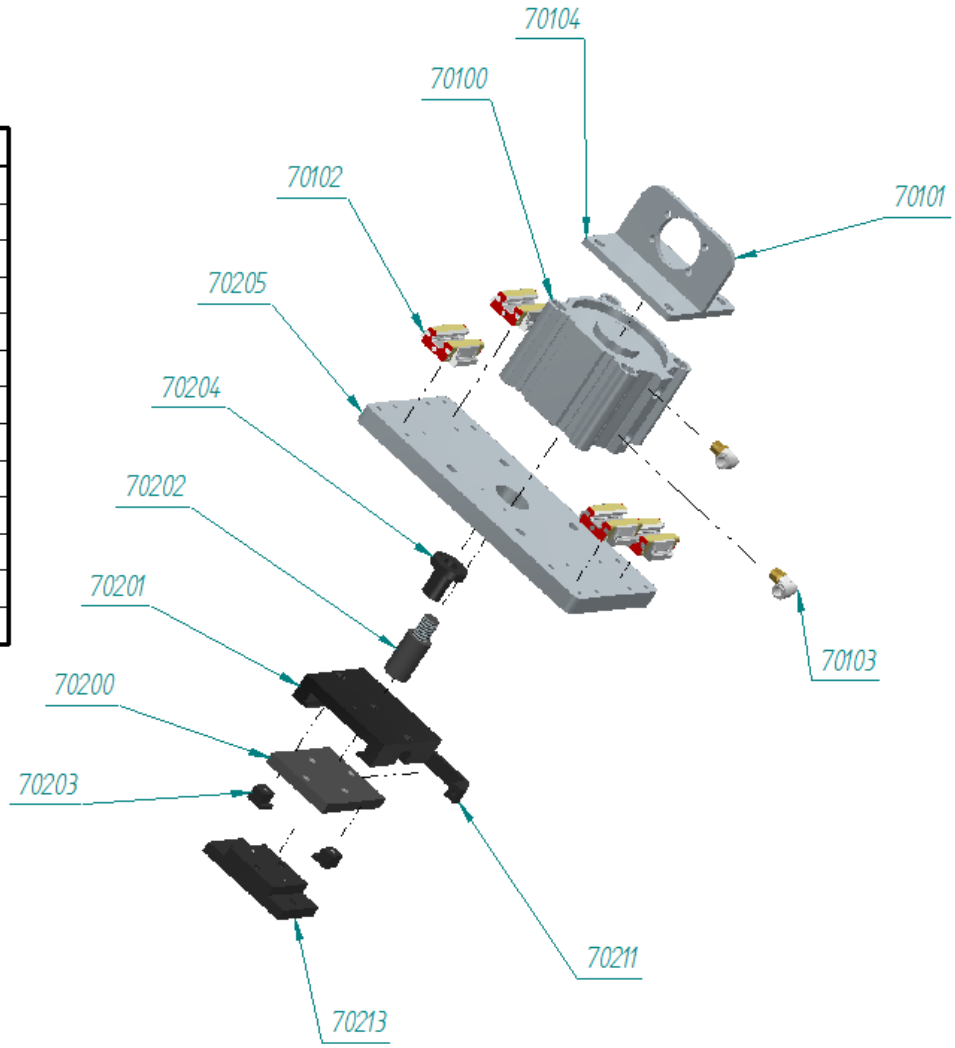


PUNCHING PLATE 80X10

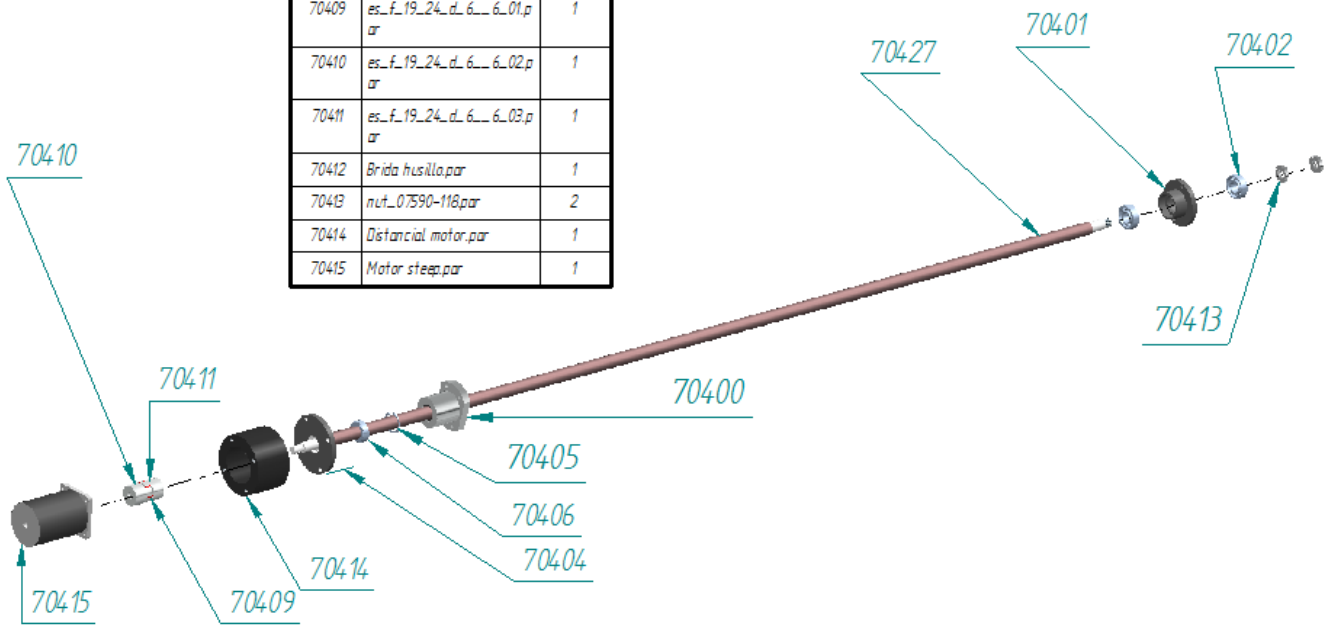
Number	Part name	Units
Kn77102	cuchilla 0.7x82xdoble bisel normal.par	2
70200	Distancial troquel 120 DE.par	1
70220	Pasador troquel.par	2
67102	TROQUEL-80X10.par	1



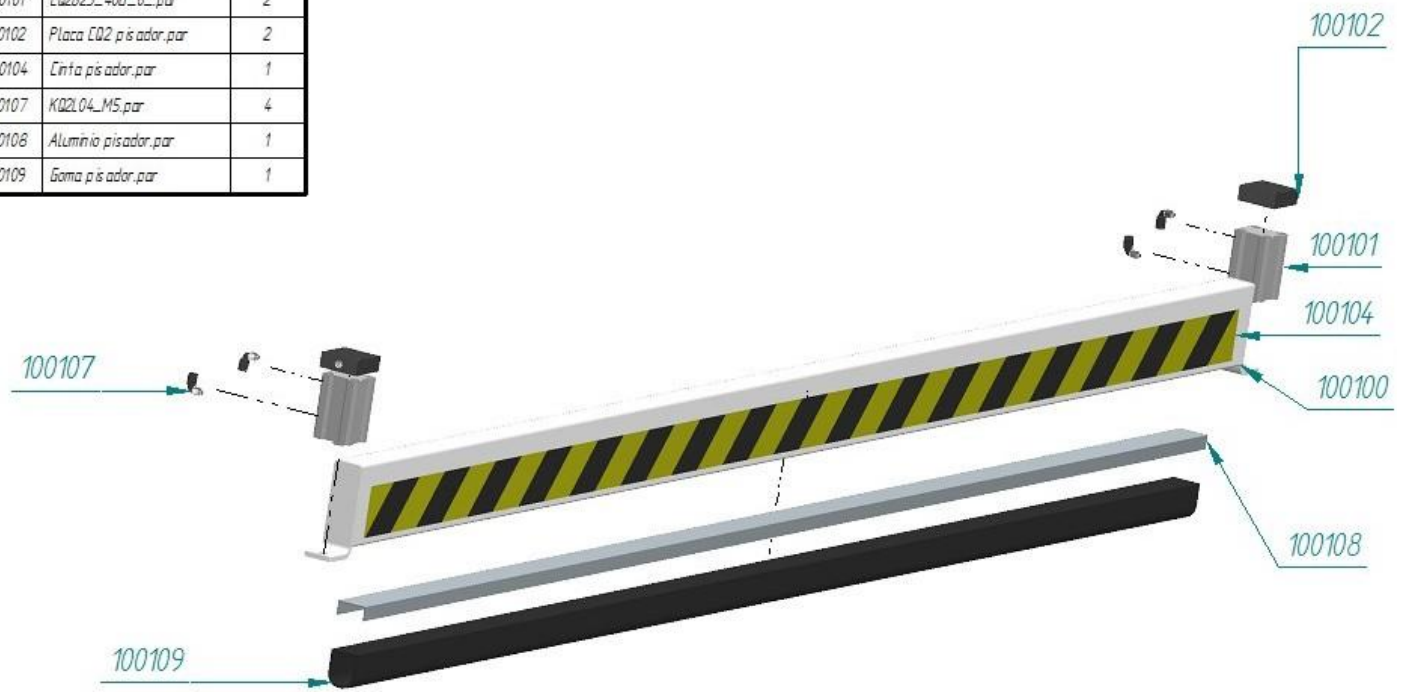
Number	Part name	Units
70101	Ala brida.par	1
70201	Base distancial.par	1
70205	Base patines.par	1
70100	CDQ2B140TF-400DCZ.asm	1
70200	Distancial troquel 120 DC.par	1
