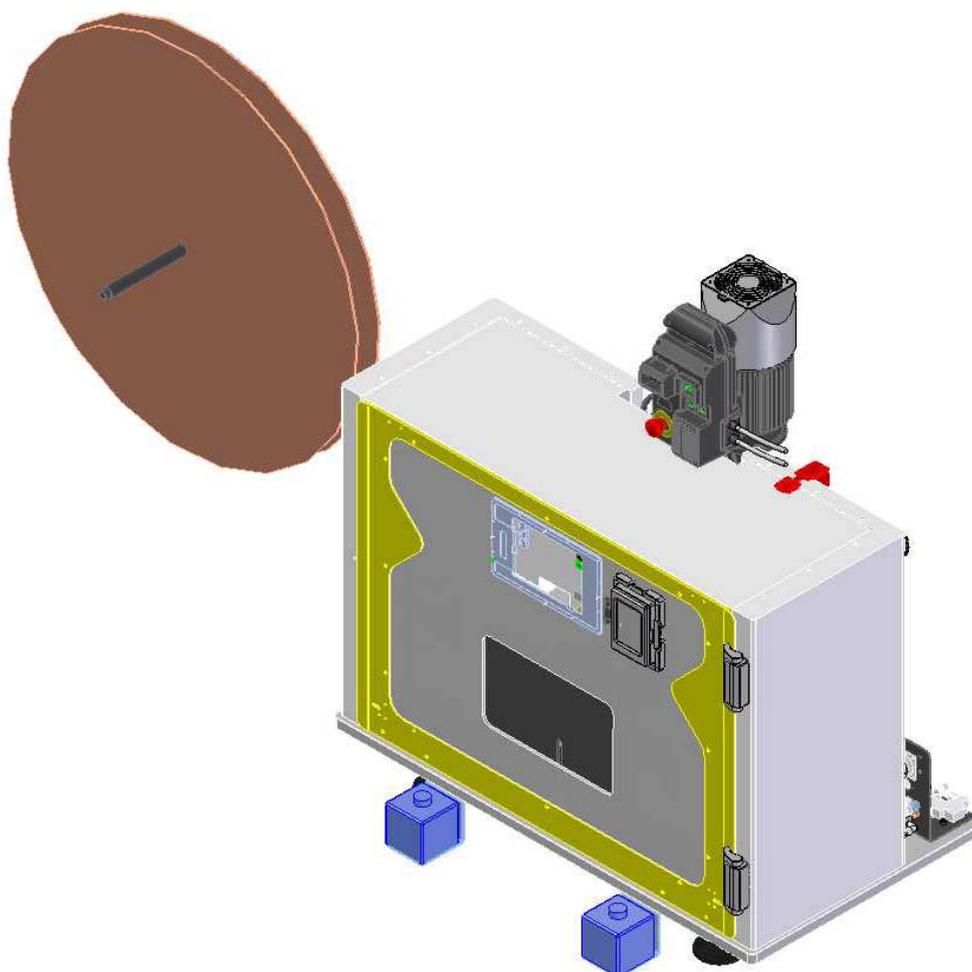


OPERATING MANUAL 7_HSD BODY STATION 90°

CAUTION! Start-up and operation of Mecal equipment run is reserved for qualified personnel who have understood and will adhere to the contents of this manual. Any operations not described in this manual could cause damage to persons or affect the functionality of equipment itself.





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Preferred by Professional EDS Specialists

These instructions were created in November 2016 and may be subject to change. MECAL also declares that the images shown in this manual may not be updated with technical changes made to products for the sake of improvements or special requests.

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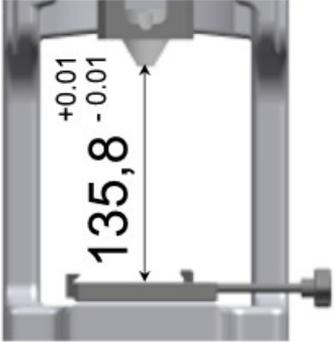
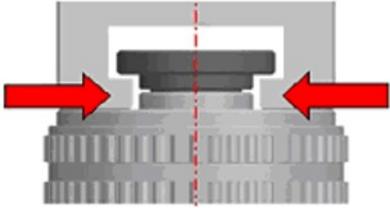
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1) Introduction

Mecal guarantees the safety of its production equipment only if the machine and its accessories are used in full compliance with safety regulations and with the following use and maintenance manual. Mecal excludes all liability for any changes made and/or tampering which endangers the safety of the machine. This document provides support for the installation, start-up up, use and maintenance of the product in question. It complements but does not replace other documents, data sheets or diagrams. No more than one operator can work on each piece of equipment.

CAUTION:
Carefully read the instructions before installing and operating equipment.

1.1) Important warnings

Phase	Operation
<ul style="list-style-type: none"> Check correct press crimping height setting at bottom dead centre BDC equal to 135.8mm. The magnum installed on-board equipment should NOT be installed under other presses. 	
<ul style="list-style-type: none"> Carefully check alignment between the axis of the press and the work tool. 	
<ul style="list-style-type: none"> Position the adjusting ring according to the instructions contained on the identification plate. 	
<p>Note: After having installed the applicator, have the press perform a complete cycle with a step by step process, to check that:</p> <ul style="list-style-type: none"> There are no impediments to free applicator operation The terminal is correctly positioned, aligned on the anvil and with crimping and cutting parts 	

2) General instructions

2.1) Use

The Body Station, the 7th step on the Mecal HSD (High Speed Data) wire production line is composed of:

- One P107C press
- One special magnum applicator
- One strip cutter
- One vision system composed of three video cameras

Thanks to its vision system, the machine performs a check of the correct positioning and integrity of the pins inside the insulator, also verifying that the body has been fitted on the insulator.

Once the control phase has been passed, the machine proceeds with terminal crimping and squashing.

The electronic equipment enables just in time viewing of the verification process at the start of the cycle.

Process quality is controlled by the optical fibres and by the vision system which verify the correct position of wires, also from a load cell present on the press able to monitor every individual crimp.

The station is equipped with a pneumatic casing which permits the operator to insert the wire, completely closing the work area after activation of the two-hand cycle start switch.

Equipment is intended for use in industrial environments.

The machine can be used for cold metal working only or, more specifically, solely for crimping applications.

Its use for any application other than specified is **STRICTLY PROHIBITED**.

2.2) Technical information

HSD Body Station

ID	BD010
AIR PRESSURE	5-7 BAR
DIMENSIONS (mm)	W1530Xh980xD500
DIMENSIONS (")	W60.23Xh38.58xD19.68
WEIGHT	160Kg
POWER SUPPLY	110-240V 50-60Hz
CABLE CROSS-SECTION	HSD Dacar® 535-566
CYCLE TIME	approximately sec

LMP Applicatore Magnum Laterale Pneumatico

Model: LMP

Work height at BDC: 135.8mm

Press stroke: 40 / 30mm

Terminal pitch: adjustable cylinder

Terminal thickness: 0.6mm

Wire type: 535-566

Supply system: air 5/6 Bar

Weight: approximately 16 Kg

Dimensions: W378 x H200 x D525mm

2.3) Inspection upon delivery

The applicator is delivered in a separate package containing:

- One Mini-applicator
- Crimping samples created for testing
- CD containing use and maintenance instructions

(Optional) upon request:

- Spare parts kit
- Photo of crimped terminal section (attached to file on CD)
- Capability (attached to file on CD)

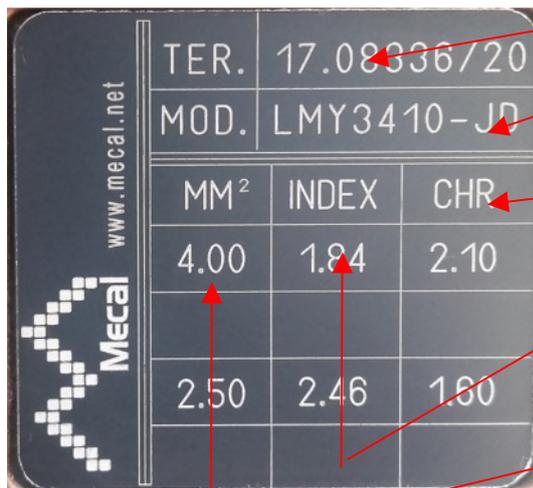
Upon delivery:

-  Make sure that there is no damage to the applicator and that there are no missing parts, checking the accompanying document.
-  If any defects are detected, inform Mecal no later than 10 days from the date of receipt.



Packaging must be disposed of according to current regulations, not release into the environment: contact authorised companies for disposal.

2.4) Machine identification



TER. 17.08336/20		
MOD. LMY3410-JD		
MM ²	INDEX	CHR
4.00	1.84	2.10
2.50	2.46	1.00

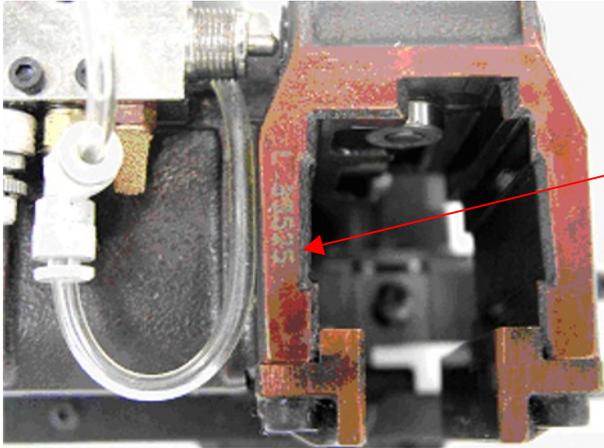
Client or supplier terminal P/N

Applicator model relative to terminal P/N

Crimping height (CHR)

Adjusting ring position (INDEX) referring to crimping height (CHR)

Minimum and maximum wire cross-section



Mini-applicator serial number



TECHNICAL DATA SHEET FOR MINI-APPLICATOR	
Model	...
Serial Number	...
...	...

BOM (Bill of Materials)		
Part No.	Description	Quantity
...

CD with serial number and documentation complete with Data Sheet, BOM and exploded diagrams

2.5) Safety requirements

When equipment is in use it must be equipped with all safety devices. Before performing any cleaning or maintenance operations



Set the main switch to position "0".



Cut off power to the line switch and disconnect the equipment power cable.



Announce operations on the line switch.



CAUTION: read the following carefully:

- The Mecal press complies with requirements if a Mecal type applicator or die is used or installed.

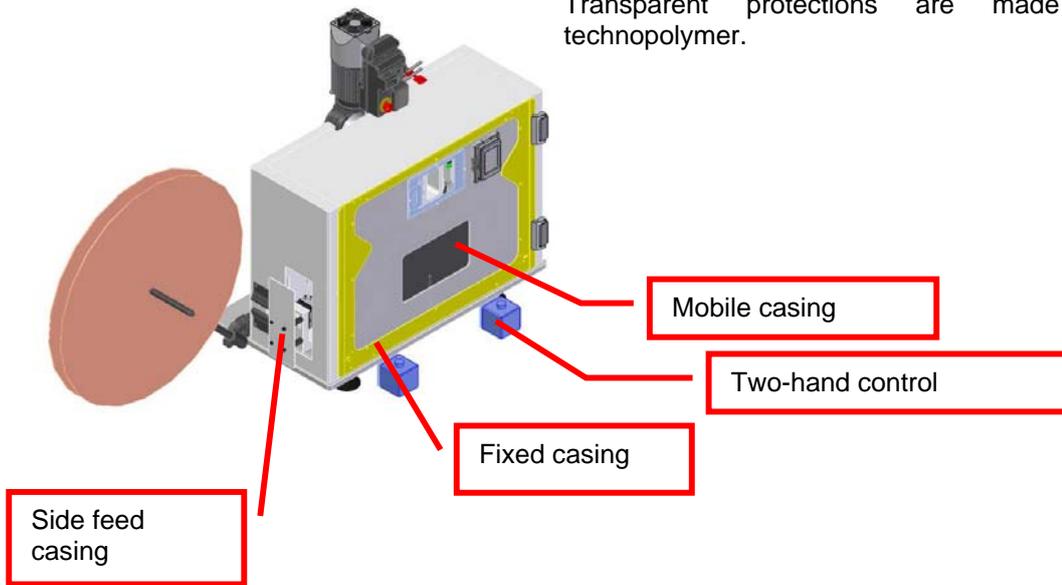
The distance of the casing from the tool must exceed 10 mm with a 6 mm wide slot as required by the standard (UNI – EN294). Verify this in the event that tools other than standard Mecal have been installed.

- Equipment is provided with safety protections which, if removed, prevent operation.
- Do not attempt to use equipment without safety protections.
- Modifying protection slots or guards aimed at protecting the operator from moving parts, preventing the insertion of fingers or hands, is prohibited. Do not tamper with or inhibit microswitches or safety sensors.
- Do not intervene or leave maintenance equipment (wrenches, grippers, etc.) on moving press parts when on.
- Do not remove warning labels: replace them when deteriorated.
- Leave a space of one metre around the perimeter of the machine to permit access to and maintenance of parts by the operators responsible.
- Equipment must be installed in an industrial environment where there is no risk of water jets. Do not direct jets or sprays on electrical equipment when cleaning.
- Equipment must only be used for the type of wire for which it has been designed.

2.6) Protections

End and side feed protective casing

Transparent protections are made in clear Lexan technopolymer.

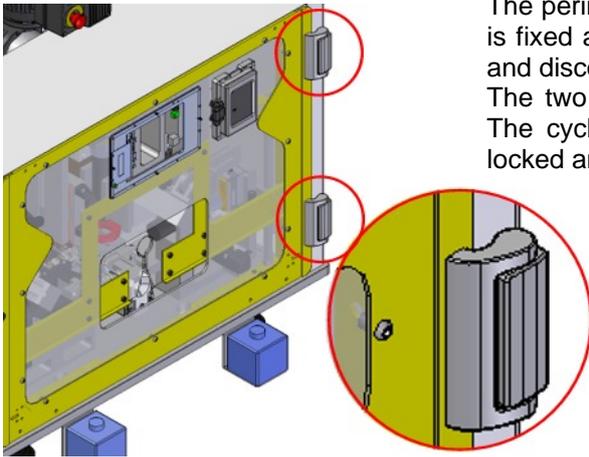


Fixed casing

The perimeter part of the central window of the end feed casing is fixed and can be opened only with the machine switched off and disconnected from the power mains.

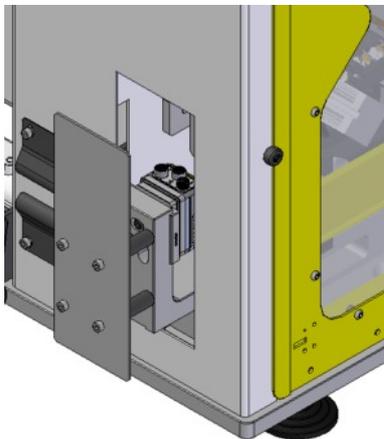
The two side hinges control correct closure of the work area.

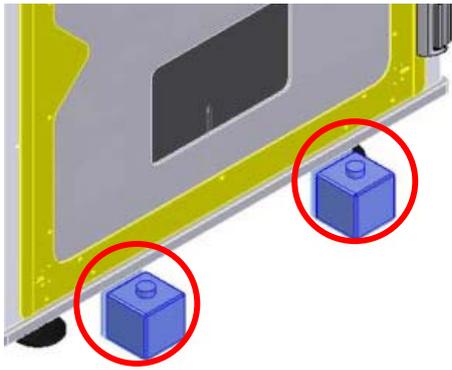
The cycle cannot be started up if the casing is not correctly locked and closed.



Side feed protective casing

Closure of the side casing portion, connected to the carriage for left vision system video camera movement, is guaranteed by a sensor which detects its correct position and by manual fastening.





Two-hand control

Machine and work cycle resetting are started by means of a two-hand control located in front of the machine.

3) Commissioning

This section describes all the operations and checks required to manage the machine during the period from delivery and implementation. Please carefully follow the instructions provided herein and contact Mecal with any doubts or uncertainty.

CAUTION: all installation operations must be carried out with the machine in emergency conditions, switched off and the air inlet closed.

3.1) Unpacking, lifting and transport



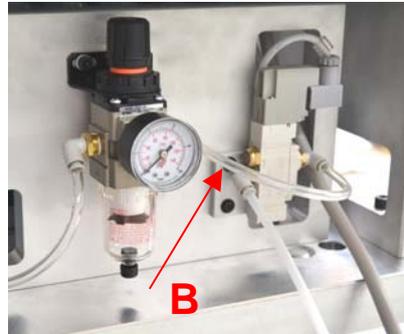
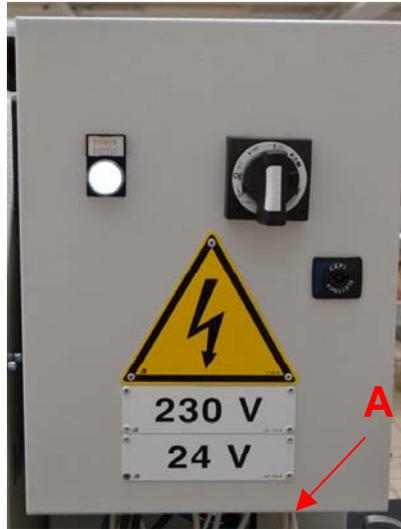
- Use proper equipment to handle packaging.
- Verify by checking the accompanying document that the equipment has not been damaged and that there are no missing parts.
- If any anomalies are detected, inform Mecal no later than 10 days from the date of receipt.
- The crimping station can be lifted and moved in the work position using the base plate as a surface for the forklift. When the machine is removed from packaging for the first time, it is necessary to attach the 6 anti-vibration feet that were removed to prevent damage during transport under the base plate.
- Packaging must be disposed of as per regulations in force.
- Make sure that the support surface is suitable for the weight of the equipment and that it is firmly secured in place.
- Do not dispose of packing in the environment: contact authorised companies for disposal.



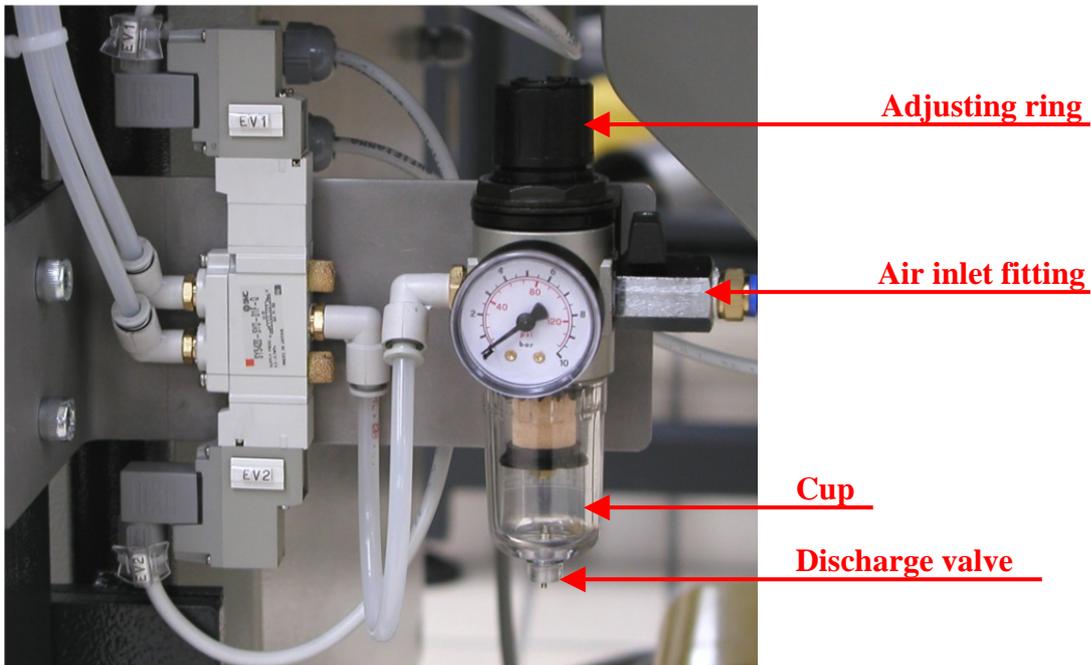
3.2) Pneumatic connection

The main electrical and pneumatic connections are on the rear of the machine.

