Mecal Srl
Sede legale e Stab.: Strada per Felizzano, 18 - 15043 Fubine (Al)
Tel. (0131) 792792 - Fax (0131) 792733/792734Cap. Soc. € 500.000 int.vers.
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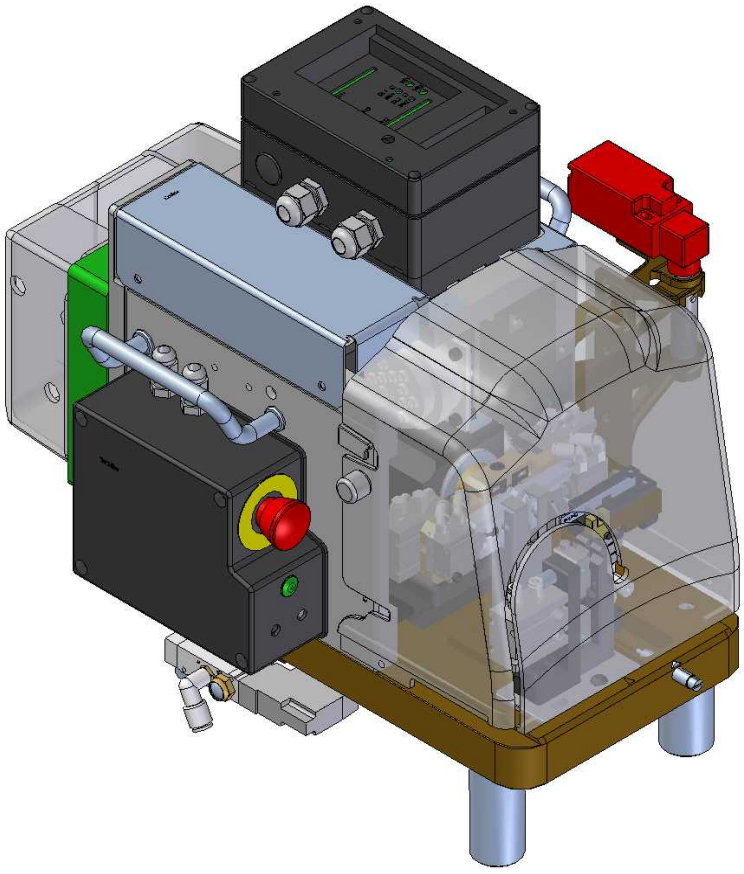
USE AND MAINTENANCE MANUAL
3_HSD PEELING STATION

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.



MECAL s.r.l.

Strada per Felizzano 18
Fubine (AL) 15043
Italy

Phone: +39 0131 792792
Fax: +39 0131 792733
Email: sales@mecal.net
Web: www.mecal.net

These instructions were created in September 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.

Contents

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.

2) General instructions

2.1) Use

The Peeling Station is one of the steps along the Mecal HSD (High Speed Data) cable production line.
The equipment is equipped with a 270° rotating system for the cutting and removal of aluminium film. Once cutting has been performed, the blades return to the start cycle position and the clamp removes the peel film, bringing the waste to the correct scrap container.

The station is equipped with a fixed guard that protects the working area during the machine cycle.

Equipment is intended for use in industrial environments. The machine can only be used for the cutting and removal of aluminium film from HSD cables. Its use for any application other than specified is **STRICTLY PROHIBITED**.

2.2) Technical information

HSD Peeling station

ID	PL10
CODE	201000053
AIR PRESSURE	5-7 BAR
AIR CONSUMPTION	2.19 dm³/min per cycle
DIMENSIONS (mm)	W324,5xH520XD450
DIMENSIONS ("")	W12,76xH20.47xD17.7
WEIGHT	15 Kg (33.1 lb)
POWER SUPPLY	110-240V 50-60Hz
CABLE CROSS-SECTION	HSD Dacar® 566
CYCLE TIME Marking	approximately 3.50 sec
CYCLE TIME with aluminium removal	approximately 7.50 sec

2.3) Inspection upon delivery

Equipment is delivered in a separate package containing:

- Equipment
- CD containing use and maintenance instructions

(Optional) upon request:

- Spare parts kit

Upon delivery:

-  Verify by checking the accompanying document that the equipment has not been damaged and that there are no missing parts.