70202	Enlace troque AFP.par	1
70103	KQ2L12-03S.par	2
70211	m_443_11_ae_v0.par	1
70102	Patin Hiwin 20.par	4
70203	Pestaña troquel.par	2
70213	Postizo troquel.par	1
70204	Soporte guia cabeza.par	1
70104	Tapa cilindro.par	1



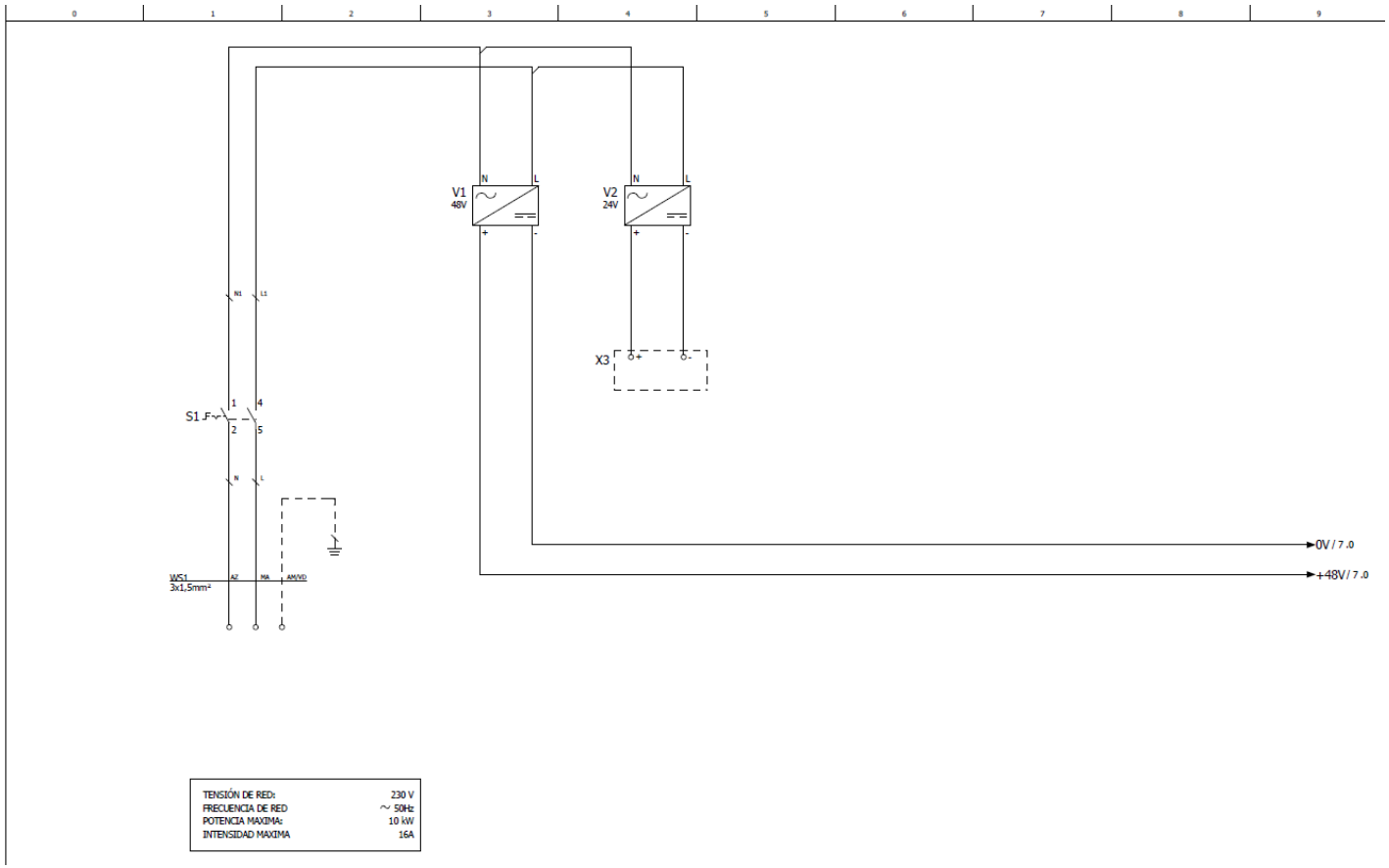
Number	Part name	Units
70400	Brida husillo tuerca.asm	1
70401	BRIDA BANCADA 2.par	1
70402	Bearing_DIN_628_1_1993_7204_B_v9.00.par	2
70404	BRIDA BANCADA.par	1
70405	Guard_ring_B_DIN_472_40x1.75_A_v10.00.par	1
70406	6004 20-42-12.par	1