- Connect the network **A** power cable, which comes out directly from the electrical panel, to a normal outlet.
- Connect a Ø6mm air hose to pneumatic fitting **B**.



Connect the pneumatic supply to the corresponding fitting (diameter 6 mm, quick coupling for Rilsan tubes). Make sure that the output pressure from the filter/regulator unit is 6 bar (pressure gauge is calibrated Mpa 6 bar = 0.6 MPa). If output pressure from the unit needs to be adjusted, use the pressure adjusting ring: activate it in the clockwise direction to increase pressure or in the counter-clockwise direction to decrease it. Below is an image of the air regulation/filter unit. Periodically check the condensate cup, empty periodically as needed by pressing on the corresponding valve.



3.2.1) Pneumatic and electric applicator connection

CAUTION: To avoid collisions, make sure there are no mechanical obstructions on all moving systems before connecting all the pneumatic components.



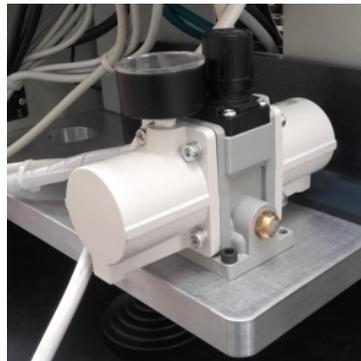
Connect the flying electric connector located on the machine with the panel connector positioned on the mini-applicator. Make sure that the locking ring is inserted and tightened.



Connect the flying pneumatic connectors, located on the mini-applicator, with the panel on the back of equipment. Make sure that the locking rings are inserted and tightened.

Standard pressure: 5-7 bar

CAUTION: all connector connecting operations should be carried out with the press in emergency conditions, switched off and without air in the system.



Equipment pressure is increased by the buster by approximately 6 bar to 9 bar for the squashing phase and for holding the table position.

Buster position: 8-9 bar

3.4) Electrical diagram

WIRING DIAGRAM

BD010 90°

CLIENT : YAZAKI

MECAL S.r.l.

DRAW BD010

SERIAL NR. ATT0155

DATE 20/03/2017

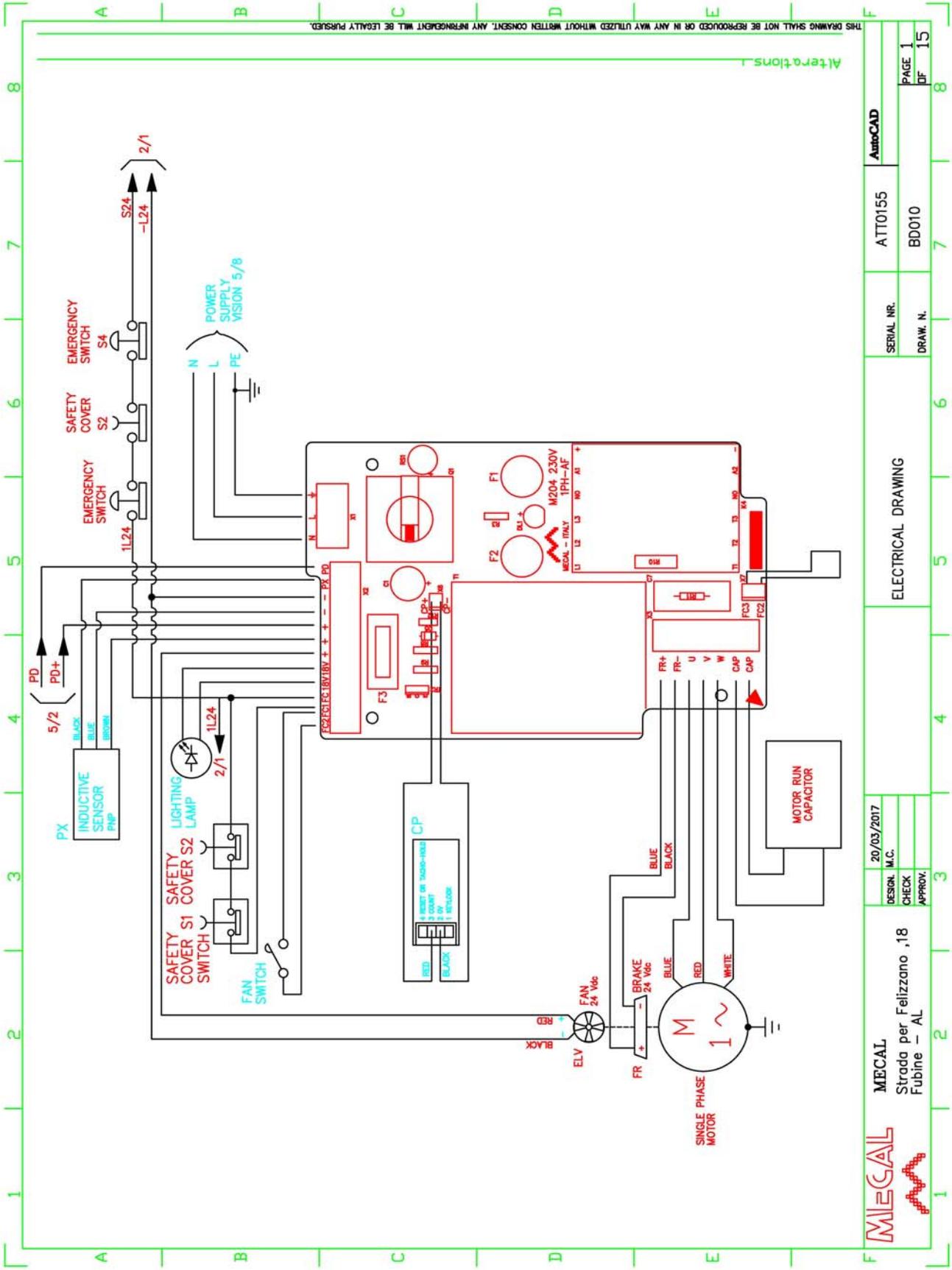
MCB120 PROGRAM A1 : MCP120AXR00

MCB120 PROGRAM A2 : MCP120AZR00

MCB120 PROGRAM A3 : MCP120AZR00

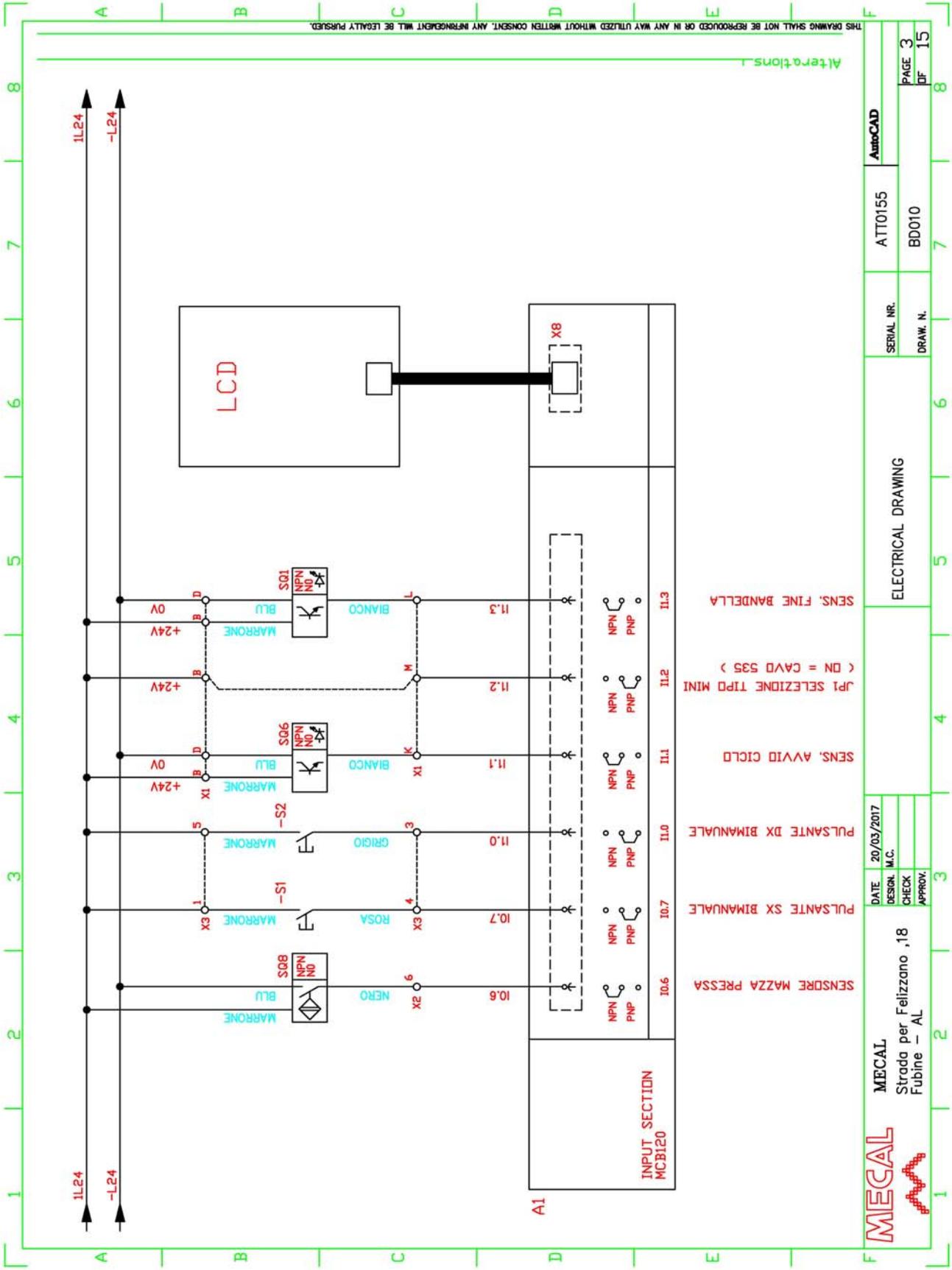
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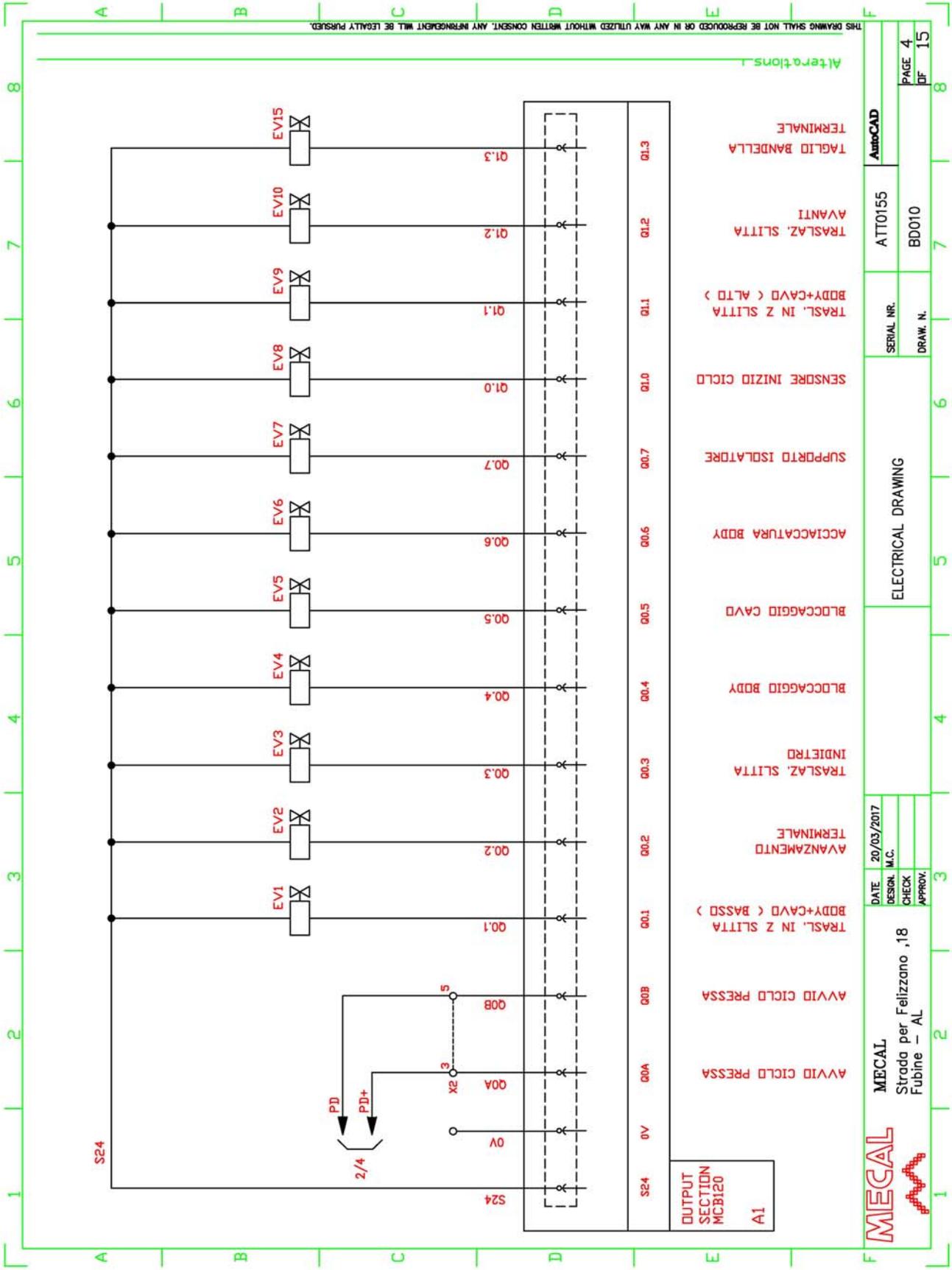
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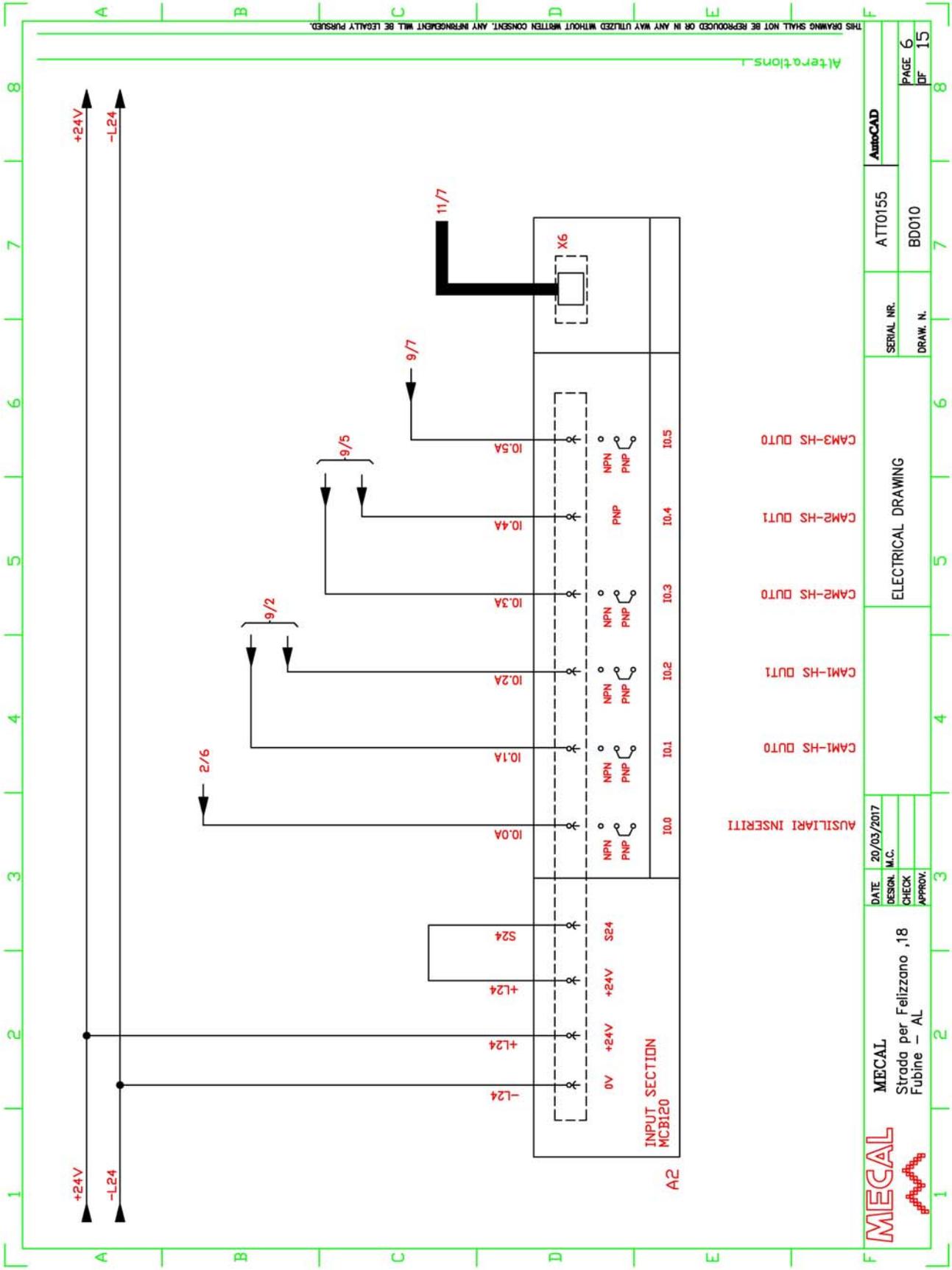
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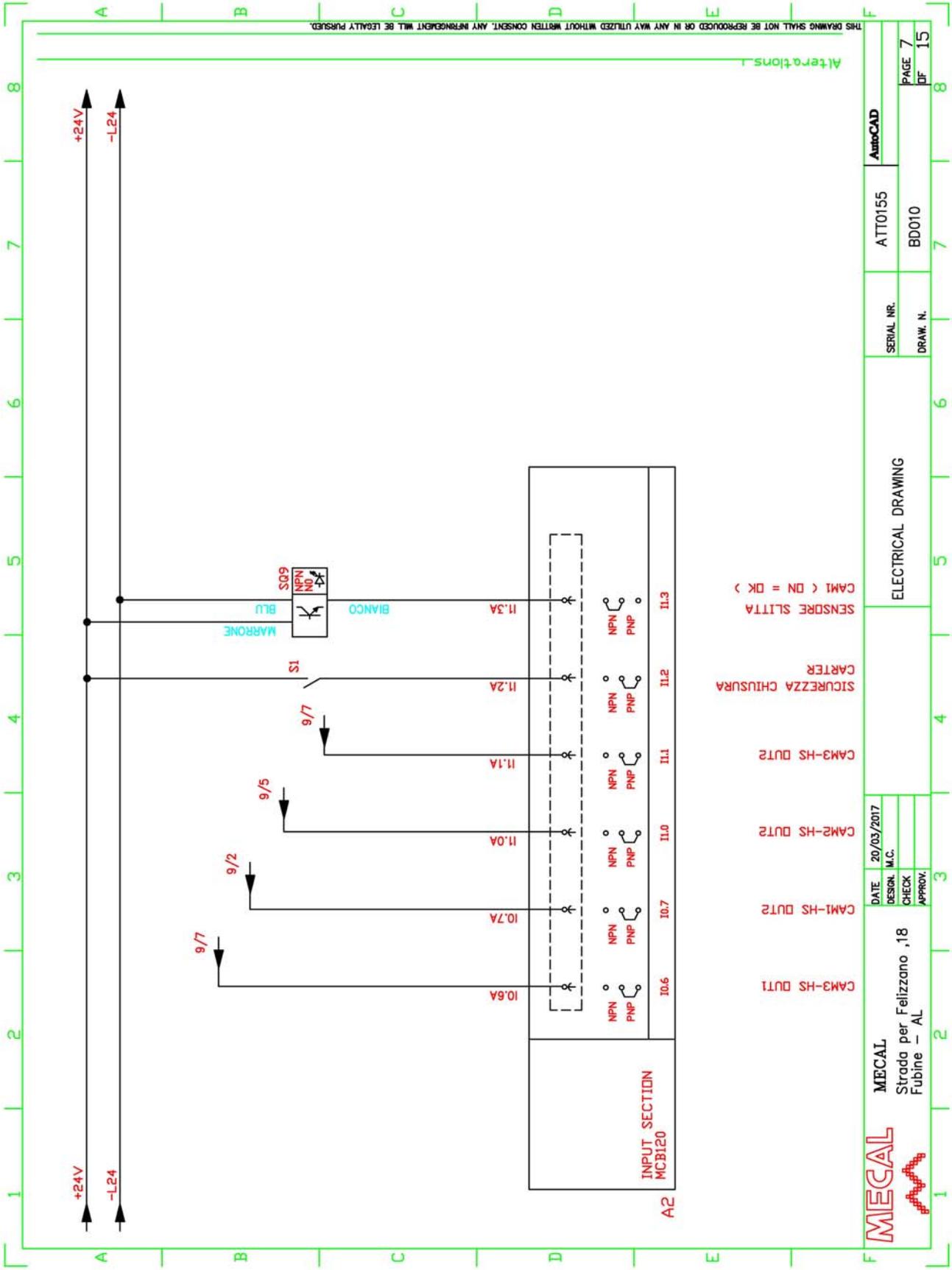
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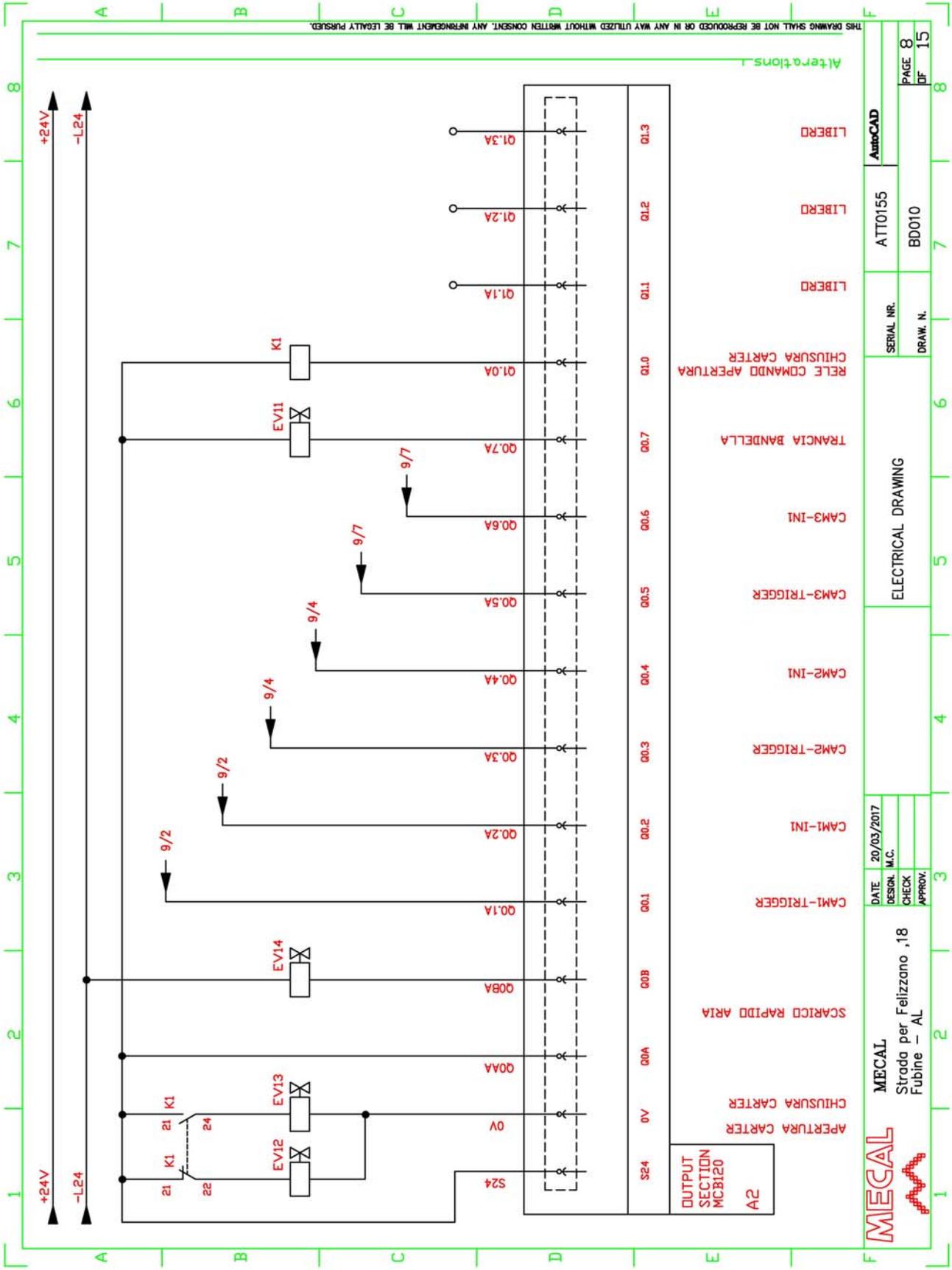
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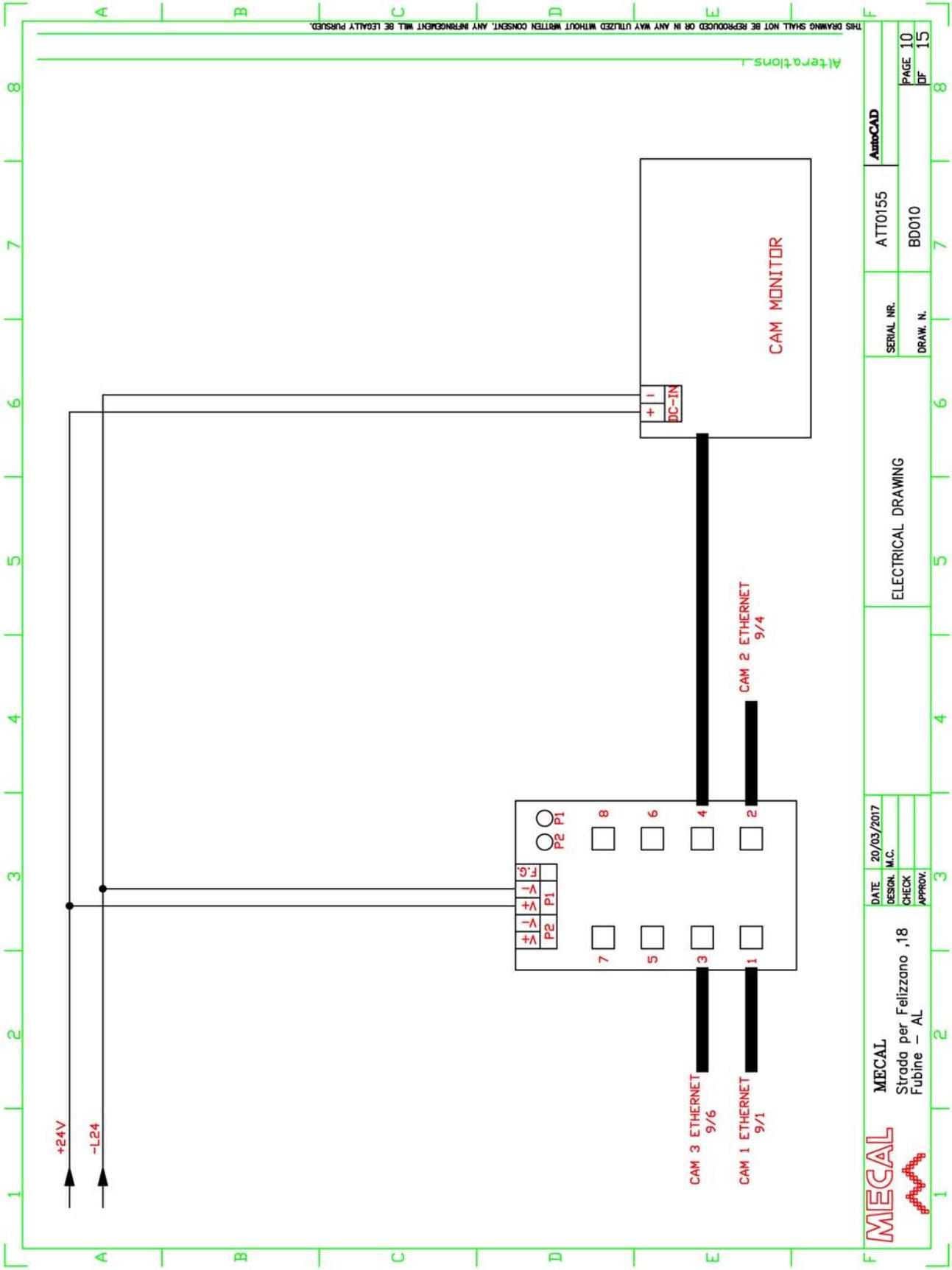
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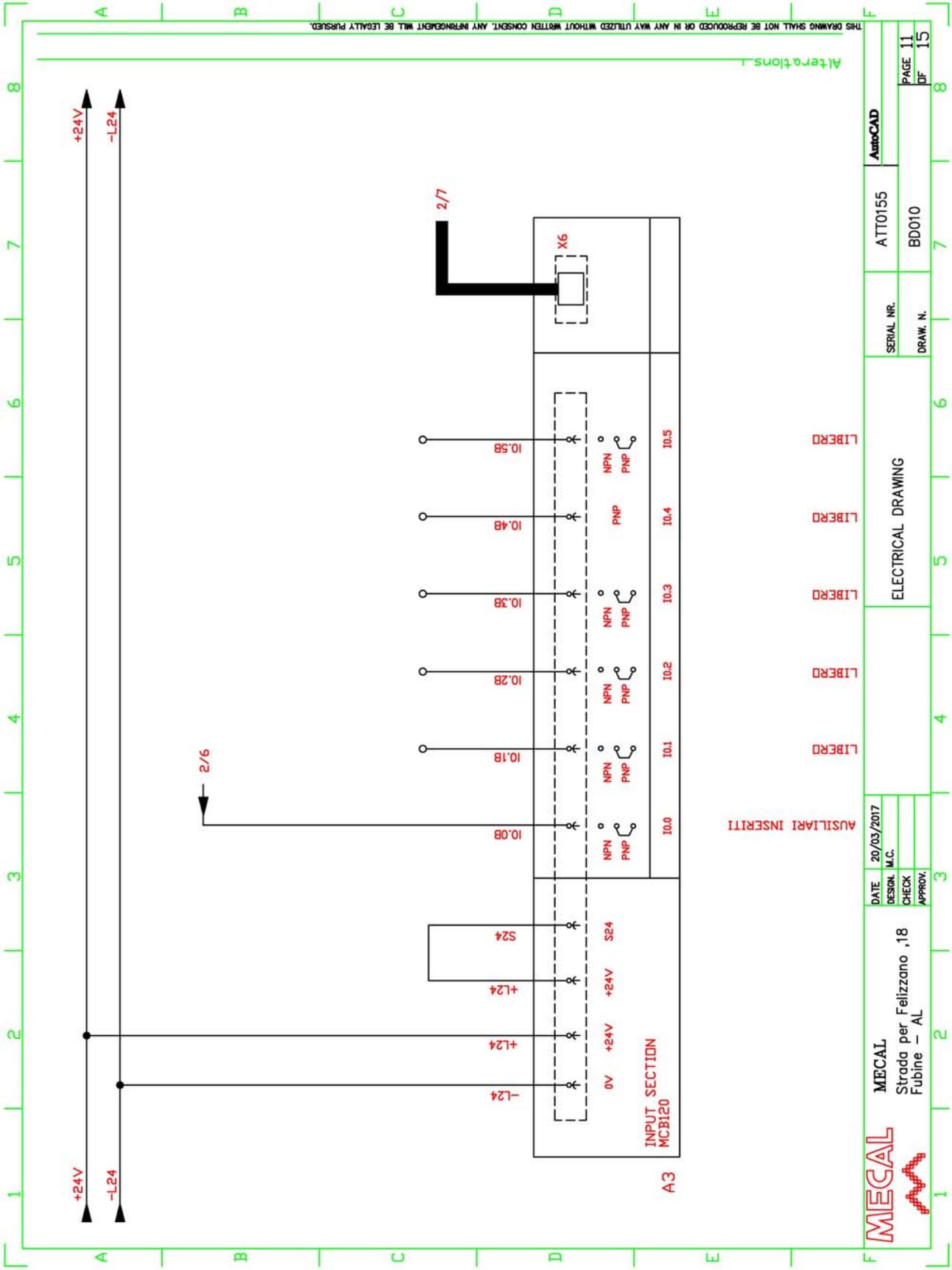