-  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

Equipment model

Application

Serial number

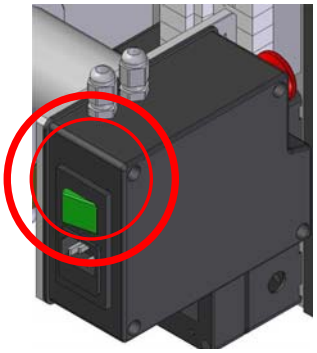
Year of production

Electrical power

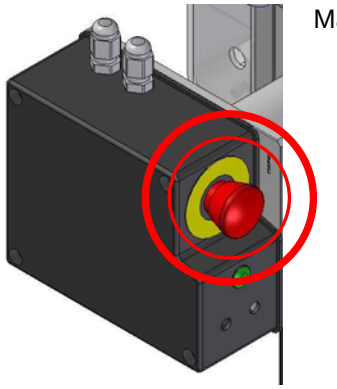
Pneumatic system pressure

2.5) Safety requirements

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



Switch off the machine via the main switch located at the rear of the machine.



Make sure that the green warning light located under the emergency button is off.

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

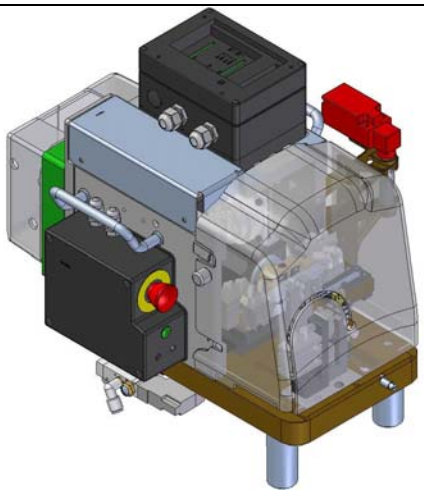
Announce operations on the line switch.

CAUTION read the following carefully:

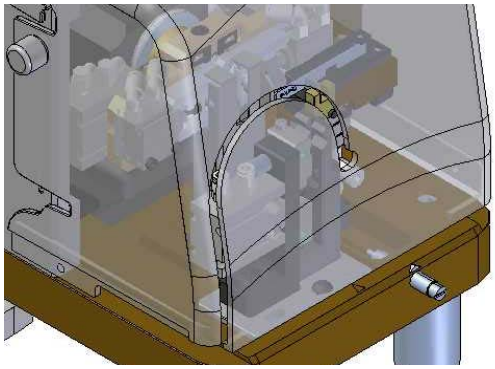
- Equipment is provided with safety protections which, if removed, prevent operation.
- Do not attempt to use equipment without safety protection.
- Modifying protection slots or guards aimed at hindering the insertion of fingers or hands in moving parts is prohibited. Do not tamper with or inhibit microswitches 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 cable for which it has been designed.

No more than one operator can work on each piece of equipment.

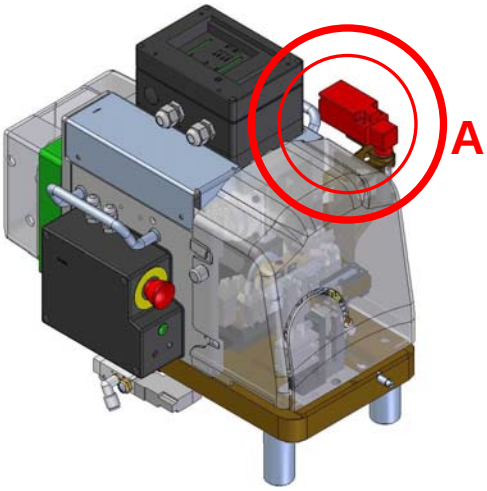
2.6) Protections



HSD Peeling Station equipment is equipped with a fixed guard that protects the working area during the machine cycle. The casing is composed of Lexan technopolymer material (thickness 3mm) and has been designed to guarantee operator safety during the various production phases.