70427	Husillo DC2000.par	1
70408	es_f_19_24_d_6___6.asm	1
70409	es_f_19_24_d_6___6_01.par	1
70410	es_f_19_24_d_6___6_02.par	1
70411	es_f_19_24_d_6___6_03.par	1
70412	Brida husillo.par	1
70413	nut_07590-118.par	2
70414	Distancial motor.par	1
70415	Motor steep.par	1

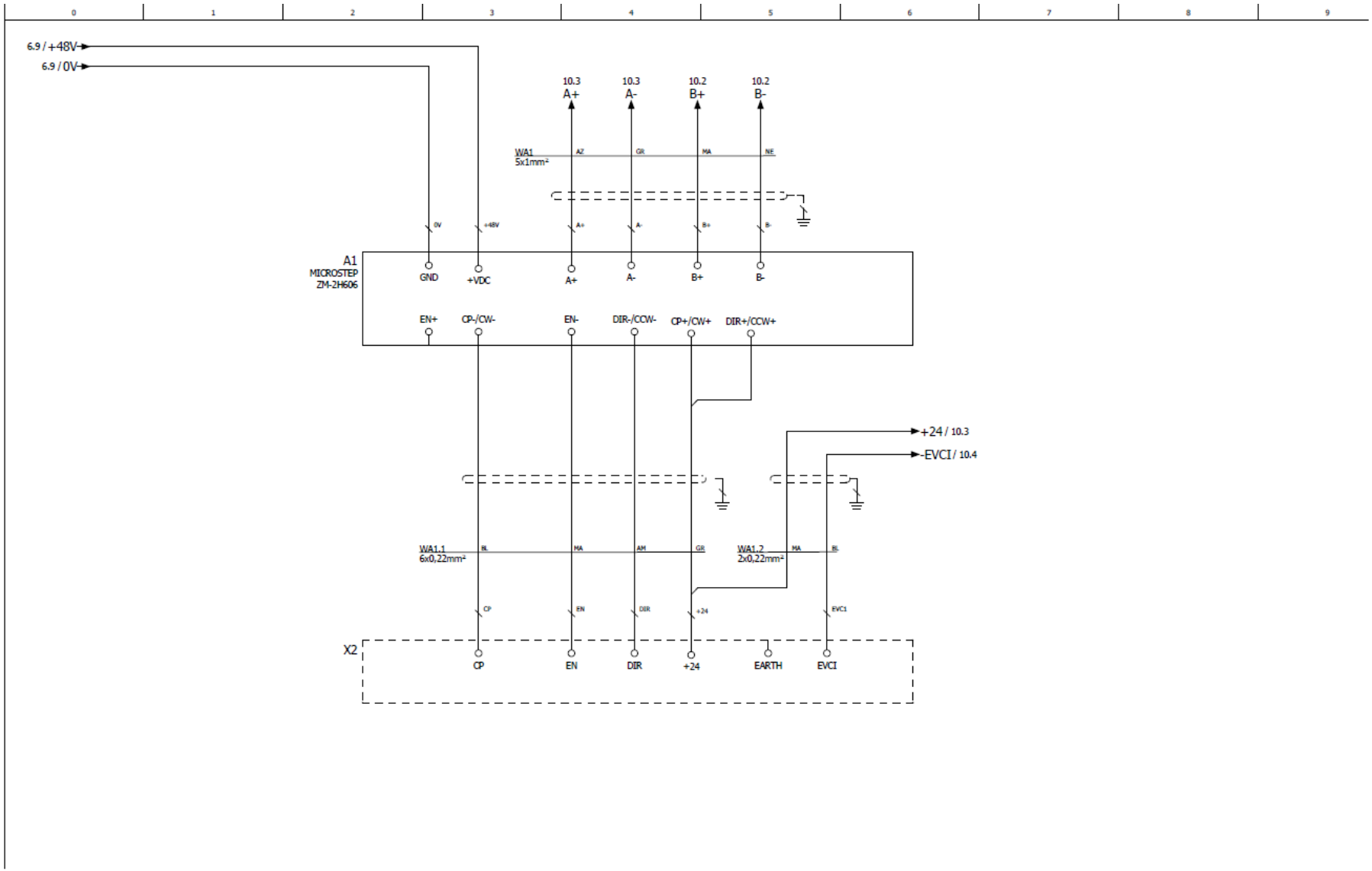


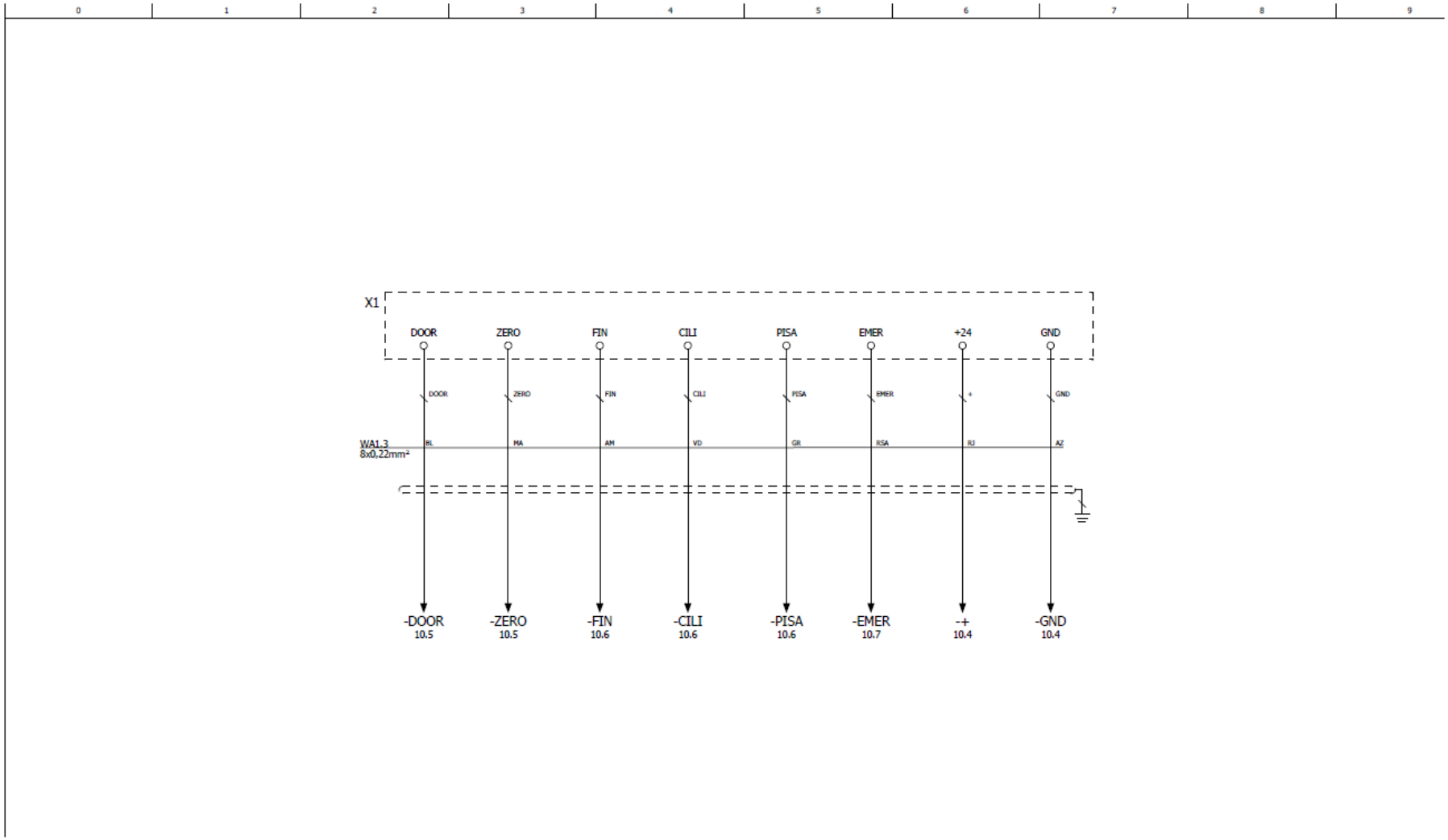
Number	Part name	Units
100100	Barra pisador.par	1
100101	CQ2B25_400_0_.par	2
100102	Placa CQ2 pisador.par	2
100104	Cinta pisador.par	1