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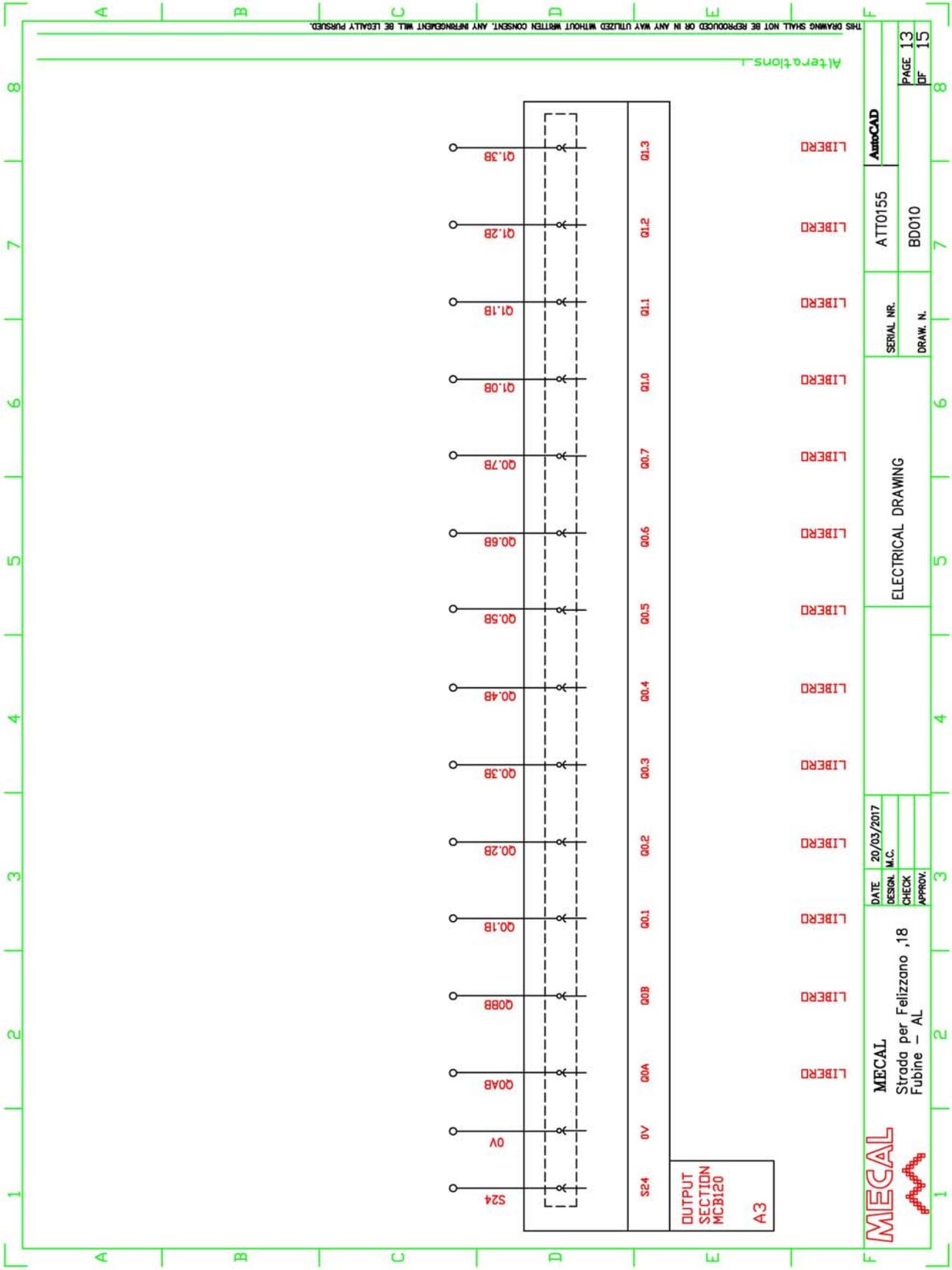
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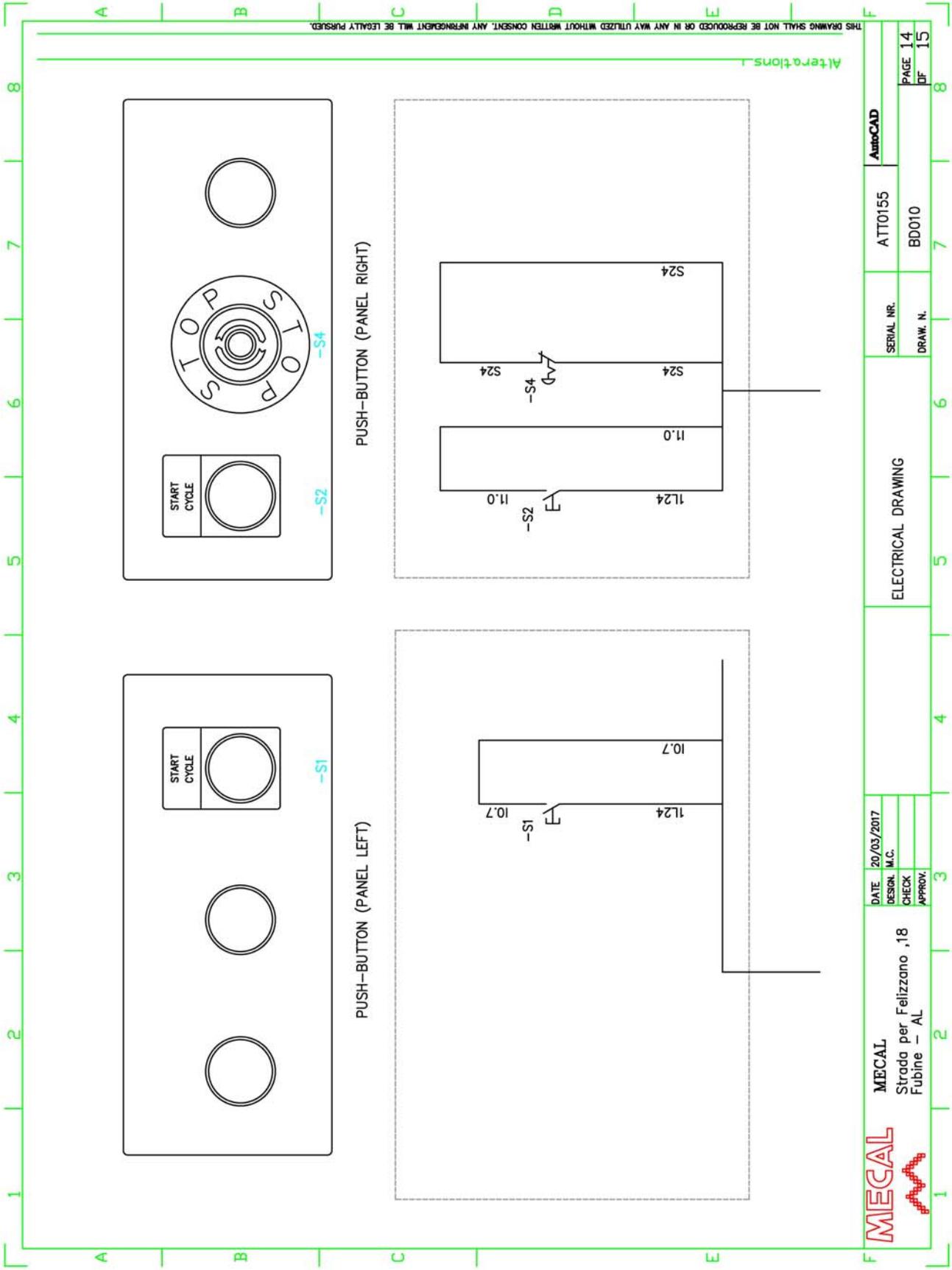
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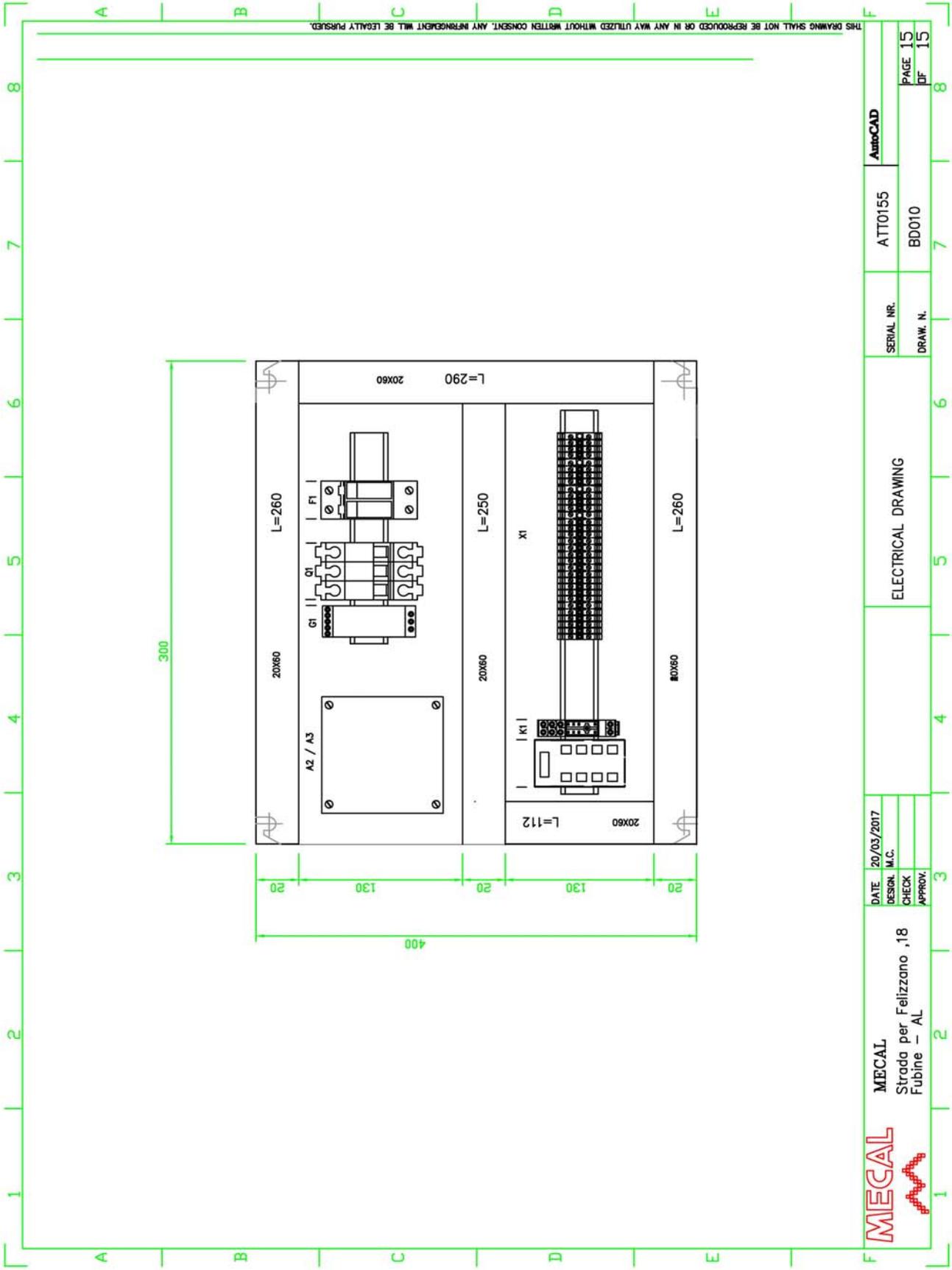
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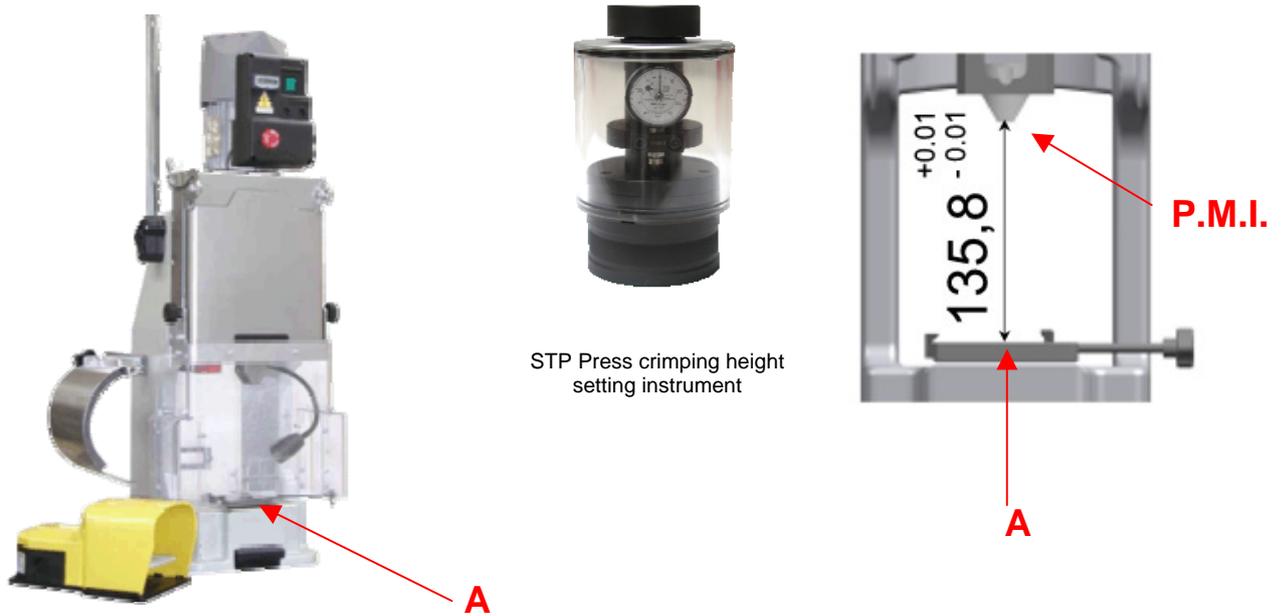
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3.5) Press crimping height setting