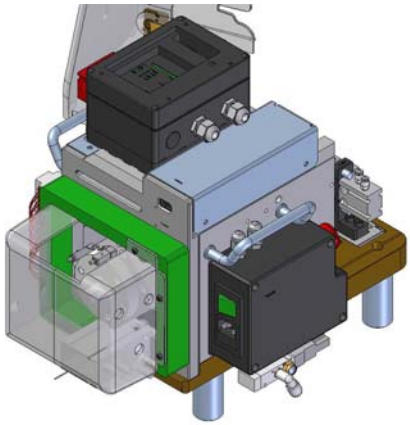


The casing has a special slot that allows for the extraction of cable at the end of the cycle without compromising the sheath flap.



CAUTION: all maintenance operations must be carried out with the machine in emergency conditions and switched off. Electronically and pneumatically disconnect equipment.

Open the fixed casing by removing the captive screw located on the left side and rotate the casing toward the right to access moving equipment parts.
The rotating pin sensor (A) installed on the casing rotation axis ensures safety: the sensor detects door opening and cuts off equipment power, preventing movement. Power is automatically restored upon return to closed position.



The rear part of the machine is protected by two fixed guards.

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 and switched off and the air inlet closed.

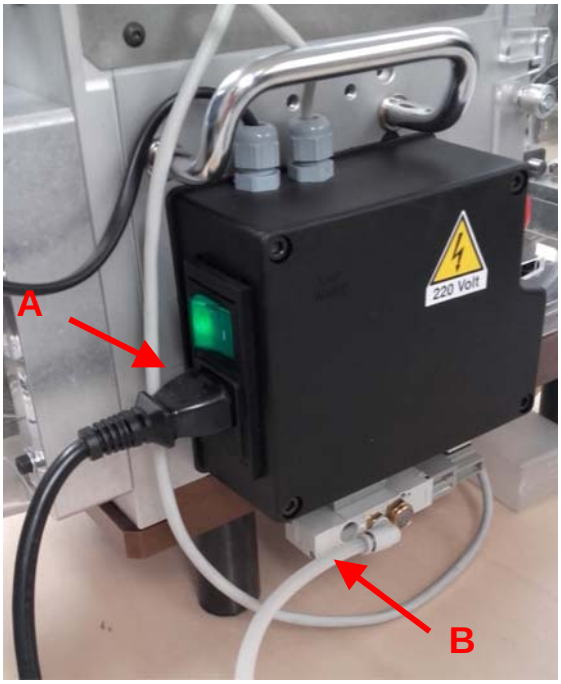
3.1) Unpacking, lifting and transport

- Use proper equipment to handle packaging.
- Make sure that there is no damage to equipment and that there are no missing parts, checking the accompanying document.
- If any anomalies are detected, inform Mecal no later than 10 days from the date of receipt.
- Equipment is provided with eyebolts or appropriate grip areas for handling. Use these with appropriate mechanical systems to position it.
- 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

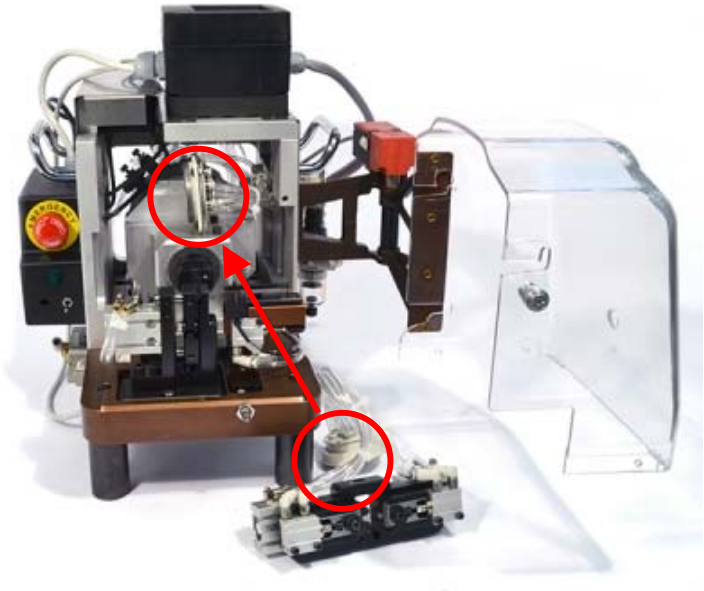
The main electrical and pneumatic connections are on the left side of the equipment.