100107	KQ2L04_M5.par	4
100108	Aluminio pisador.par	1
100109	Goma pisador.par	1



- **Electrical schemes**




6.9 / +48V
6.9 / 0V
10.3 A+
10.3 A-
10.2 B+
10.2 B-
WA1 5x1mm²
AZ
GR
MA
NE
0V
+48V
A+
A-
B+
B-
A1
MICROSTEP
ZM-2H606
GND
+VDC
A+
A-
B+
B-
EN+
CP-/CW-
EN-
DIR-/CCW-
CP+/CW+
DIR+/CCW+
+24 / 10.3
-EVCI / 10.4
WA1.1 6x0,22mm²
BL
MA
AM
GR
WA1.2 2x0,22mm²
MA
BL
CP
EN
DIR
+24
EVCI
X2
CP
EN
DIR
+24
EARTH
EVCI


0
1
2
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5
6
7
8
9
X1
DOOR
ZERO
FIN
CILI
PISA
EMER
+24
GND
DOOR
ZERO
FIN
CILI
PISA
EMER
+
GND
WA1.3
8x0,22mm²
BL
MA
AM
VD
GR
RSA
RJ
AZ
-DOOR
10.5
-ZERO
10.5
-FIN
10.6
-CILI
10.6
-PISA
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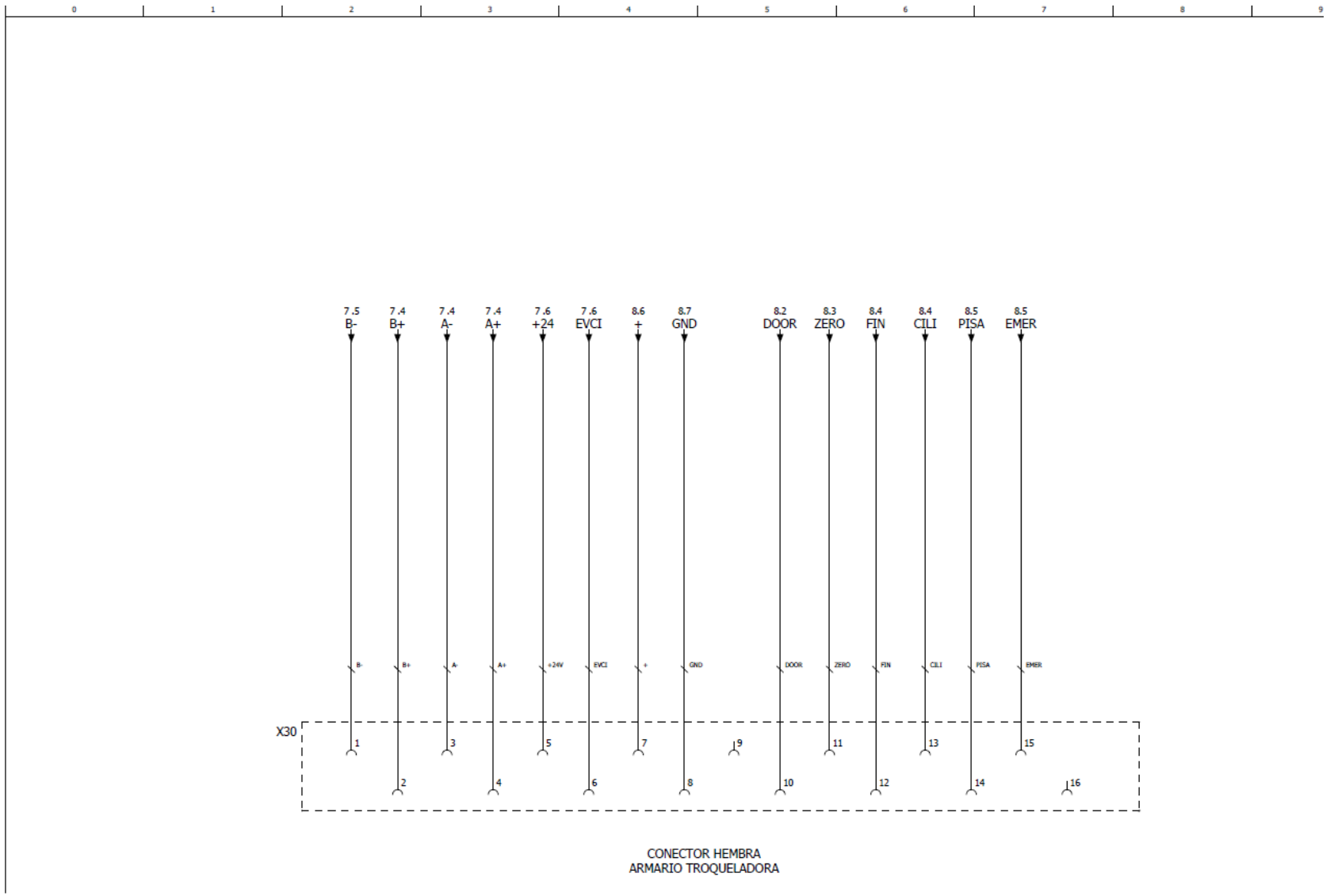
-EMER
10.7
-+
10.4
-GND
10.4


0
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4
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6
7
8
9
7.5 B-
7.4 B+
7.4 A-
7.4 A+
7.6 +24
7.6 EVCI
8.6 +
8.7 GND
8.2 DOOR
8.3 ZERO
8.4 FIN