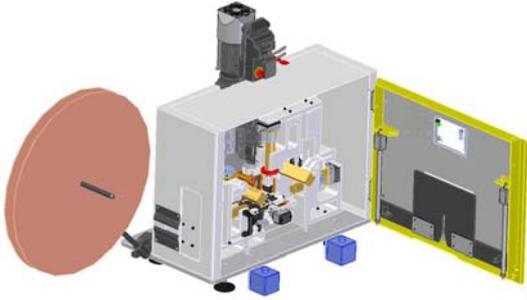
Press crimping height setting is very important for correct operation. Clean the baseplate surfaces “A”, guaranteeing a good support surface between the base of the press and that of the mini-applicator. Use the corresponding STP Crimping height instrument to verify the correct working height which must be BDC 135.8mm (± 0.01 mm).

Note: MECAL supplies machines pre-tested and calibrated. Check the supplied P107 instruction manual.

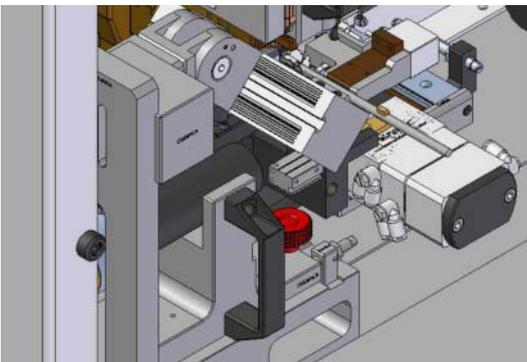
3.6) Magnum mini-applicator installation

CAUTION: before installing the mini-applicator, make sure the mini-applicator is properly adjusted and that the equipment is set up as follows.

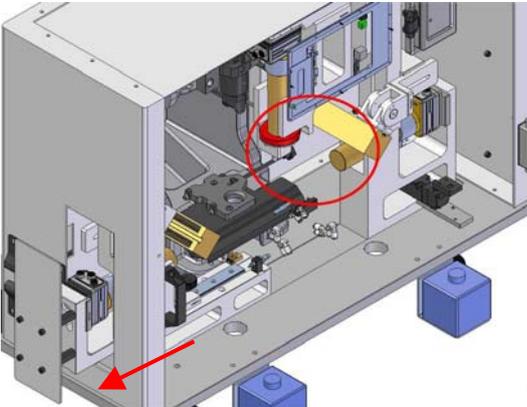
3.6.1) Arrangement of equipment for applicator installation/uninstallation



Open the fixed casing by unscrewing the bush with a size 5 hex wrench.



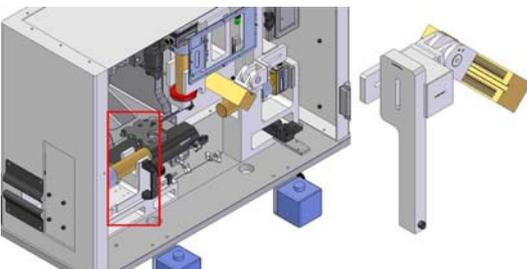
Unscrew the knob and move the video camera unit.



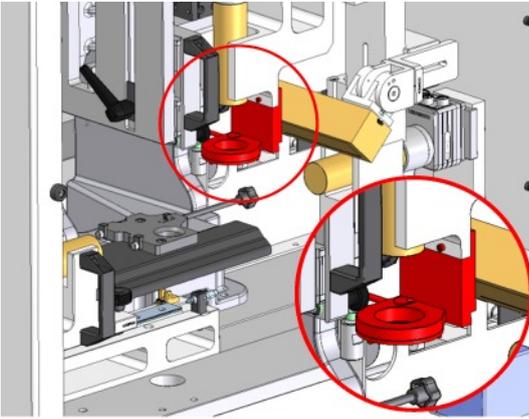
Move the left video camera carriage, freeing the magnum insertion area.

Caution: do not bump into the video cameras during mini-applicator installation and uninstallation.

CAUTION

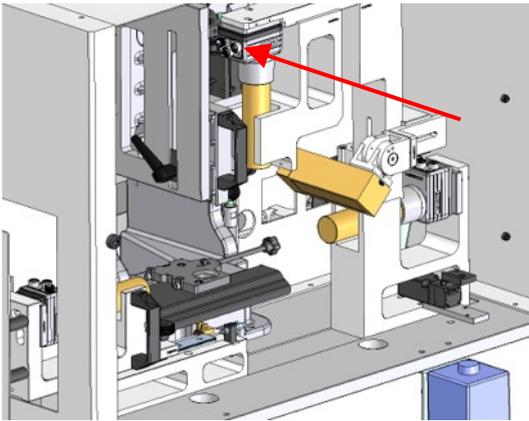


Remove the left illuminator, unscrewing the fixing screw. Place the illuminator in a safe and stable place.

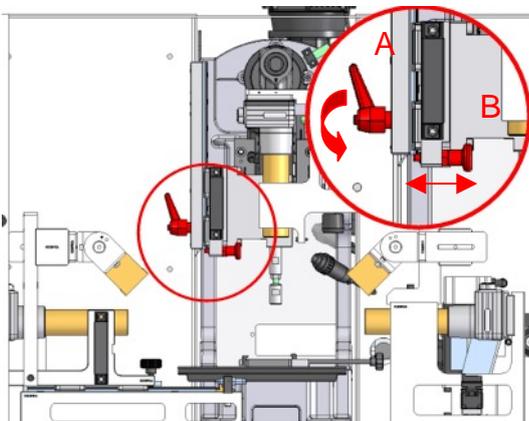


Remove the top illuminator and relative support, unscrewing the fixing screw.
Place the illuminator in a safe and stable place.

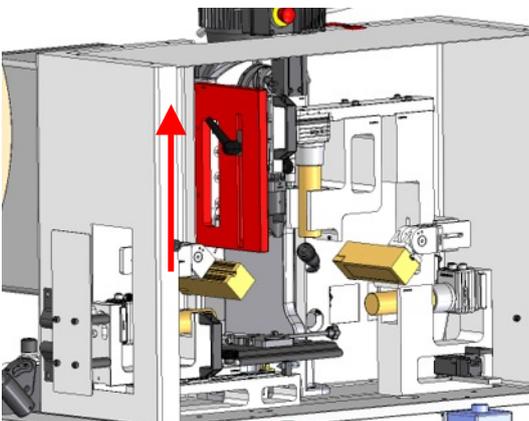
Note: do not remove the illuminator from its support as it could damage camera centring.
Place the illuminator in a safe and stable place.



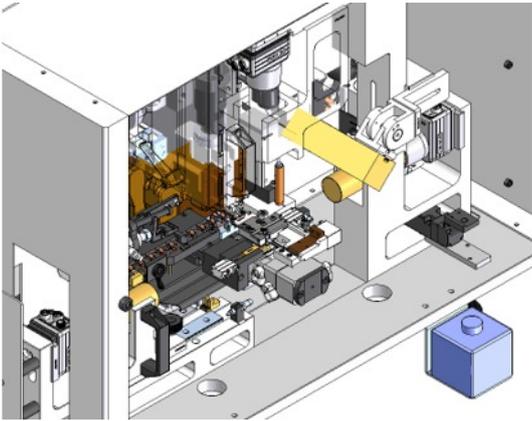
Unscrew the top video camera connections.



Loosen knob "A" and release stop "B".

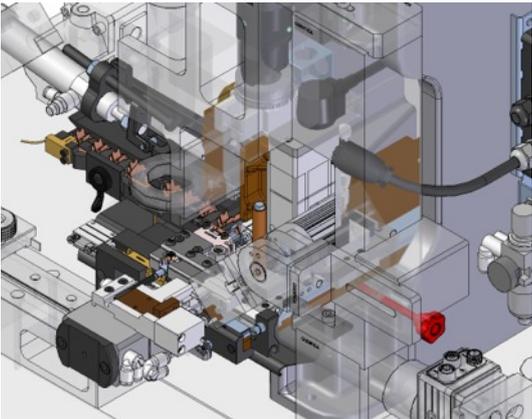


Move the manipulator upward.



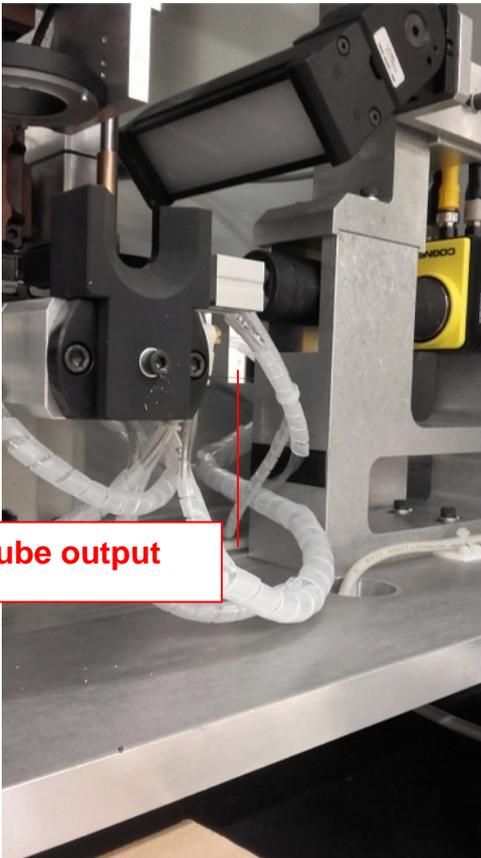
Reset the magnum adjusting ring and insert it in the "T" shank on the press.

Note: Do not bump into the cameras.

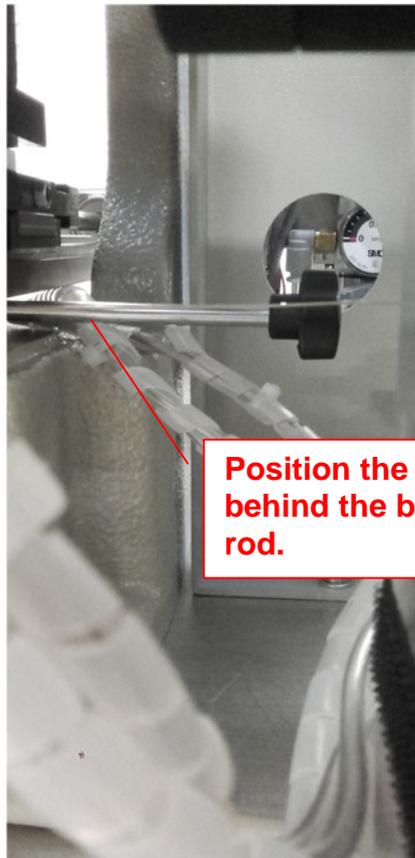


Fasten the base of the applicator to the base of the press, screwing the rod into the base. Connect the pneumatic and electrical connections as described in Chapt. 3.2, insert the terminal as described in Chapt. 3.6 and adjust the magnum adjusting ring with the values contained on the plate Chapt. 5.3. Reset the machine, assembling the previously disassembled parts. (assemble the left illuminator and move the carriage to the right, install the top illuminator support and lower the manipulator)

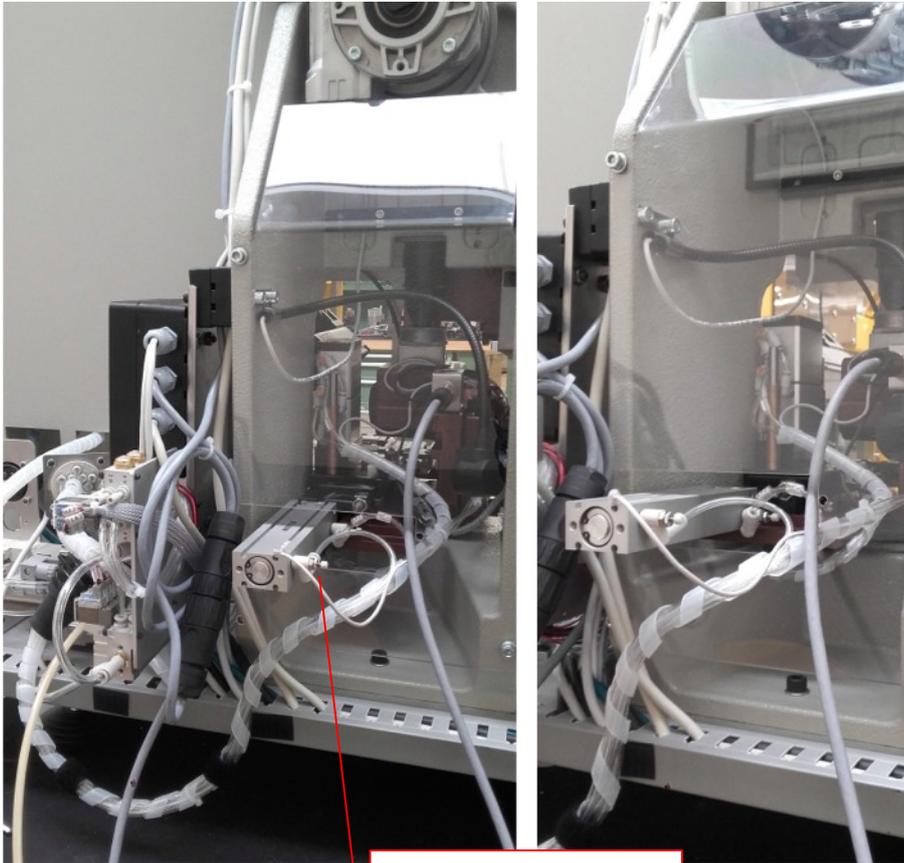
Position the pneumatic system tubes as shown in the figure. Make sure that no tubes are crushed, preventing air flow.



Air tube output



Position the tubes behind the base fixing rod.



Air tube output

Uninstall the magnum according to the same previously described procedure.