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



3.2.1) Pneumatic connection

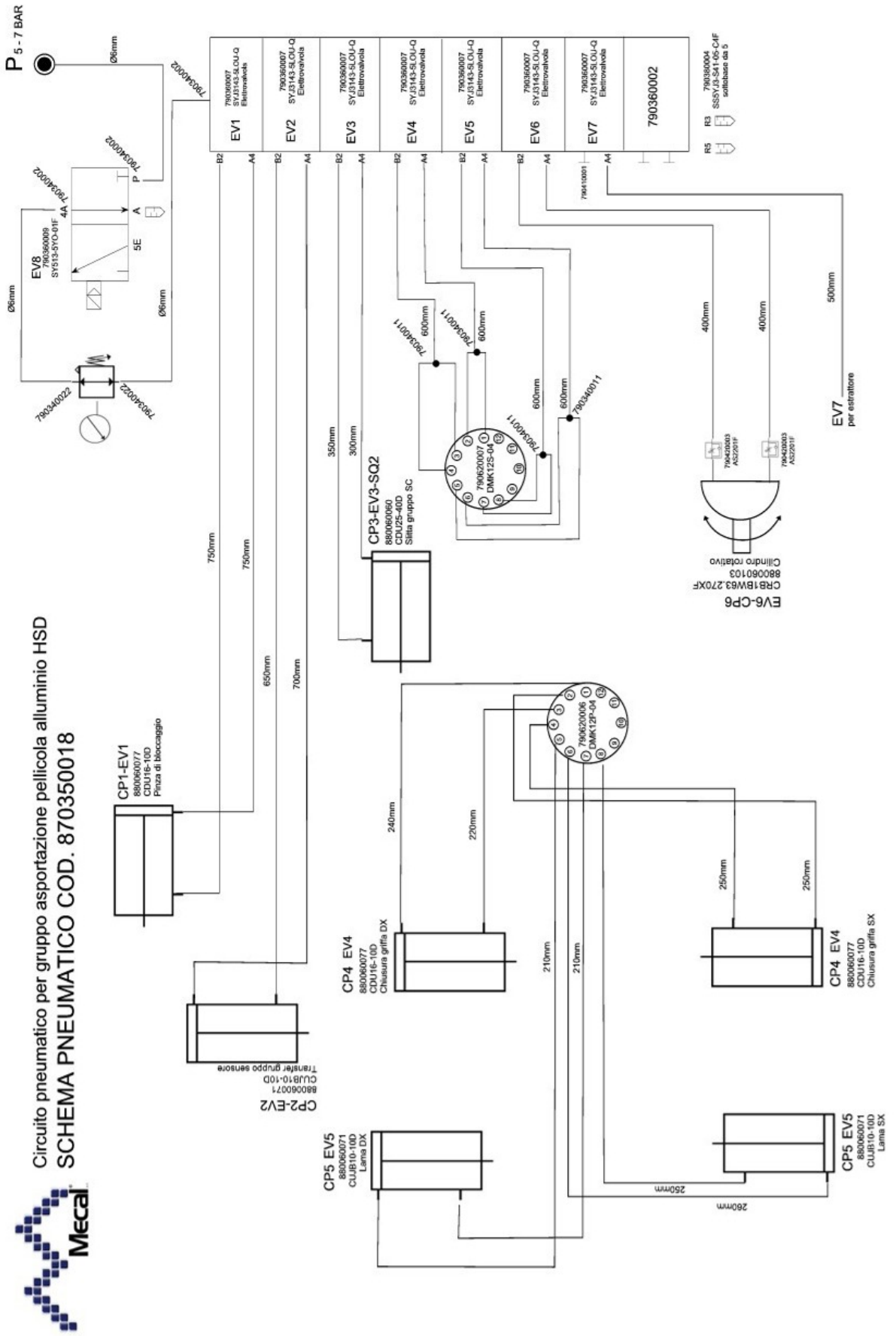
CAUTION: to avoid collisions, make sure there are no mechanical obstructions on all moving systems before connecting all the pneumatic components.