8.4 CILI
8.5 PISA
8.5 EMER
X30
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3
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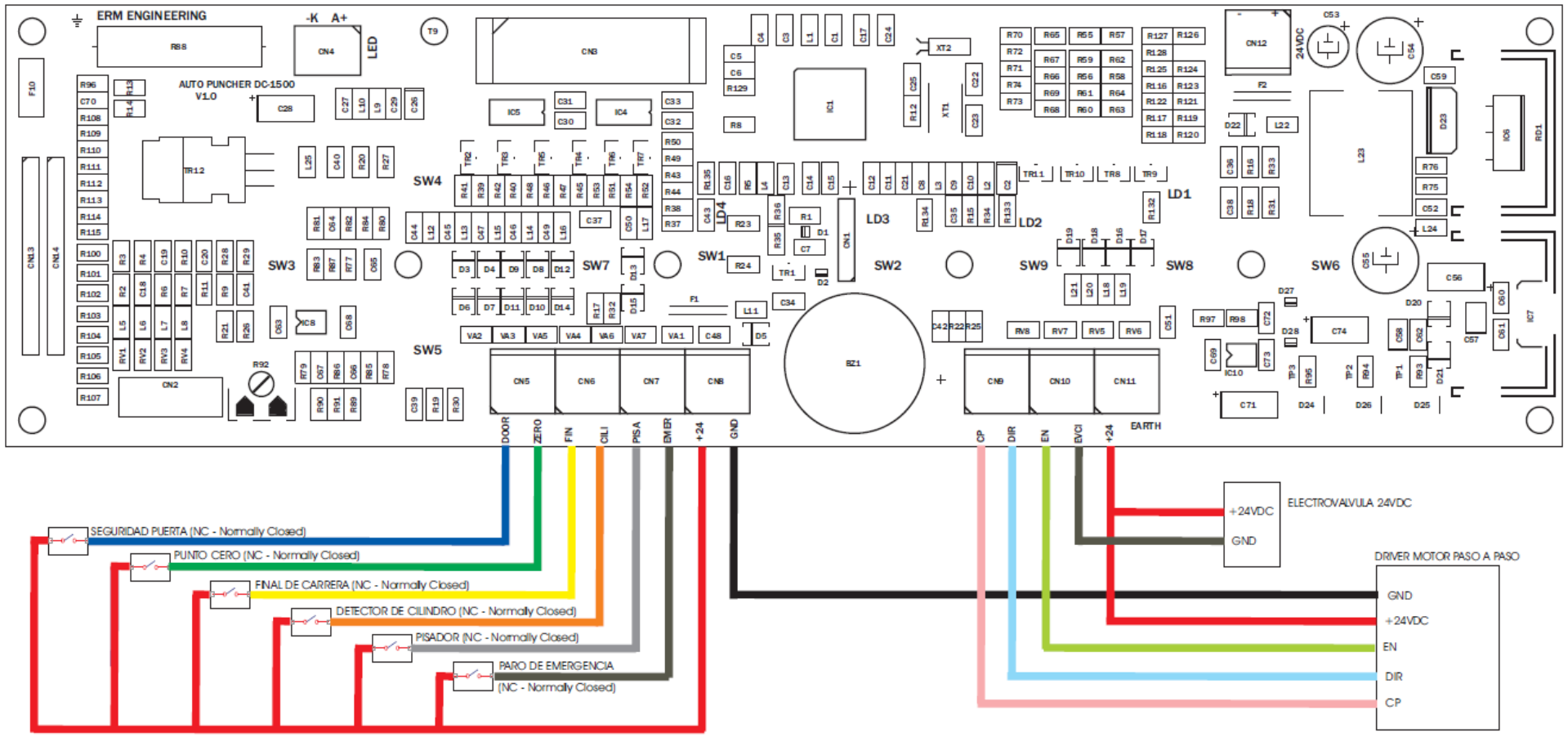
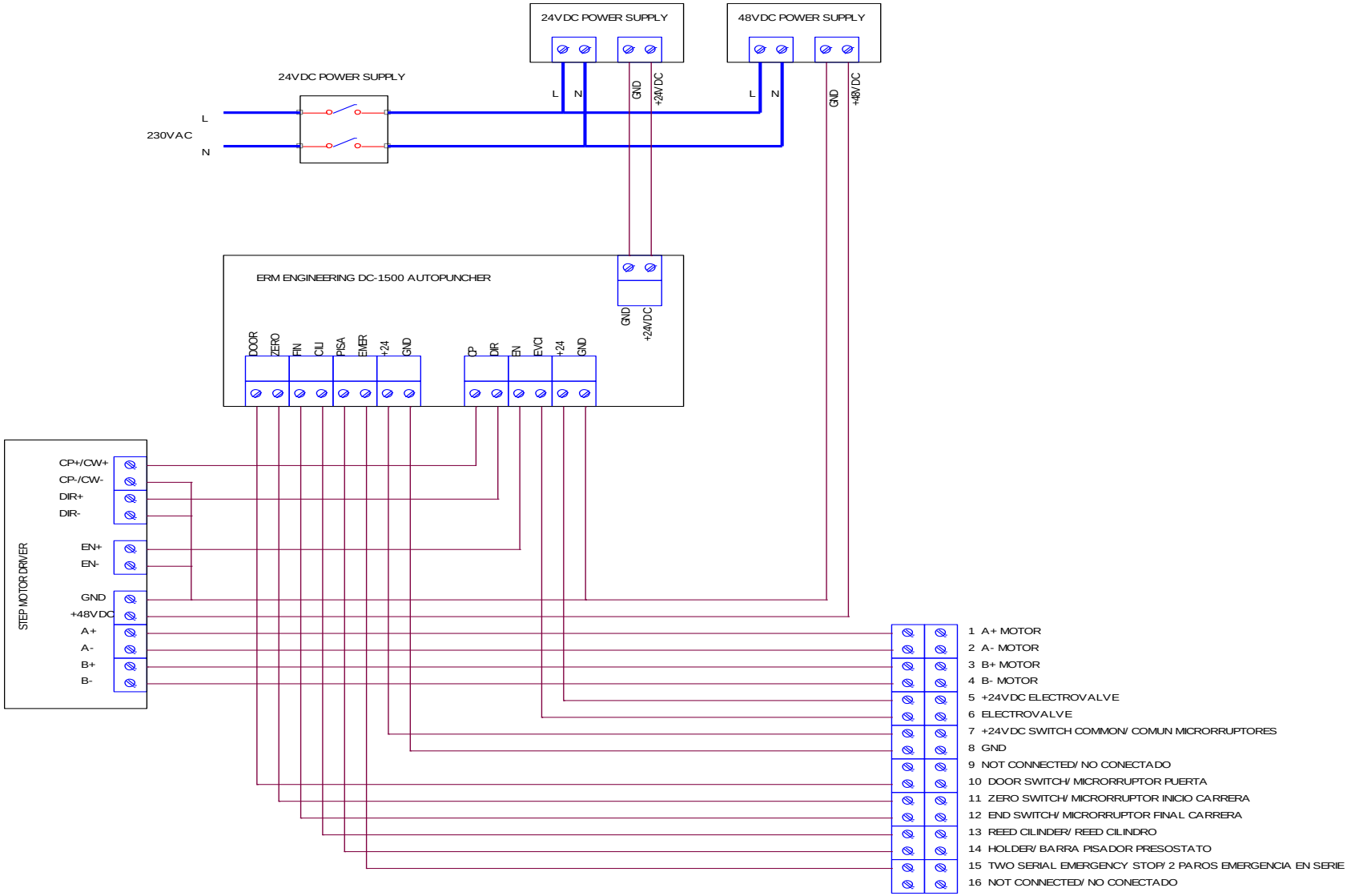
11
12
13
14
15
16
CONECTOR HEMBRA
ARMARIO TROQUELADORA


ERM ENGINEERING
AUTO PUNCHER DC-1500
V1.0
SW1
SW2
SW3
SW4
SW5
SW6
SW7
SW8
SW9
LD1
LD2
LD3
LD4
DOOR
ZERO
FIN
CILI
PISA
EMER
+24
GND
CP
DIR
EN
EVCI
+24
EARTH
SEGURIDAD PUERTA (NC - Normally Closed)