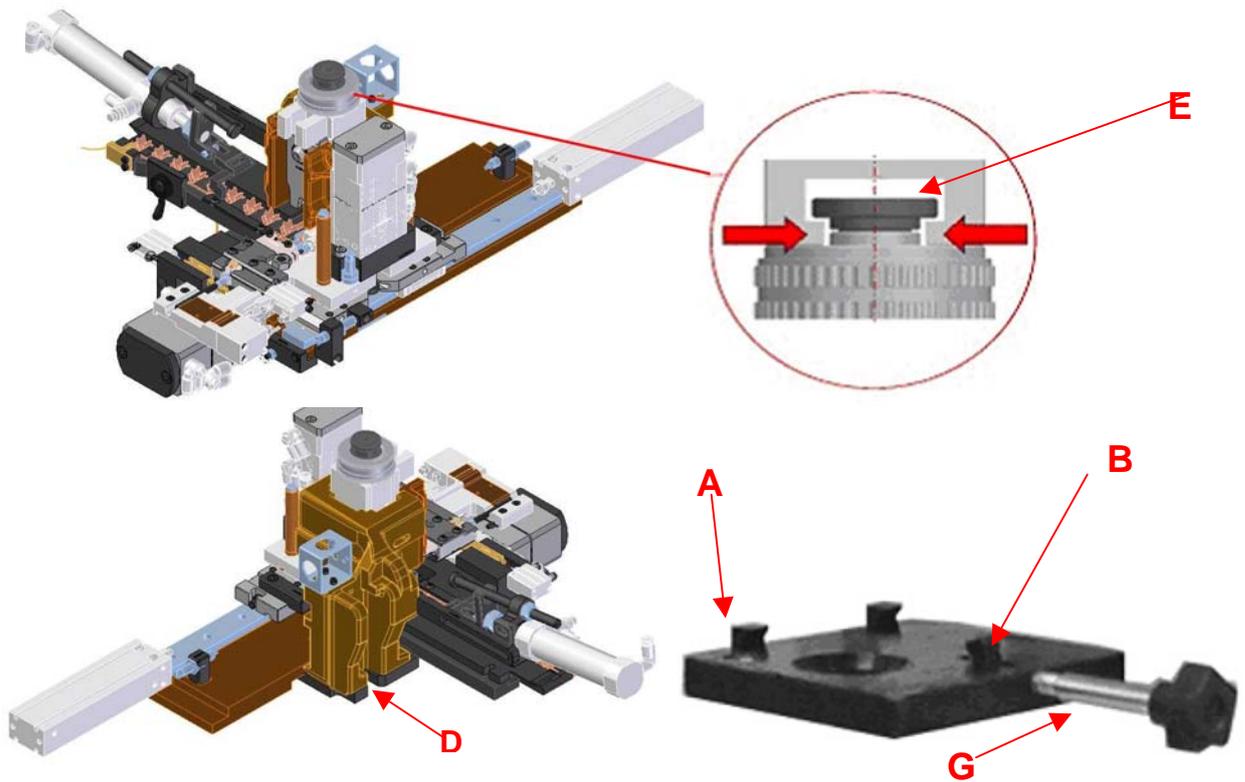
- Before removing the magnum, be careful to verify that you have removed the terminal, adjusted the ring on the zero value and disconnected the pneumatic and electrical system.
- Do not bump into the video cameras and illuminators.
- Place the illuminator in a safe and stable place.

3.6.2) Magnum applicator settings

Before installing the applicator on the press, it is important to verify that the applicator has been correctly adjusted. (see Chapt.5.1, 5.2 and 5.3)

3.6.3) Applicator fastening

- The Magnum applicator is packaged with a rubber protection set between the wire crimper and the anvil to prevent damage of said parts. Remove the protection upon installation.
- Position the tool at the fixing base **A** of the press, align the base **D** of the Magnum with the pawl **B** and screw in the tightening knob **C**.
- Make sure that closing occurs in the correct manner, checking that the tool perfectly adheres to the fixing base **A**.
- The pin **E** on the applicator must be centred with the "T" shank on the press.

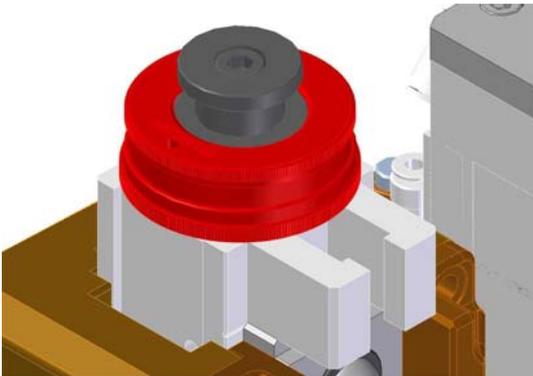


3.7) Terminal insertion

Make sure that the terminal strips are positioned correctly and slide without obstructions before being inserted in the mini-applicator.



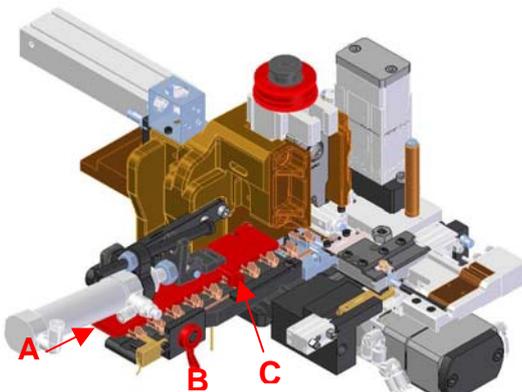
Insert the strip inside the machine casing, having it pass from the slot on the left side of the equipment.



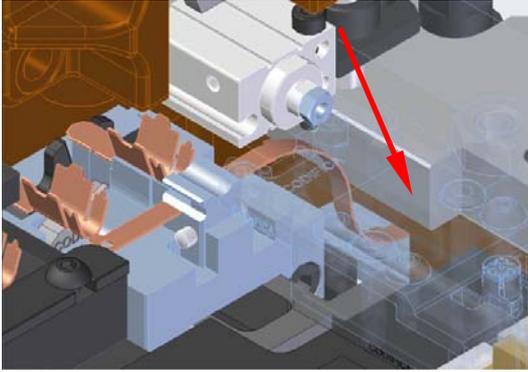
Adjust the mini-applicator ring in the position corresponding to the **larger** section.



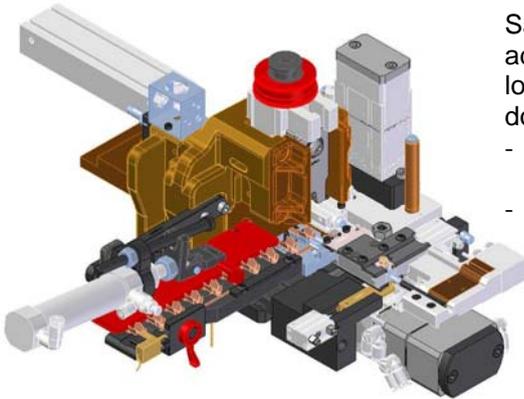
Before inserting the terminal strip in the mini-applicator, cut the first 4 or 5 terminals as shown in the figure.



Insert the terminal to be crimped in the guide **A** after having freed the clutch by means of the eccentric part **B**. Push the strip terminal until it engages with the pawl **C** and close the clutch.



Channel the strip inside the conveyor. Push the terminals in, positioning the terminal in the position previous to that of work. Tighten the clutch **B**.



Sample the section of the wire to be used, having arranged the adjusting ring "Copper **D**" as indicated by the values on the plate located on the applicator body. If the detected crimping height does not correspond with said references, check:

- Press crimping height setting at BDC 135.8mm, see paragraph 1.1. (important warnings) and 3.5 (Installation).
- Adjust the ring (only if deviation is a few centimetres).

CAUTION:

It is advisable to perform a complete step by step press cycle and check that:

- 1) There are no mechanical impediments in sliding parts

The terminal must be correctly positioned, aligned with the crimping and cutting parts. If this does not occur, check the next paragraphs 5.2 (pitch adjustment) and 5.1 (terminal adjustment).

If any mechanical impediments are encountered during the manual cycle, check:

- 1) Correct locking of applicator on the press, paragraph 3.5 (Magnum installation)
- 2) Correct setting of the press at BDC 135.8mm, see paragraph 1.1. (important warnings) and 3.5 (Installation).
- 3) Check that the position of the rings is not fully open/closed (see 5.2).

If the terminal is not correctly positioned:

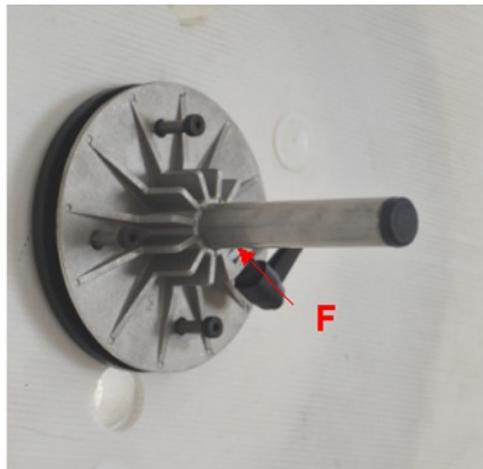
- 1) Verify that the pawl is in the correct engaged position (holes on strips for side feeds, copper/resin fins for end feeds or other, see 5.2).

Verify that the clutch eccentric or lever is in working position (see 5.2).

3.8) Reel insertion



Remove the fixing flange and replace the reel.



Re-insert the flange, slightly press down, pushing the flange toward the reel. Secure the position, tightening the locking handle **F**.

4) Start-up and use

Pay due attention when manoeuvring for equipment installation/removal and crimping height setting so as not to damage any part of the machine.

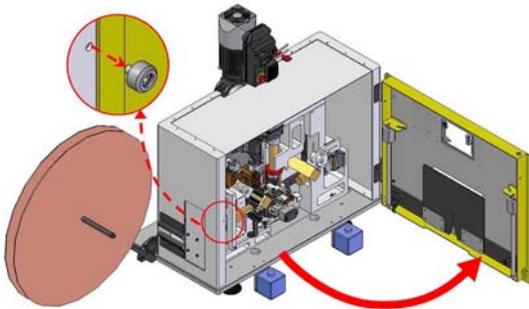


- Check that the material to be processed is loaded and close the front door.
- Check that the line switch (A) located on the equipment electrical box is on and set to number "1".
- Check that the switch (C) set near the two-hand control is disconnected.
- Make sure that the emergency switch (B) is disconnected.
- Check pneumatic power (5-7 Bar).
- Wait for pneumatic circuit loading.
- Activate the two-hand control to start the cycle.
- To start the cycle, read chapter 8.

4.1) Stop and reset



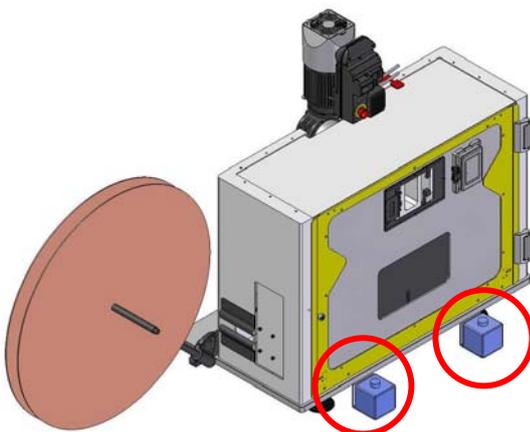
If you need to stop the machine at any time during the cycle, press one of the two emergency buttons.
The emergency button cuts off power to equipment and discharges the pneumatic system.



Open the casing by unscrewing the locking bush and remove the components that caused jamming.



To restore the emergency, release the button, turning it in the clockwise direction until you hear a release "click."



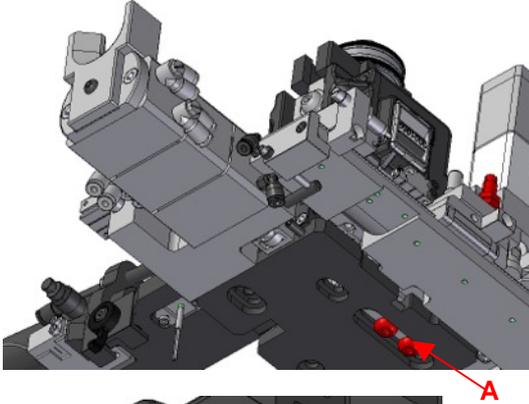
Close the fixed casing back up and activate the two-hand control for reset.

5) Production adjustments

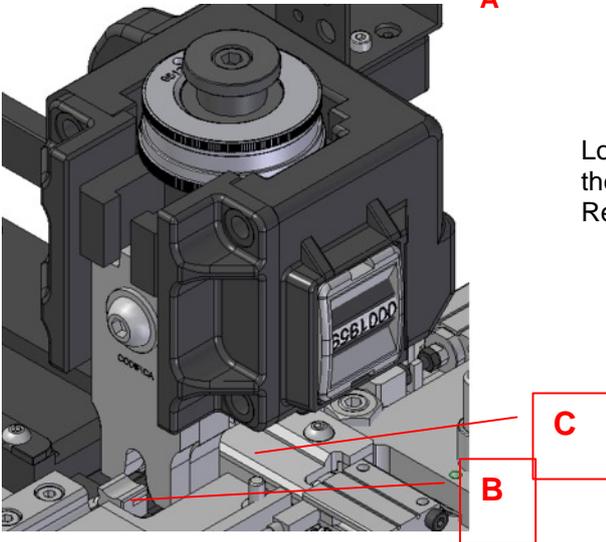
CAUTION: all installation operations must be carried out with the machine in emergency conditions, switched off and the air inlet closed.

5.1) Crimper alignment

5.1.1) Alignment of anvils with knives

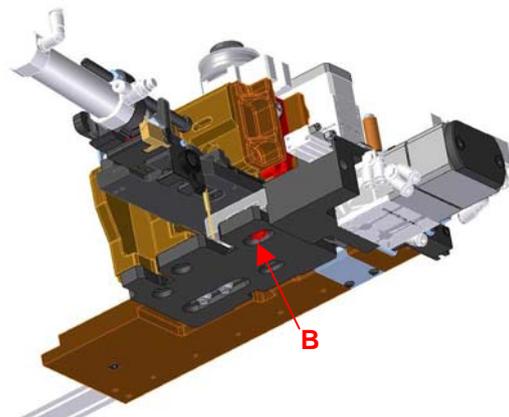
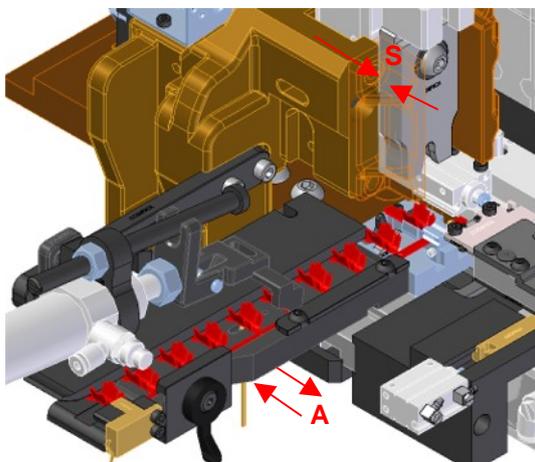


Unscrew screws "A".



Lower the top crimping unit, having it slide freely between the cutting blade "B" and the rear support "C".
Re-tighten the screws "A".

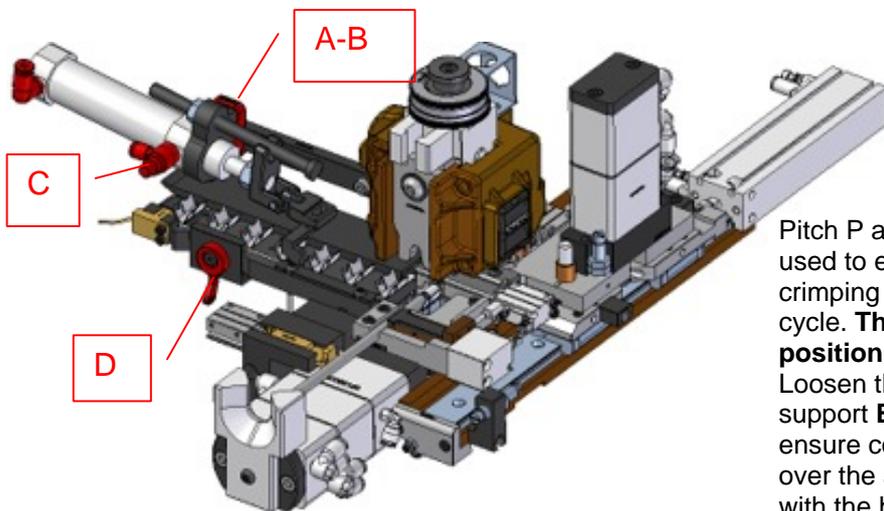
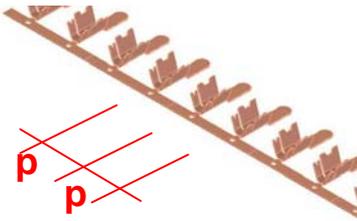
5.1.2) Terminal alignment with crimper



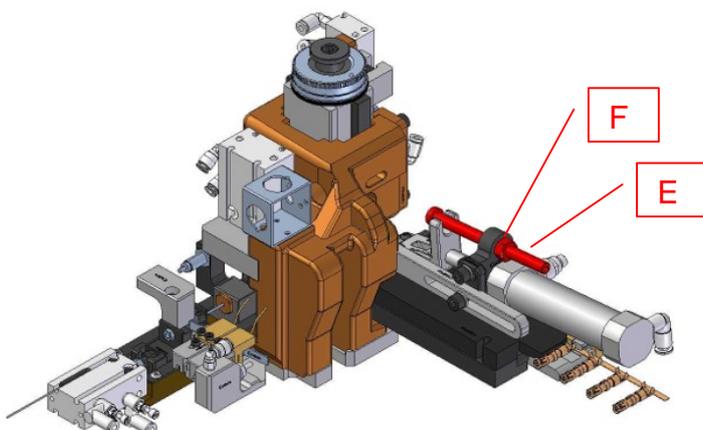
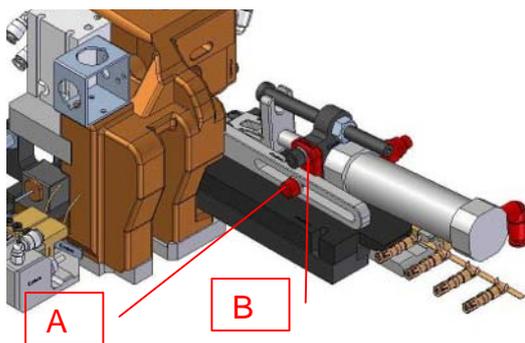
Terminal alignment with the wire crimper **S** (copper) occurs by moving the terminal feeding slide **A**. Loosen the locking screws **B** at the bottom before performing the operation.

5.2) Terminal pitch adjustment

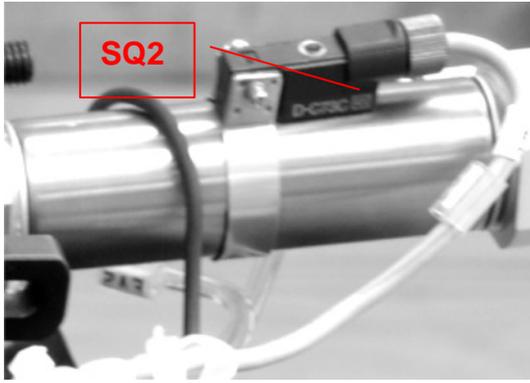
Pitch p is the distance between one terminal and the next.



Pitch P adjustment on the Magnum applicator is used to engage the terminal and move it to crimping position during each complete operating cycle. **The terminal must be set in the crimping position with clutch D in the operating phase.** Loosen the locking screw **A** and move the support **B** until adjustment has been made. To ensure correct adjustment, move the pawl slightly over the anchoring point (normally corresponds with the hole or slot present on the strip). Tighten the locking screw **A**. The feeding speed can be defined by means of the air flow regulator **C**.

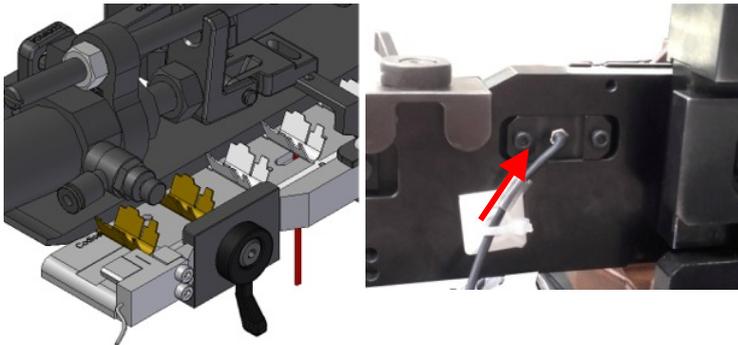


The terminal arrival position is defined by the cylinder stroke. Loosen the lock nut **F** and regulate the adjustment screw **E**. Once the correct position has been found, re-tighten the lock nut **F**. Repeat the operation until the desired adjustment has been set.