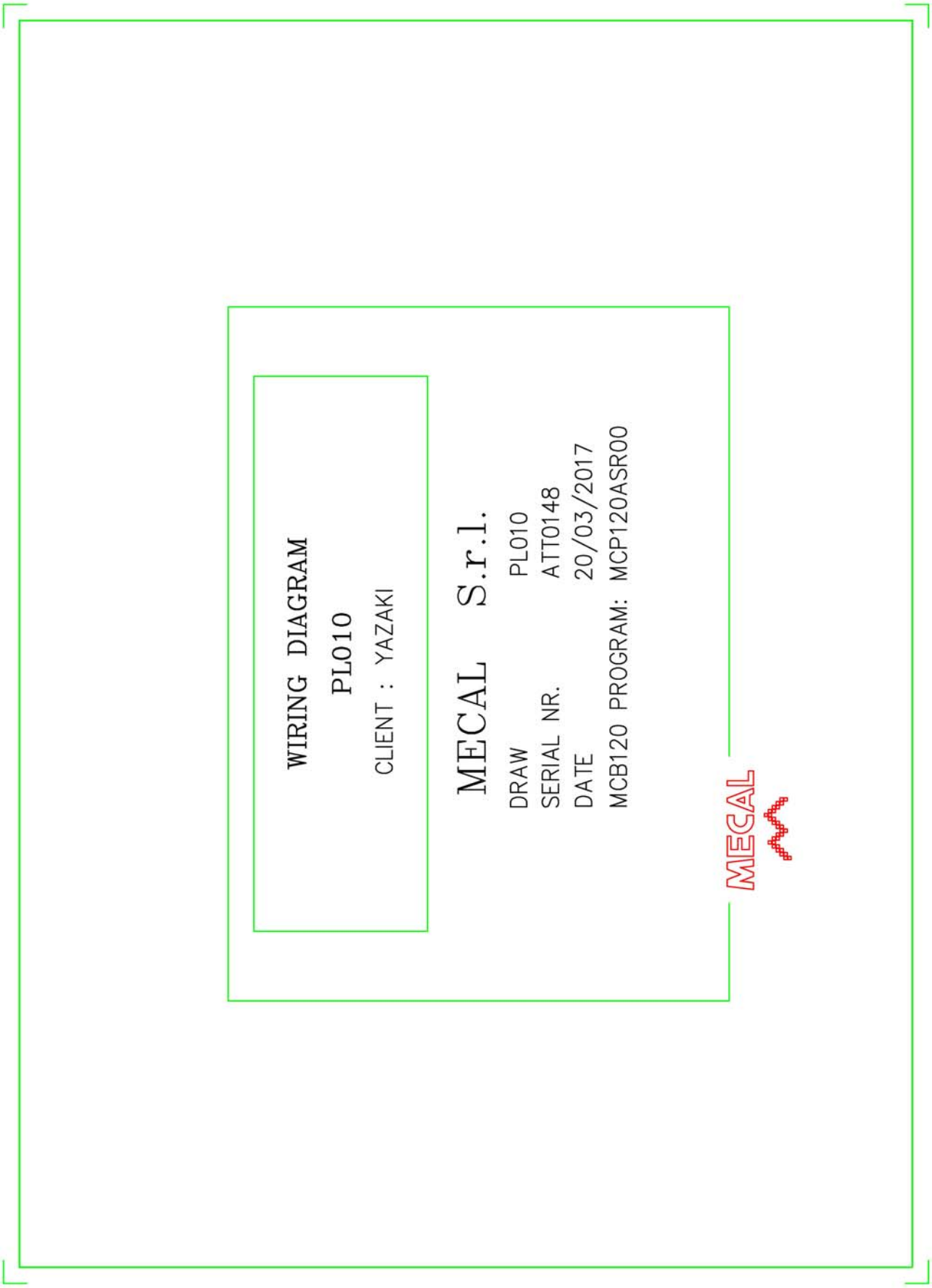
Connect the flying pneumatic connectors, located on the aluminium film cutting block, with the panel pneumatic connectors on the equipment. Make sure that the locking washers are inserted and tightened.