PUNTO CERO (NC - Normally Closed)
FINAL DE CARRERA (NC - Normally Closed)
DETECTOR DE CILINDRO (NC - Normally Closed)
PISADOR (NC - Normally Closed)
PARO DE EMERGENCIA
(NC - Normally Closed)
+24VDC
GND
ELECTROVALVULA 24VDC
DRIVER MOTOR PASO A PASO
GND
+24VDC
EN
DIR
CP


24VDC POWER SUPPLY
48VDC POWER SUPPLY
24VDC POWER SUPPLY
230VAC
L
N
L
N
GND
+24VDC
L
N
GND
+48VDC
ERM ENGINEERING DC-1500 AUTOPUNCHER
GND
+24VDC
DOOR
ZERO
FIN
CIL
PISA
EMER
+24
GND
CP
DIR
EN
EVCI
+24
GND
STEP MOTOR DRIVER
CP+/CW+
CP-/CW-
DIR+
DIR-
EN+
EN-
GND
+48VDC
A+
A-
B+
B-
1 A+ MOTOR
2 A- MOTOR
3 B+ MOTOR
4 B- MOTOR
5 +24VDC ELECTROVALVE
6 ELECTROVALVE
7 +24VDC SWITCH COMMON/ COMUN MICRORRUPTORES
8 GND
9 NOT CONNECTED/ NO CONECTADO
10 DOOR SWITCH/ MICRORRUPTOR PUERTA
11 ZERO SWITCH/ MICRORRUPTOR INICIO CARRERA
12 END SWITCH/ MICRORRUPTOR FINAL CARRERA
13 REED CILINDER/ REED CILINDRO
14 HOLDER/ BARRA PISADOR PRESOSTATO
15 TWO SERIAL EMERGENCY STOP/ 2 PAROS EMERGENCIA EN SERIE
16 NOT CONNECTED/ NO CONECTADO