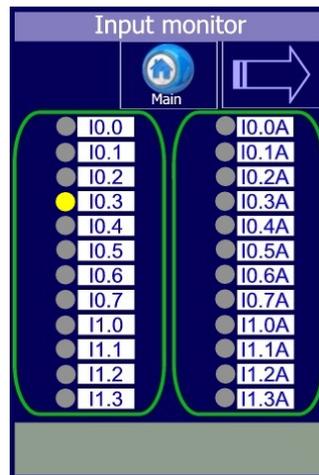
Once the pitch has been adjusted, proceed with the sensor with detects cylinder position. Move the sensor toward the anvil and search the cylinder arrival position, returning toward the outside with the sensor. Fasten the sensor and test it, activating solenoid valve EV2 a couple of times to verify correct adjustment.

5.2.1) Terminal presence sensor adjustment



The terminal position is detected by the optical fibres set under the slide. Adjust the optical fibre by unscrewing the fibre support screws and moving the block until you have reached the position aligned with the terminal.

If a terminal is missing from the reel, the sensor communicates this absence to the control unit, which proceeds to perform a further pitch. The control unit generates an error after the absence of five consecutive terminals.



Use the sensor screen to verify that the fibre has been switched.

CAUTION: if the emergency control is activated after fibre reading, data detected by the fibre itself will be cancelled. Therefore, verify that there are no missing terminals between the fibre and the anvil before re-starting.

5.3) Regulating the adjusting ring

The wire cross-sections to be used (mm² or AWG), the values for copper adjusting ring position (INDEX) and the crimping height values (CHR expressed in mm) are contained on the applicator plate.

MECAL www.mecal.net	TER.	G8H 25937	
	MOD.	LMP2409-JA	
	MM ²	INDEX	CHR
	16.00	2.04	5.45
	10.00	2.46	5.05



Adjusting the crimping height on the conductor (adjusting ring type A)

To correctly set the adjusting ring and obtain crimping values declared on the Technical Data Sheet and on the plate, proceed as indicated in the following example:

Application example: Sect. 10.00 mm² INDEX=2.46 CHR=5.05

The adjusting rings have a maximum range of 2.7 mm, therefore we find labelling from 0 to 27 with a resolution of 0.01 mm for each click on each outer circular crown. To set the value INDEX=2.46, rotate the adjusting ring A until reaching the engraved number nearest to the one needed, moving it closer to the operating field, in this specific example the value is 24. Keeping in mind that each click equals 0.01mm, you will need to increase by 6 clicks to obtain 2.46 as indicated on the plate. The INDEX value is indicative as it is based on the type of press used and on the different bending due to the work load, therefore values may slightly deviate from those indicated. Further adjustment on adjusting ring A may be necessary to obtain the final result of the operating height CHR=5.05mm.

Adjusting the insulating crimping height (adjusting ring type B)

The applicator plate does not contain any insulating crimping data. If the customer supplies crimping parameters, they will be indicated on the Technical Data Sheet. The achievement of required values is guaranteed by means of the adjusting ring **B**, with an adjustment process that is the same as the one described prior for adjusting ring **A**. If no crimping specifications have been supplied, Mecal suggests setting the adjusting ring **B** to position 0 and increasing its value until the desired result is achieved.

Reference index C

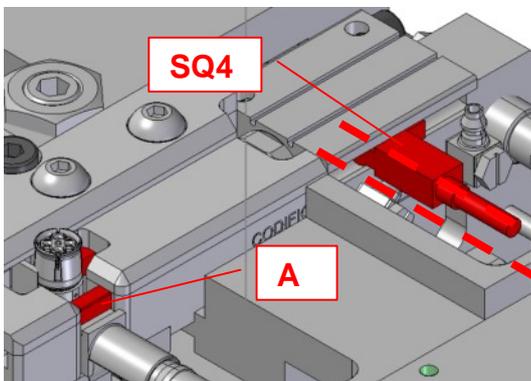
The reference index for both adjusting rings is represented by a line on the mark **C**.

The data declared on the Technical Data Sheet has been collected using a Mecal P107 press set at a height of 135.8mm (Bottom Dead Centre).

5.4) SQ4 body presence adjustment

The SQ4 sensor detects the correct positioning of the body on the insulator, while the video cameras detect the presence of the insulator body.

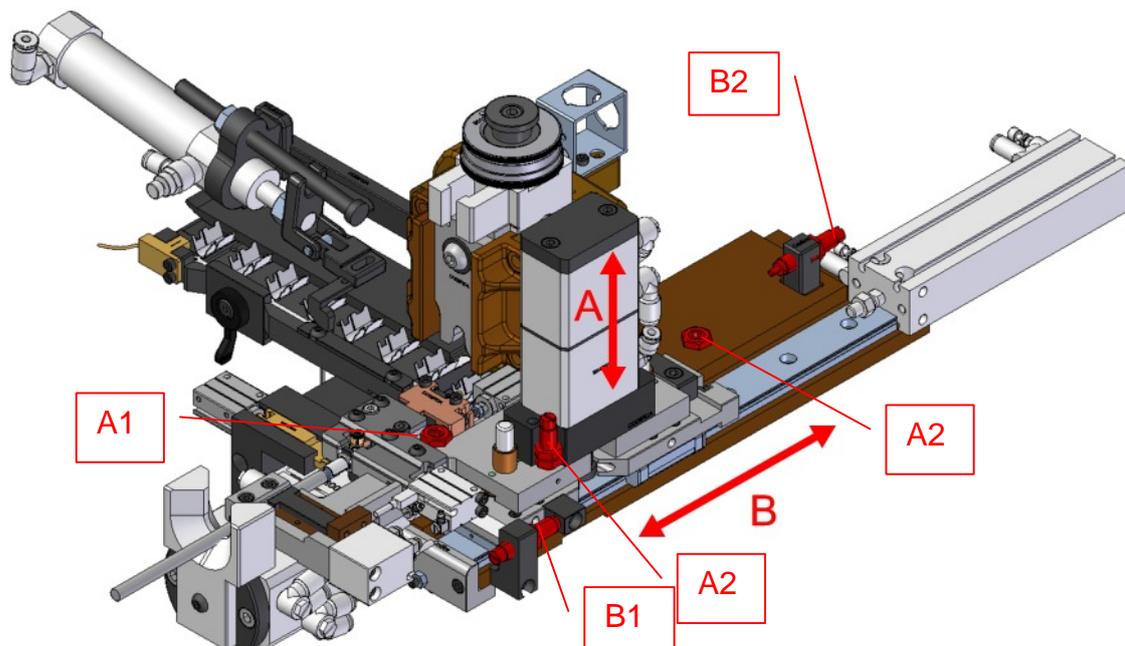
If the body is not correctly inserted, the shutter may not stop its stroke and the SQ4 sensor would generate an error signal on the display.



SQ4 sensor adjustment is carried out in the following steps:

- Activate solenoid valve EV4 and bring the cylinder to the travel limit,
- loosen the sensor fixing screw and move it toward position "2",
- slowly move the sensor toward position "1" until the LED switches on.
- Lock sensor SQ4 using the corresponding screw.
- Perform a work cycle to make sure it has been correctly adjusted.

5.5) Crimping table adjustment



The crimping process is managed with two movements: "A" and "B".

5.5.1) Insulator loading table adjustment (A1)

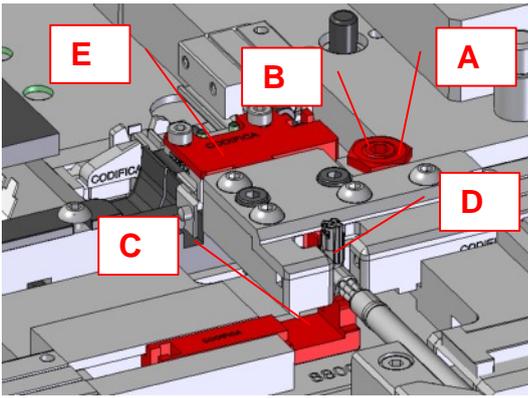


Table tool adjustment enables correct insertion of the insulator "D" in the centring device "E" and the support "C".

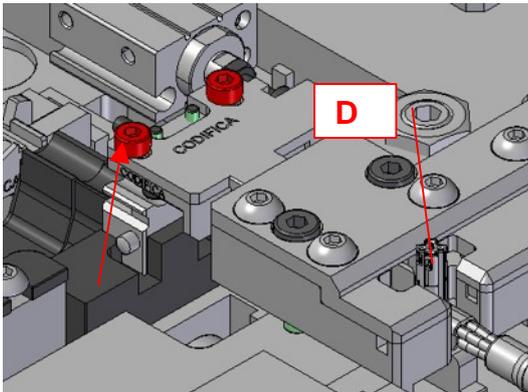
Loosen lock nut "A".

Turn the adjustment dowl "B", lowering the table, reducing the clearance between the support "C" and the centring device "E", preventing insulator "D" insertion.

Keeping the insulator "D" pushed, turn the adjustment dowl "B", gradually increasing the clearance between "C" and "E". Once free sliding of "D" between "C" and "E" has been detected, tighten the lock nut "A".

Adjust with the pneumatic system active.

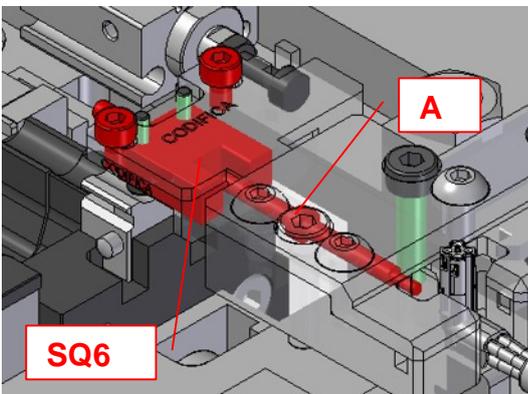
5.5.2) SQ6 insulator sensor adjustment



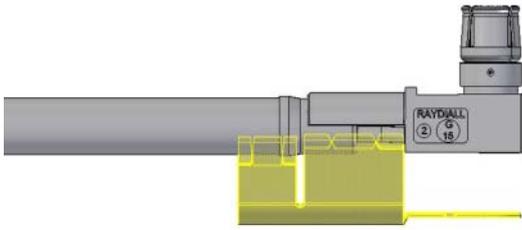
Sensor SQ6 detects the correct position of insulator "D". The reference needle (A) inside the support interrupts the beam made by the sensor if in the correct position.

Sensor adjustment is carried out in the following steps:

- Loosen screws.
- Move the support toward the back part of equipment.
- Move toward and keep the insulator at the mechanical travel limit using the centring device.
- Move the sensor support toward the insulator until the beam interruption is intercepted.
- Re-tighten the screws.
- Make use of the sensor vision panel for correct adjustment.
- Check correct operation a couple of times, activating solenoid valve EV8.

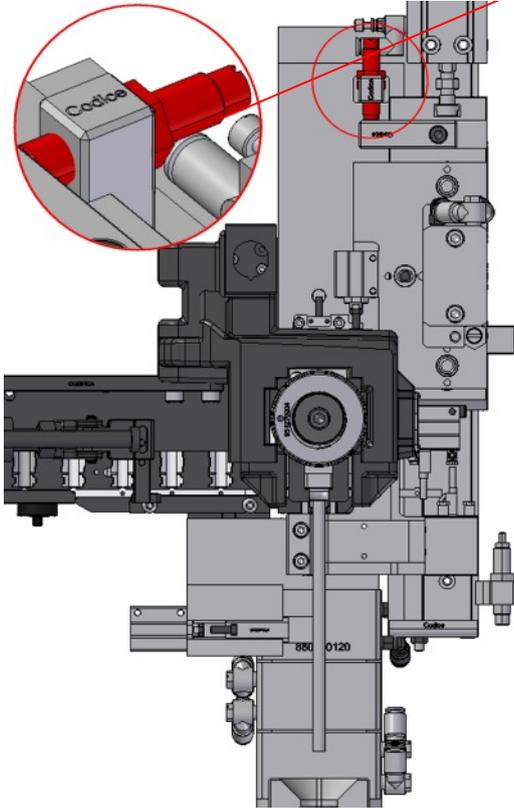


5.5.3) Crimping alignment table adjustment (B2)



The position of the body on the terminal is defined by table position adjustment.

Decelerator pitch 1



Loosen the decelerator fixing nut and unscrew the decelerator and fasten the nut.

Bring the table toward the decelerator, feed the terminal and move the table back so that the body is aligned on the terminal.

Unscrew the nut again on the decelerator.

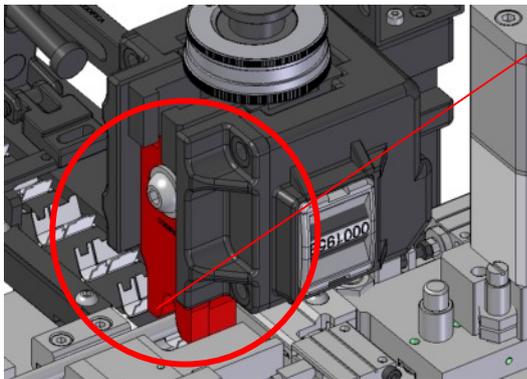
Adjust the decelerator so that the table is at travel limit on it. Re-tighten the nut.

Manually perform a crimping cycle and make sure that the knives slide freely and do not collide with any components on the table.

If crimping is not correct, adjust the decelerator again until the desired effect is achieved.

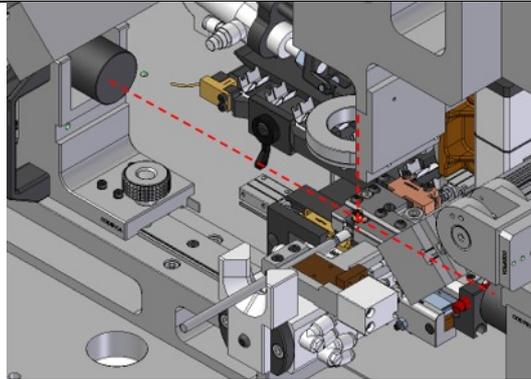
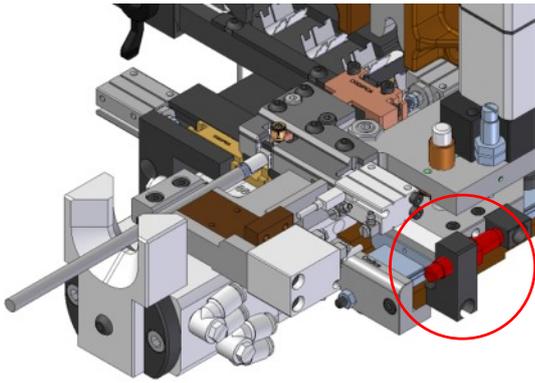
The table will stop earlier (toward the operator) when the decelerator is tightened.

The table will move further back when the decelerator is loosened.



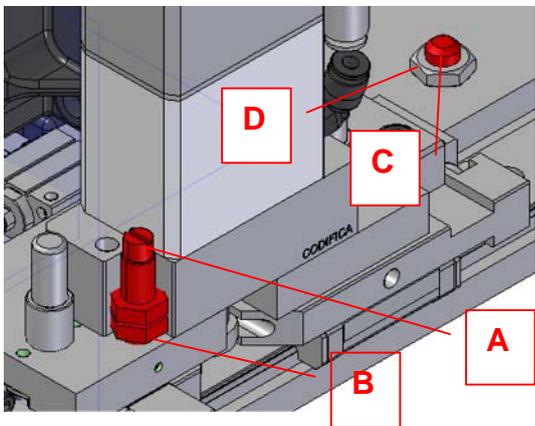
Knife sliding area

5.5.4) Table adjustment on the crimping area (B1)



Adjust the decelerator to stabilise wire centring with respect to the video cameras (see Chapt. 6.2).

5.5.5) Table adjustment on the crimping area (A2)



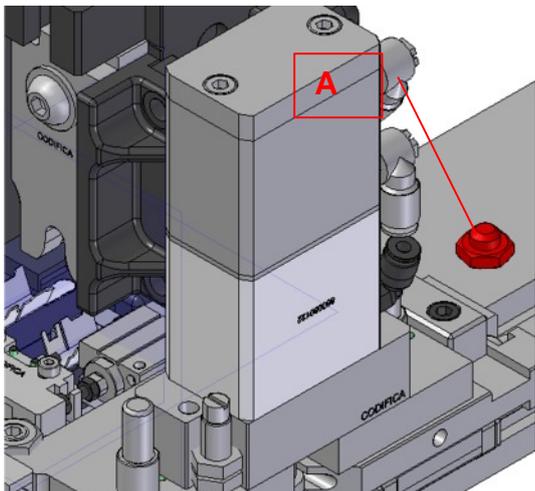
The body position on the terminal is adjusted by means of decelerator "A".

Before adjusting, make sure the nut "D" has been loosened and the dowel "C" has been completely unscrewed.

Unscrew the locking dowel "B", adjust the decelerator "A" and re-fasten the locking dowel.

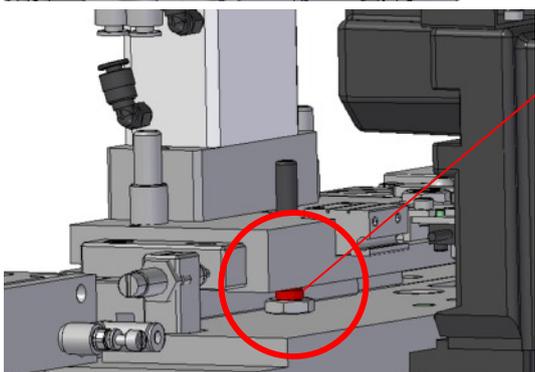
Make sure that the adjustment reflects the expected result with solenoid valve EV1.

5.5.6) Table adjustment on the crimping area (A2)



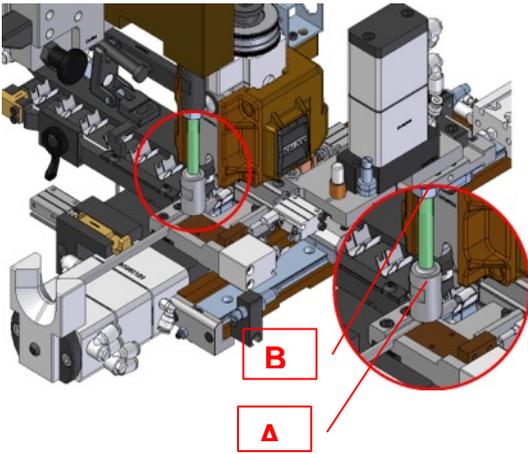
Dowel A has the role of reference during crimping, guaranteeing table stability and preventing any bending.

After having adjusted table descent, unscrew the fixing nut B, adjust the dowel by bringing it to travel limit under the table and re-tighten the nut.



Position the reference dowel under the table.

5.6) Cutting presser adjustment



The cutting presser is an element free from press and applicator movement. Its function is to contrast the force transmitted to the table during crimping and squashing. Presser "A" adjustment enables the table to maintain its position during crimping and squashing.

- Unscrew lock nut "B" on the presser.
- Tighten the presser (upward position).
- Move the table to crimping position.
- Unscrew the lock nut again on the presser.
- Unscrew the presser, resting it on the table.
- Re-fasten the nut.
-
- Check adjustment by activating solenoid valve EV15.

5.7) Display operation



The Home screen is composed of 4 selectable menus:

- Language
- Information
- Mode (see page 54)
- Settings (see page 54)



Select the icon  on the main menu to open the languages screen. Select the flag that corresponds to the desired language.



Info Screen  is divided into 3 sections:

- Counter: is not resettable and provides the total number of machine cycles.
- Reset the resettable counter. The operator can decide when to reset the count depending on need (i.e. reset the count to verify the last maintenance cycles).
- Batch: the batch quantity and count can be set with a countdown. The message BATCH DONE appears at the bottom left when the batch is completed



Mode Screen  is composed of 2 menu:

- Sel mode pressing the icon , it is possible to select AUTO (automatic) or STEP by STEP cycle function.
- Squashing: the squashing function can be activated or deactivated

by pressing the icon .

The command  brings you back to the main screen.