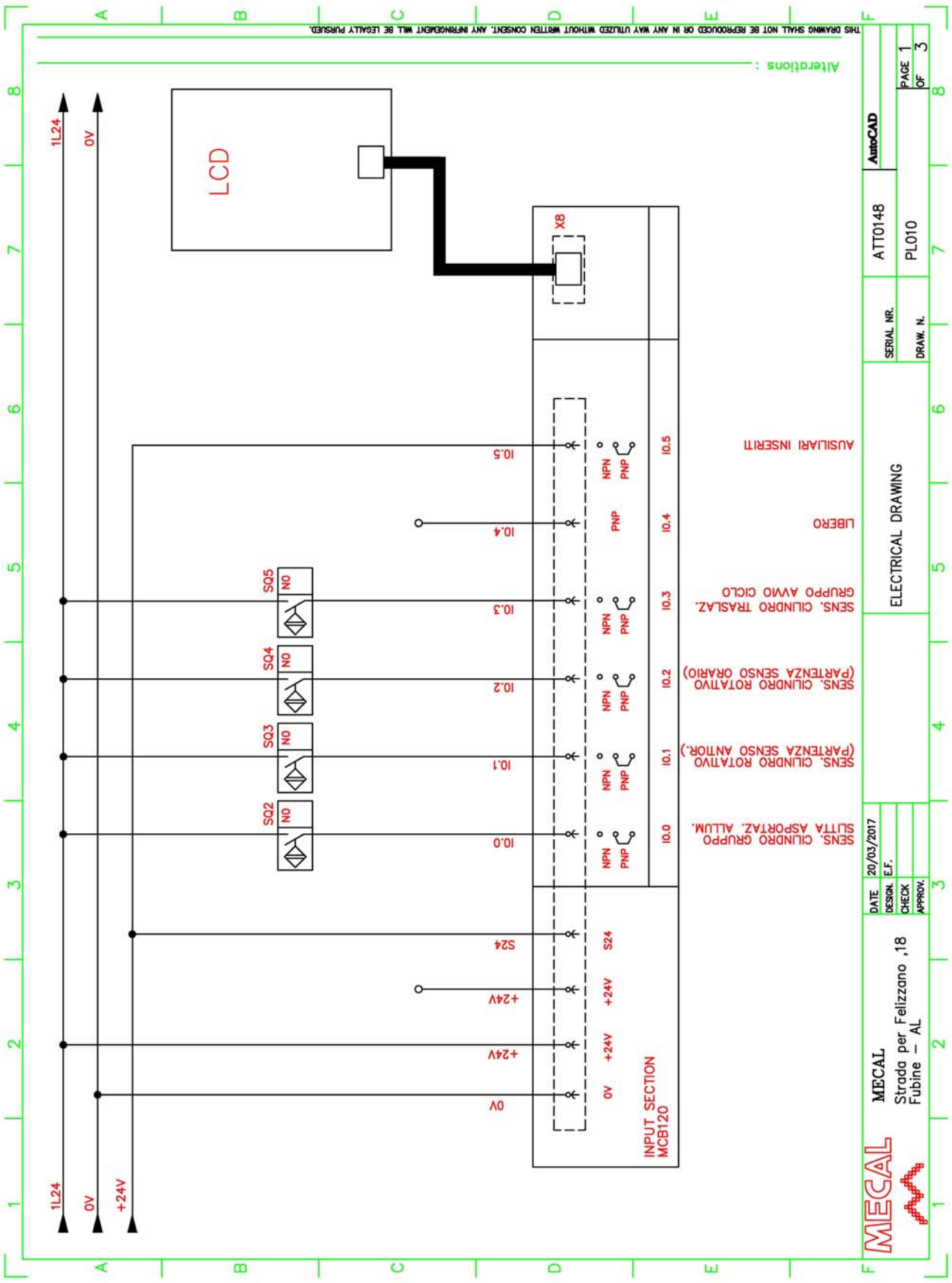
CAUTION: all connector connecting operations should be carried out with the press in emergency conditions or switched off and without air in the system.

3.3) Pneumatic diagram



3.4) Esquema elétrico




LCD
X8
1L24
0V
+24V
SQ2
SQ3
SQ4
SQ5
NO
I0.0
I0.1
I0.2
I0.3
I0.4
I0.5
NPN
PNP
SENS. CILINDRO GRUPPO SLITTA ASPORTAZ. ALLUM.
SENS. CILINDRO ROTATIVO (PARTENZA SENSO ANTIOR.)
SENS. CILINDRO ROTATIVO (PARTENZA SENSO ORARIO)
SENS. CILINDRO TRASLAZ. GRUPPO AVVIO CICLO
LIBERO
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INPUT SECTION
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Alterations :
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OF 3
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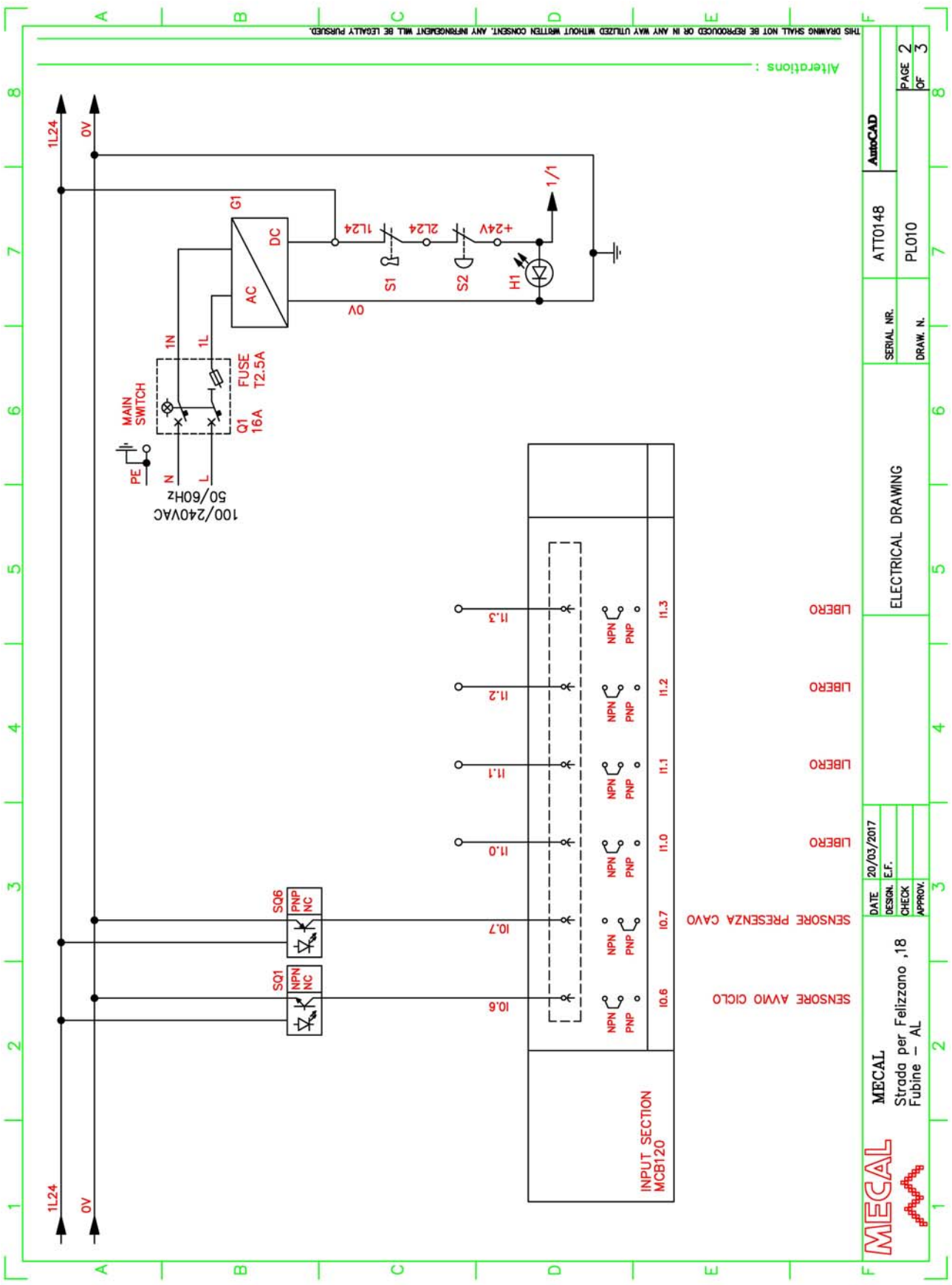
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H1
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1L
FUSE
T2.5A
Q1
16A
MAIN
SWITCH
PE
N
L
100/240VAC
50/60Hz
LIBERO
I1.3
I1.2
I1.1
I1.0
NPN
PNP
I1.3
I1.2
I1.1
I1.0
I0.7
I0.6
SENSORE PRESENZA CAVO
SENSORE AVVIO CICLO
SQ6
PNP
NC
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DATE
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OUTPUT SECTION MCB120
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Q08
Q0.1
Q0.2
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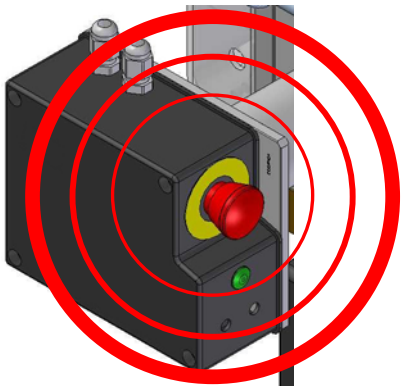
Q0.4
Q0.5
Q0.6
Q0.7
Q1.0
Q1.1
Q1.2
Q1.3
PINZA BLOCCAGGIO CAVO
TRASLAZIONE GRUPPO
SENSORE AVVIO CICLO
GRUPPO SLITTA
ASPORTAZIONE ALLUMINIO
CHIUSURA PINZA
ASPORTAZIONE ALLUMINIO
CHIUSURA LAME
ASPORTAZIONE ALLUMINIO
ROTAZIONE PER
ASPORTAZIONE ALLUMINIO
ESTRATTORE
SCARICO RAPIDO ARIA
IMPIANTO PNEUMATICO
LIBERO
LIBERO
LIBERO
LIBERO
LIBERO
EV1
EV2
EV3
EV4
EV5
EV6
EV7
EV8