The settings screen  is composed of 2 menus:

- Buzzer: press the icon  to activate or deactivate the buzzer to signal:
 - Machine on
 - Errors on sensors
 - Errors detected by the fibre optics

- Adjustments: select the control  to access the screen for password entry, which sends the user to activate or deactivate the video camera function.

Caution: Request the password from Mecal and only make it available to maintenance personnel.

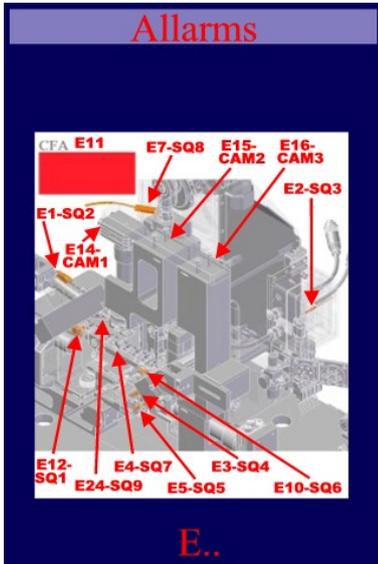


Video camera activation or deactivation screen:

- Camera top view  activates or deactivates the top camera

- Camera sides view  activates or deactivates the side cameras

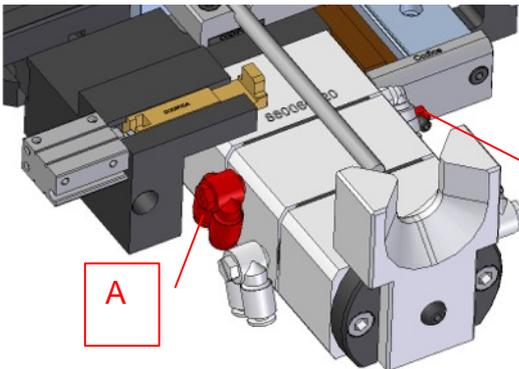
- Number of squashing  user can set the number of squashing operations to perform



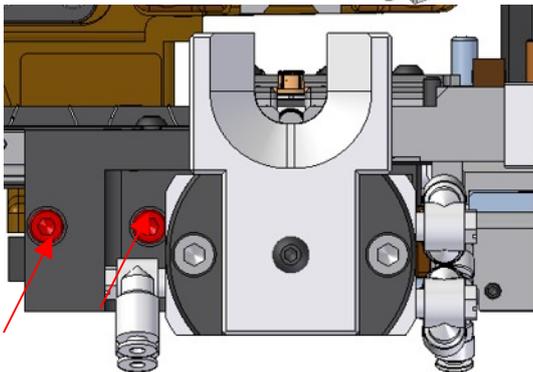
The alarms screen appears whenever the sensor detects an error. The image represents the position of sensors installed on equipment and relative errors, while the band underneath the figure signals the error.

6) Maintenance adjustments

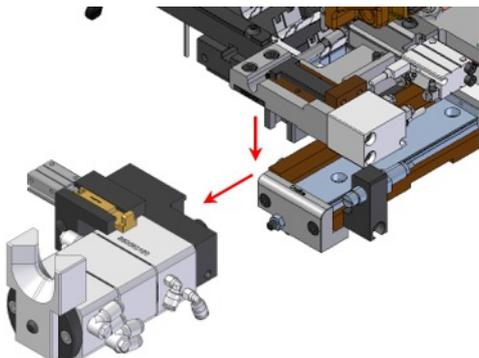
6.1) Anvil-floating blade-blade support-clamp replacement



Unscrew the pneumatic connection "A" and loosen the dowel nut and unscrew the dowel "B" to make the unit fixing screw accessible.

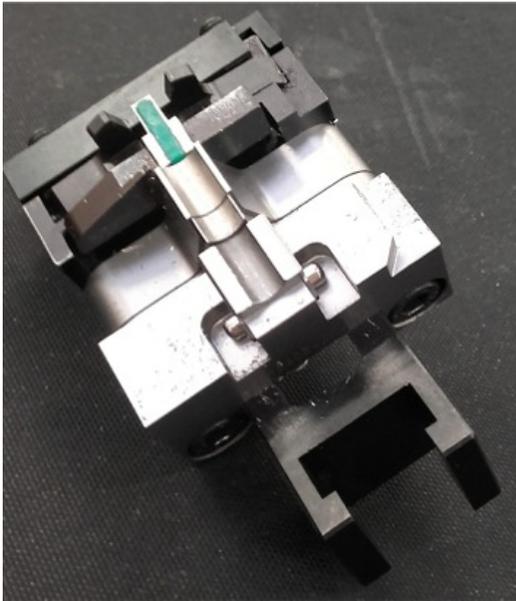
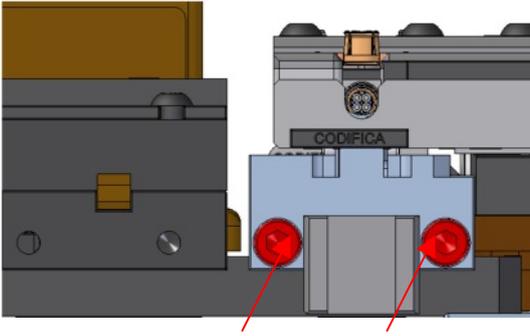


Unscrew the two fixing screws and remove the unit.



Remove the wire and cylinder support unit, disengaging it from the "T" shank, move it downward and forward.

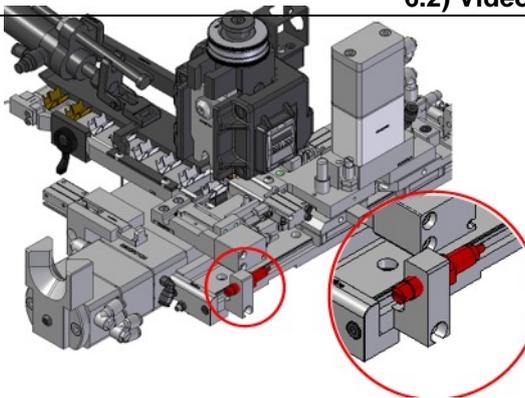
Unscrew the two screws and remove the anvil unit and remove the unit.



The anvils, floating blade support, floating blade are interlocked. Remove the component to be replaced and insert the new part. Assemble the parts in the opposite order with respect to the procedure described above.

6.2) Video camera centring adjustment

6.2) Video camera centring adjustment

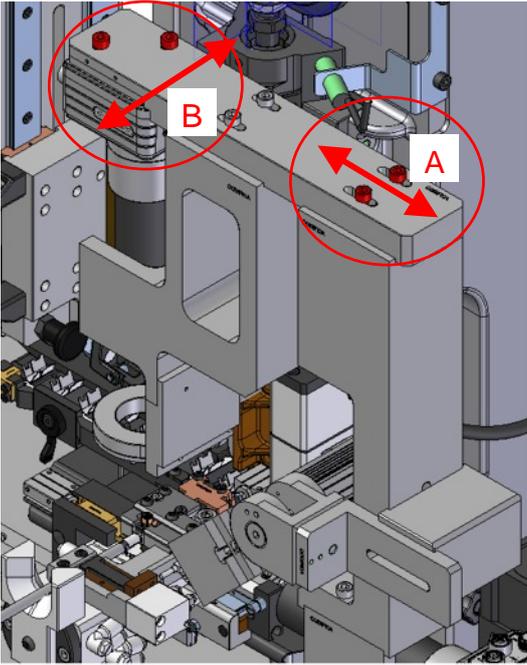


CAUTION: this adjustment is only to be performed if replacing the decelerator is absolutely necessary. Any operations made on the decelerator for centring the connector on the video camera axis could affect equipment operation.

Select LIVE mode on the video camera panel, adjust centring:

- Unscrew lock nut on the decelerator.
- Adjust the decelerator.
- Check the results of adjustment on the video camera.
- Lock the decelerator fixing nut after adjustments have been completed.

6.2) Top camera centring adjustment



CAUTION: this adjustment is only to be performed if absolutely necessary. Any operations made on the adjustment screws could affect equipment operation.

Select LIVE mode on the video camera panel, adjust centring in A:

- Unscrew the screws and move the unit until centring has been achieved.
- Verify correct centring on the video camera panel.
- Re-fasten the screws.

Centring "B" is performed to compensate for the deviation of axially between the side video cameras and the top camera. If the top camera is not centred, unscrew the screws "B", find optimal centring and re-fasten screws. **ATTENZIONE** questa regolazione è da effettuarsi solo in caso di estrema necessità. Qualsiasi intervento sulle viti di regolazione potrebbe inficiare il funzionamento dell'apparecchiatura.

7) Transformation 535-566

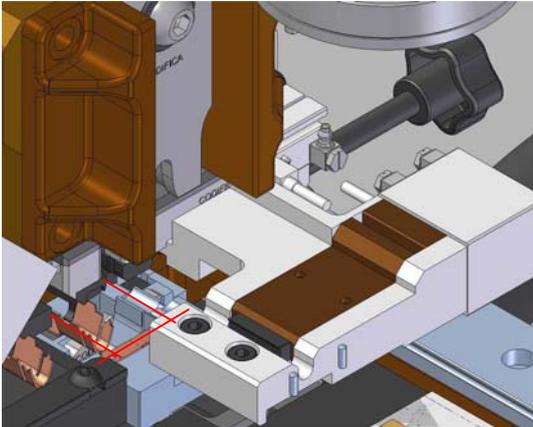
Follow instructions contained in chapters 3 and 5 to change the applicator relative to the wire being processed.

8) Working cycle

Make sure that equipment is on (see chapter 4).

Make sure that the applicator is adjusted (see Chapter 5.1, 5.2, 5.3).

Make sure that the message READY is present on the display



CAUTION:

Check that the terminal is positioned one pitch before the crimping area

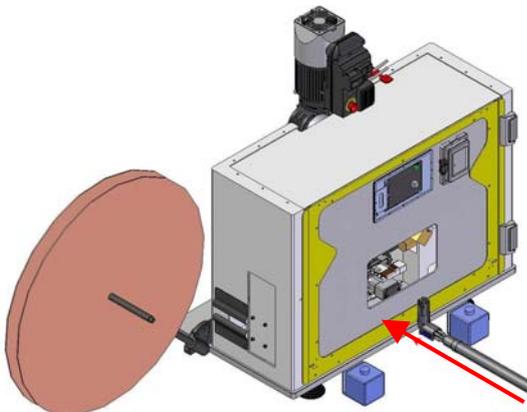
STEP 1. Display



Start-up of the first working cycle involves an initial phase in which the operator must select the desired program from the touch-screen panel, choosing from the following options:

- Select language
- Set the batch (optional, see page 53).
- Select the mode (see page 54).
- Set the buzzer and video cameras (optional, see page 54).

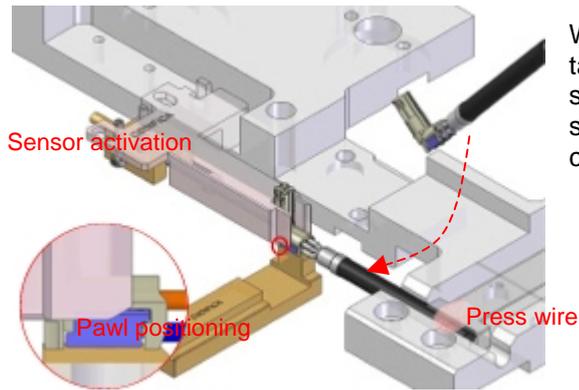
STEP 2. Cable insertion



Load the wire on board.

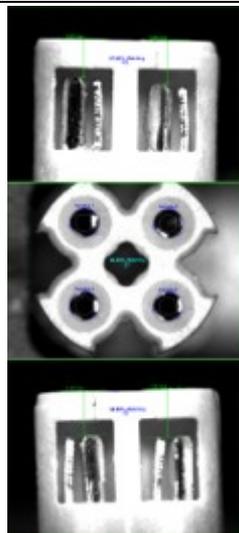
Be careful to make sure you have correctly inserted the connector in its support.

STEP 2.1



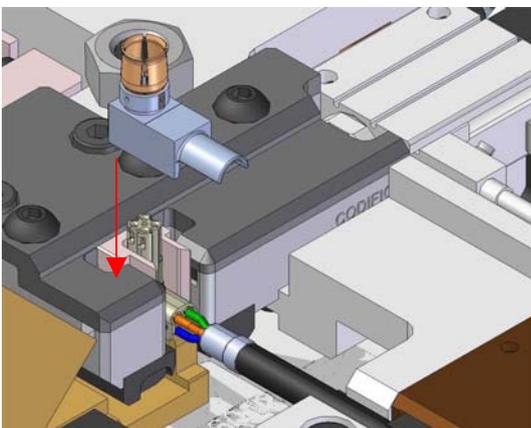
Wire insertion must be performed from the top downward, taking care to have the connector pawl enter under the support lever. Once the connector has been positioned, slightly press on the wire to switch the sensor which gives consent to lock it.

STEP 3. Video camera consent



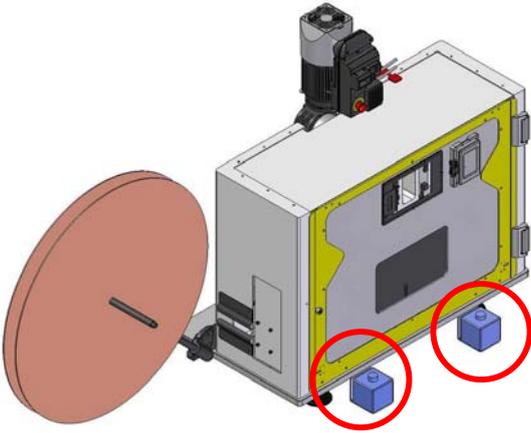
At the same time the wire is locked, the video cameras photograph and verify the quality of the process occurred in station 6. In sequence, they evaluate the left side, from the top, and the right side.

STEP 4. Body insertion



Insert the body manually and slightly press, bringing it to travel limit on its mechanical reference.

STEP 5. Cycle start-up



Activate the two-hand control, the mobile guard closes to protect the moving parts area. When casing closes, the side video cameras detect the presence of the body and start up the cycle.

STEP 6. Cycle end

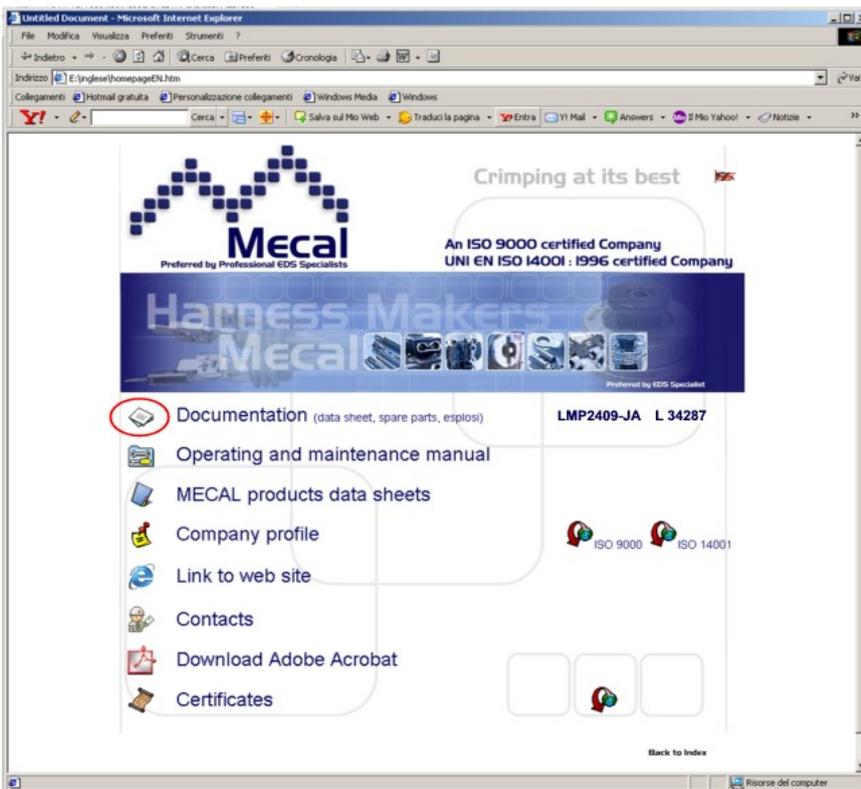
At the end of the cycle, the mobile guard opens automatically, the wire is freed and the operator can remove it.

9) Maintenance

!! Before performing any operations, always switch off the machine, check and cut off power from the main switch!!

9.1) Spare parts

Only install spare parts with the correct code number contained on the part and included in the documentation in the attached CD. For correct use and for good quality, use **original spare parts** only.

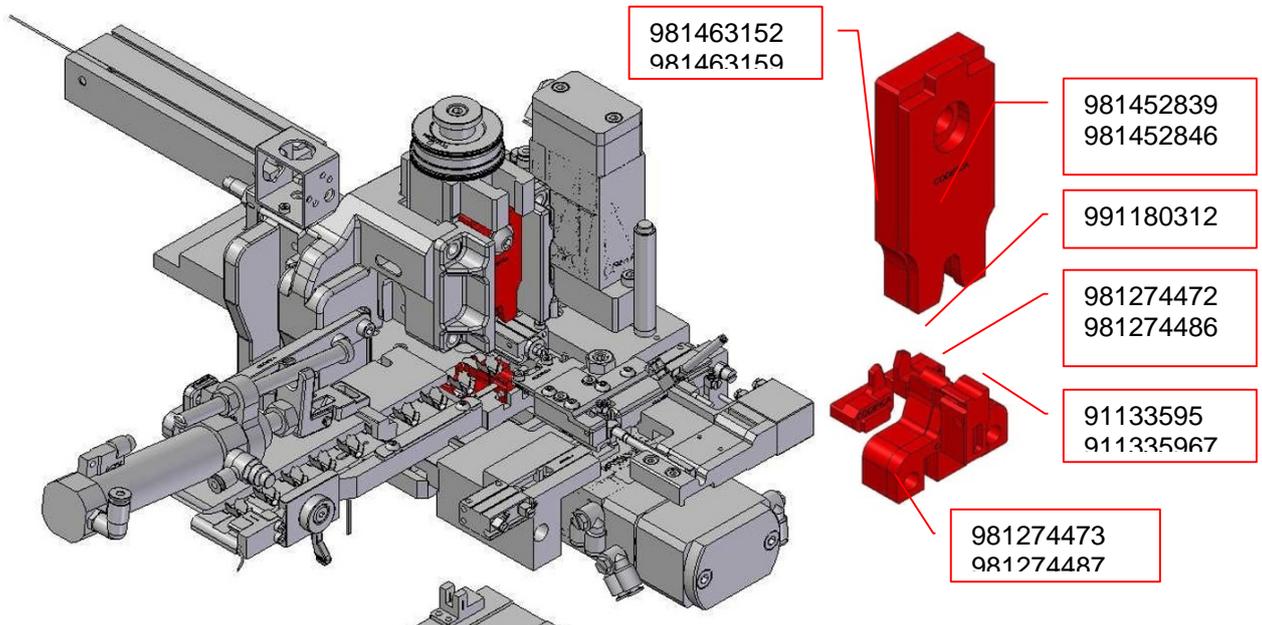


Download files in .pdf format via the "Documents" icon to access the BOM with part codes and reference to identification shown in the exploded diagram. Verify that the model and serial number correspond with the applicator in question..

9.2) Spare parts recommended by Mecal

To improve maintenance processes, Mecal recommends the purchasing of some parts that are sensitive to wear

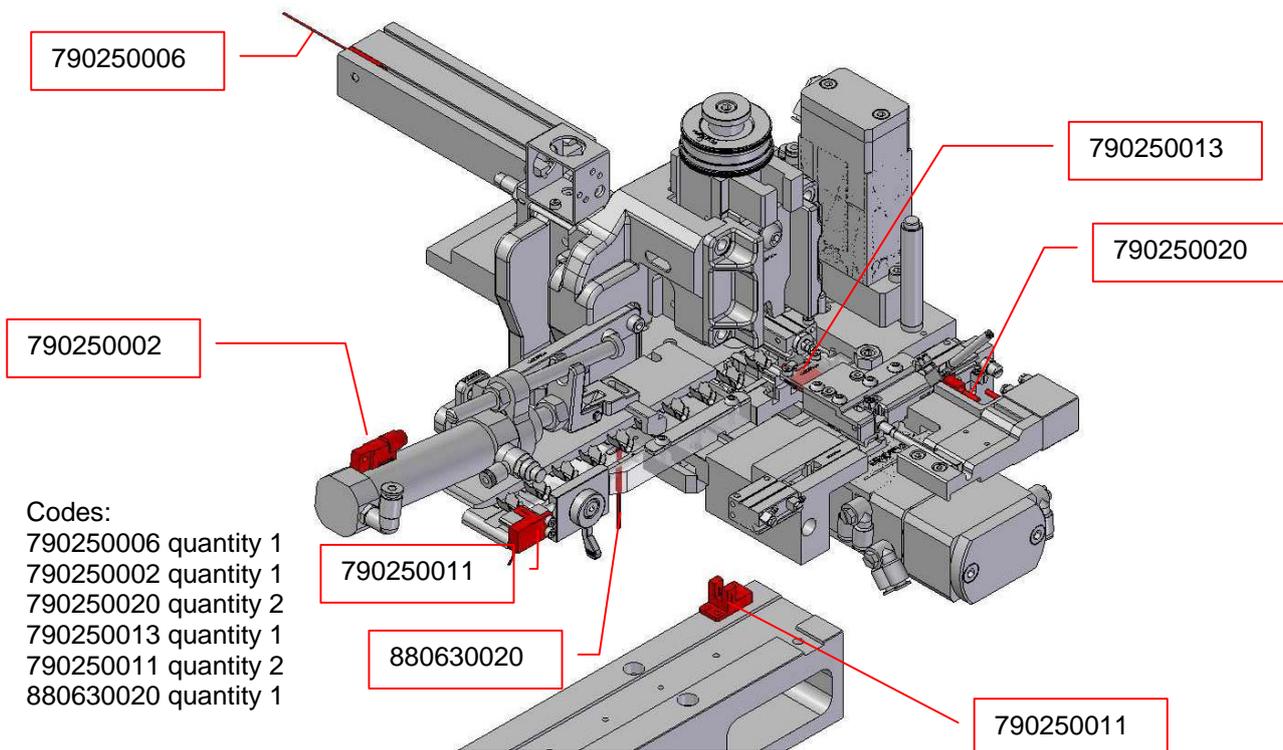
9.2.1) Cutting tool spare parts



codes LMP 6627:
 981452839 quantity 1
 981463152 quantity 1
 911330595 quantity 1
 981274473 quantity 1
 981274472 quantity 1
 991180312 quantity 2

codes LMP 6628:
 981452846 quantity 1
 981463159 quantity 1
 911330596 quantity 1
 981274486 quantity 1
 981274487 quantity 1
 991180312 quantity 2

9.2.2) Sensor spare parts



Codes:
 790250006 quantity 1
 790250002 quantity 1
 790250020 quantity 2
 790250013 quantity 1
 790250011 quantity 2
 880630020 quantity 1

9.3) Example of documentation

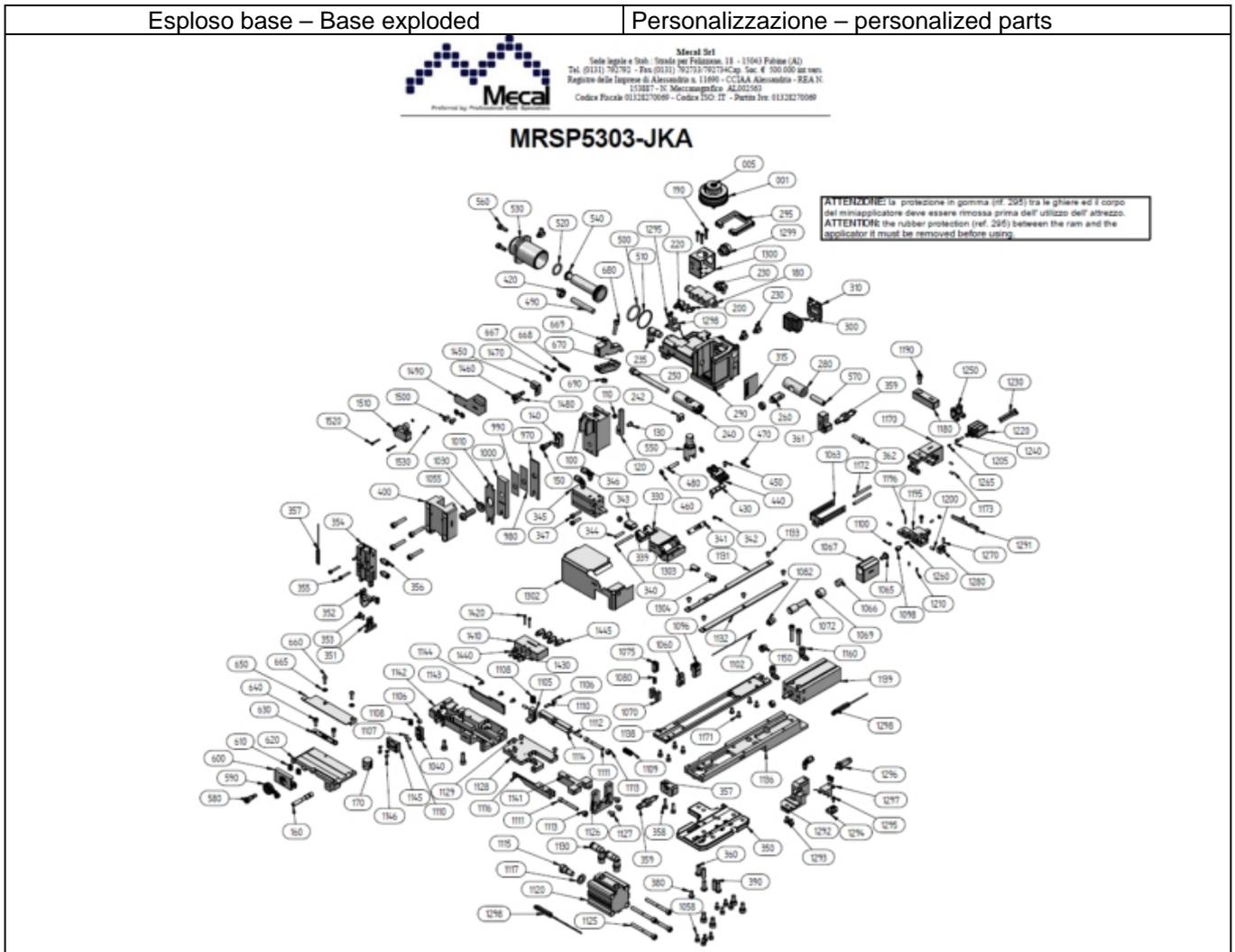
Example of documentation.

- Pg.1 Data sheet complete with information relating to mini-applicator identification and testing
- Pg.2 BOM
- Pg.3 Representation of base mini-applicator parts

Pg.4 Representation of personalized parts and high-wear parts of the mini-applicator

Esplodo base – Base exploded

Personalizzazione – personalized parts



MECAL recommends saving files related to the BOM, data sheets and exploded diagrams inherent to the machine on the PC, to make a secure backup and a simpler search by serial number if you have multiple machines.

9.4) Cleaning

During the working cycle, clean equipment and the workstation at least every 8 hours. Periodically clean the machine using non-aggressive products so as to preserve machine characteristics over time.

IMPORTANT!! : Do not use alcohol or alcohol-based products to clean the transparent protections but use soap and water only. The use of alcohol-based products weakens protections.

9.5) Storage

When equipment is not used for a prolonged period of time, perform the required cleaning operations. Before setting it in the warehouse, spray all its parts with a layer of protective oil. It is advisable to take note of the number of cycles of the equipment shown on the counter located on the display to best manage the wear and requirements of spare parts.

9.6) Demolition and disposal

Applicator disposal is subject to directive listed below:



User information

Part of the Operating Instructions Scrupulously store and comply with equipment

All instructions contained in this information are general safety precautions which we strongly recommended following. They may not however only specifically relate to single parts or procedures relating to use and may necessarily appear in other parts of this publication and/or in instructions for use of other pieces of equipment, of which they are an integral part.

WEEE Policy

Under Article 13 of Legislative Decree 25 July 2005, n. 151 "Implementation of Directives 2002/95/EC, 2002/96/EC and 2003/108/EC, regarding the reduction of hazardous substances in electrical and electronic equipment, including the disposal of waste."

"SEPARATE COLLECTION"

The wheeled bin symbol on the equipment or packaging indicates that the product must be collected separately from other waste at the end of its life.

The user must therefore give or (have a third party give) equipment at end of life to the appropriate differentiated collection centres for electronic and electro-technical waste, or return it to the dealer upon purchase of a new equipment of equivalent type, in the ratio of one to one.

Appropriate separate collection for the subsequent recycling, treatment and environmentally compatible disposal of decommissioned equipment helps prevent negative impact on the environment and health and promotes the re-use and/or recycling of the materials making up the product.

Illegal dumping of the product by the user entails the application of administrative penalties (Article 255 and on of Legislative Decree N. 152/06) provided by law.

When disposing of the individual parts of the press due to replacement, we recommend the following CER codes:

Iron, Steel	CER 170409
Copper, Bronze, Brass	CER 170401
Aluminium	CER 170402
Plastic material	CER 170203
Used oil	CER 130205
Electrical parts	CER 160214

These codes are indicative and it is the responsibility of the equipment owner to ensure the correct disposal mode and codes.

10) Ricerca guasti e risoluzione problemi

Defect	Possible cause	Operation
The Magnum applicator is not locked correctly on the corresponding press baseplate.	<ul style="list-style-type: none"> The contact surfaces are not clean. The applicator is not correctly centred under the press. 	<ul style="list-style-type: none"> Clean the support surfaces, removing any processing residue deposited or any waste. Verify the positioning of the "T" shank and the press baseplate.
During the test cycle, manually implemented with a suitable wrench, mechanical impediments are encountered on BDC passage.	<ul style="list-style-type: none"> The press has not been set to the correct height at Bottom Dead Centre 135.8 mm. The adjusting ring on the applicator is too open, toward 2.7. The rubber protection on the crimper has not been removed. 	<ul style="list-style-type: none"> Verify the press height with the appropriate instrument (see point 3.4). Check the position of the adjusting rings. The more open position with respect to the values listed can cause interference between the crimper and the anvil (see point 3.6). Remove the rubber protection on the crimpers.
The terminal does not fit in the feeding guide.	<ul style="list-style-type: none"> The clutch has not been deactivated and therefore the terminal is not able to pass. It is not the correct terminal for the applicator. 	<ul style="list-style-type: none"> Release the clutch eccentric or the corresponding lever to deactivate it and enable terminal outfitting. Verify that the terminal part number on the reel corresponds to the terminal p/n on the applicator data plate.
Terminal feeding is not running correctly.	<ul style="list-style-type: none"> Incorrect air pressure Incorrect engaging of the terminal on the feeding finger Clutch deactivated 	<ul style="list-style-type: none"> Check system air pressure, it should be between 0.5 and 0.6 MPa (5-6 BAR). Make sure that the feeding finger engages the terminal in the correct hole of the strip (side feed) or the copper/resin fins (end feed). Make sure that the clutch is activated on the applicator after terminal outfitting.
Incorrect terminal position on the crimping axis	<ul style="list-style-type: none"> Press cycle not complete. Feeding parts may be worn. Terminal unwinding from the reel is defective. 	<ul style="list-style-type: none"> In manual mode, repeatedly perform cycles on the press, checking correct terminal engaging and positioning. Recover feeding part wear by performing adjustments described in points 5.1 and 5.2. Make sure the reel unwinding occurs correctly, without any mechanical impediments or high resistance. This could cause abnormal bending.
The crimping terminal is deformed.	<ul style="list-style-type: none"> Crimping height is incorrect for the wire cross-section used. The terminal may not be aligned with the crimper. The crimper may be worn or damaged. Incorrect wire cross-section The table may not be correctly adjusted. 	<ul style="list-style-type: none"> Compare the position of the adjusting ring with the values declared on the data plate (see point 5.3) and check the crimping height with the appropriate instrument (centimetre or micrometer calliper). Check the position of the terminal on the crimping axis and adjust as described in point 5.1 and 5.2. Check the crimpers, cutters and anvils to make sure they are not worn or damaged. Replace immediately if necessary. Make sure that the cross-section of the wire used corresponds to the working position. Check table adjustment (Chapt. 5.5).
The cycle does not start.	<ul style="list-style-type: none"> Equipment does not start up electrically. The press does not start up electrically. The left video camera is not correctly positioned. The material to be processed has not been loaded. 	<ul style="list-style-type: none"> Make sure that the main switch is in position 1 (on). Make sure that the press switch is in position 1 (on). Make sure that the left video camera is at travel limit against the mechanical stop and that the sensor is switched.

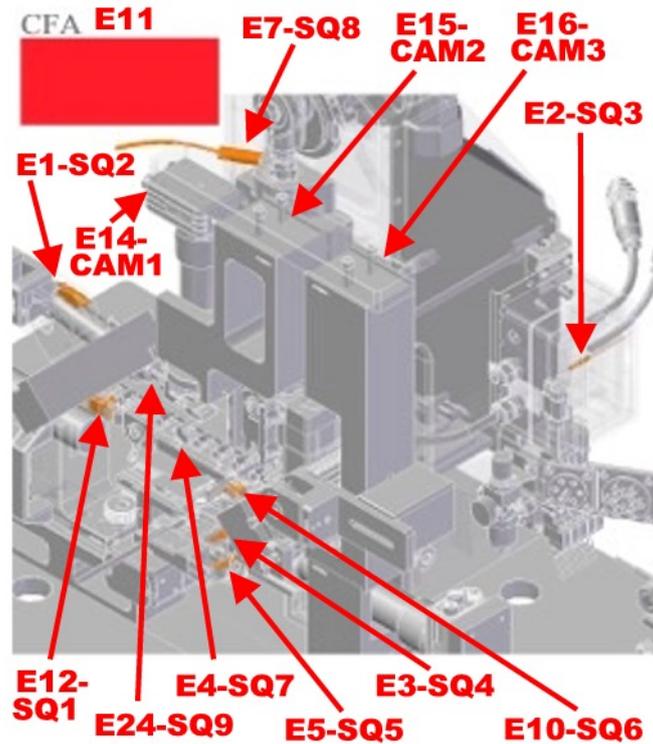
	<ul style="list-style-type: none"> • The body is not correctly inserted. • The pneumatic system is not being powered. • The video cameras are not reading or more than one sensor is in error conditions. 	<ul style="list-style-type: none"> • Make sure that the wire is correctly inserted, point 6 step 3.1. • Make sure that the body has been inserted. • Make sure that the body has been inserted correctly. • Check system air pressure, it should be between 0.6 and 0.7 MPa (5-6 BAR). • Check the errors table.
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ERROR CODE	SENSOR MESSAGE	MEANING	SOLUTIONS
E1	SQ2	Terminal feeding cylinder sensor	<ul style="list-style-type: none"> - The pneumatic system is not connected→ Connect system -The sensor cable may be broken→ replace sensor - The sensor is not secured suitably, check screws→ Tighten them if necessary - Make sure that they are correctly adjusted -Make sure that there are no impediments to cylinder stroke.→ Clean the area, removing the impediment. -The sensor may be burnt→ Replace the sensor
E2	SQ3	Slide cylinder sensor	<ul style="list-style-type: none"> - The pneumatic system is not connected→ Connect system -The sensor cable may be broken→ Replace sensor - The sensor is not secured suitably, check screws→ tighten them if necessary - Make sure that they are correctly adjusted -The table is not in the correct position. Make sure that there are no impediments to cylinder stroke.→ Clean the area, removing the impediment. -The sensor may be burnt—→ Replace the sensor
E3	SQ4	Body block cylinder sensor	<ul style="list-style-type: none"> - The body may not have been inserted correctly→ Check the position of the body on the insulator - The pneumatic system is not connected→ Connect system -The sensor cable may be broken→ Replace sensor - The sensor is not secured suitably, check screws→ Tighten them if necessary - Make sure that they are correctly adjusted. -The sensor may be burnt—→ Replace the sensor
E4	SQ7	Terminal presence optical fibre	<ul style="list-style-type: none"> - The optical fibre has not been secured suitably, check fastening→ Tighten them if necessary - Make sure that the amplifier is reading fibre data. - The fibre may be dirty→ Clean if necessary. - The fibre may be burnt→ Replace it - Check the conditions of the terminal reel→ Replace if necessary

E5	SQ5	Wire locking cylinder sensor	<ul style="list-style-type: none"> - The pneumatic system is not connected→ Connect system -The sensor cable may be broken→ Replace sensor - The sensor is not secured suitably, check screws→ Tighten them if necessary - Make sure that they are correctly adjusted. -The sensor may be burnt—> Replace the sensor
E7	SQ8	Press ram sensor	<ul style="list-style-type: none"> -The sensor cable may be broken→ Replace sensor - The sensor is not secured suitably, check screws→ tighten them if necessary - Make sure that they are correctly adjusted - The sensor may be burnt—> Replace the sensor. - The negative part of the cam is near the end stop. - The end stop on the press is too far from the cam→ Adjust it to a distance of 1.5 mm from the cam
E10	SQ6	Cycle start-up sensor	<ul style="list-style-type: none"> - Make sure that the material to be processed has been loaded correctly. - The pneumatic system is not connected→ Connect system -The sensor cable may be broken→ Replace sensor - The sensor is not secured suitably, check screws→ tighten them if necessary - Make sure that they are correctly adjusted -The sensor may be burnt—> Replace the sensor
E11	CFA	Load cell	<ul style="list-style-type: none"> - Make sure that the load cell is active.
E12	SQ1	Strip presence sensor	<ul style="list-style-type: none"> - The strip has not been inserted correctly→Check positioning - The terminal is finished→Load a new reel - The strip is broken→ Re-insert the strip -The sensor cable may be broken→ Replace sensor - The sensor is not secured suitably, check screws→ tighten them if necessary - Make sure that they are correctly adjusted. -The sensor may be burnt—> Replace the sensor
E14	CAM1	Video camera not ready	<ul style="list-style-type: none"> -Video camera is offline→ Reset online - Make sure that the video camera is connected correctly. - Video camera fault→Contact Mecal
E16	CAM2	Video camera not ready	<ul style="list-style-type: none"> -Video camera is offline→ Reset online - Make sure that the video camera is connected correctly. - Video camera fault→Contact Mecal
E18	CAM3	Video camera not ready	<ul style="list-style-type: none"> -Video camera is offline→ Reset online - Make sure that the video camera is connected correctly. - Video camera fault→Contact Mecal
E20	CAM1	No signal end of work	Video camera damaged, contact Mecal.
E21	CAM2	No signal end of work	Video camera damaged, contact Mecal.
E22	CAM3	No signal end of work	Video camera damaged, contact Mecal.

E24	SQ9	Cam 1 slide sensor	Incorrect video camera position → Check position - The sensor is not secured suitably, check screws → tighten them if necessary - Make sure that they are correctly adjusted. - The sensor may be burnt → Replace the sensor
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11) Error signals



MASTER CARD (mini)		
ERROR CODE	SENSOR MESSAGE	MEANING
E1	SQ2	Cylinder sensor. terminal feeding
E2	SQ3	Cylinder sensor. slide
E3	SQ4	Cylinder sensor. body block
E4	SQ7	Terminal presence optical fibre
E5	SQ5	Cylinder sensor. wire locking
E7	SQ8	Press ram sensor
E10	SQ6	Cycle start-up sensor
E11	CFA	Load cell
E12	SQ1	Strip presence sensor
SLAVE CARD (video cameras)		
E14	CAM1	Video camera not ready
E16	CAM2	Video camera not ready
E18	CAM3	Video camera not ready
E20	CAM1	No signal end of work
E21	CAM2	No signal end of work
E22	CAM3	No signal end of work
E24	SQ9	Cam 1 slide sensor

Should an abnormality occur, make sure that the sensor involved in the "error" is not blocked or obscured by machining scrap, that the pneumatic system is pressurised and that sensors are not damaged or disconnected.

12) After sales service

For any remaining unresolved problems or questions, notify MECAL technical support at these contacts:

Tel: +39 0131 792792 (hours 8:00am – 12:00pm / 1:30pm – 5:30pm from Mon. to Fri.)

Fax +39 0131 792733

e_mail support@mecal.net