4) Start-up and use

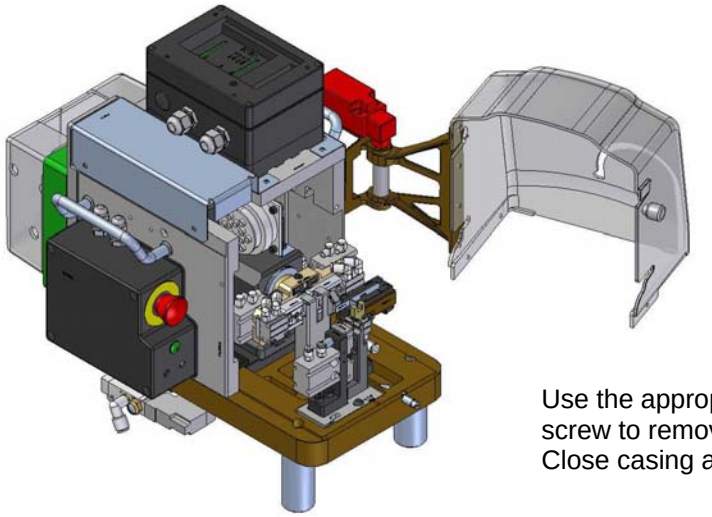
Pay due attention when manoeuvring for equipment installation/removal and calibration so as not to damage any part of the machine.

- Make sure that the green warning light is on.
- Make sure that the safety guard is properly positioned and secured in place.
  Note: the safety guard has been designed to prevent equipment operation unless it is correctly positioned.
- Make sure that the emergency switch is disconnected.
- Check pneumatic power (6 Bar).
- Select the desired program on the touch-screen.
- To start the cycle, read chapter 8.

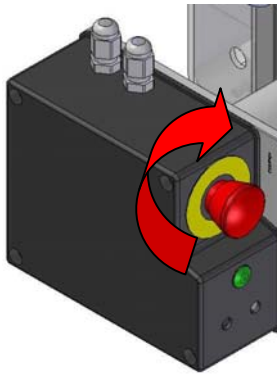


4.1) Stop and reset

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



Use the appropriate key to open the fixed guard. Use the captive screw to remove components that caused jamming.
Close casing again and screw in the captive screw.

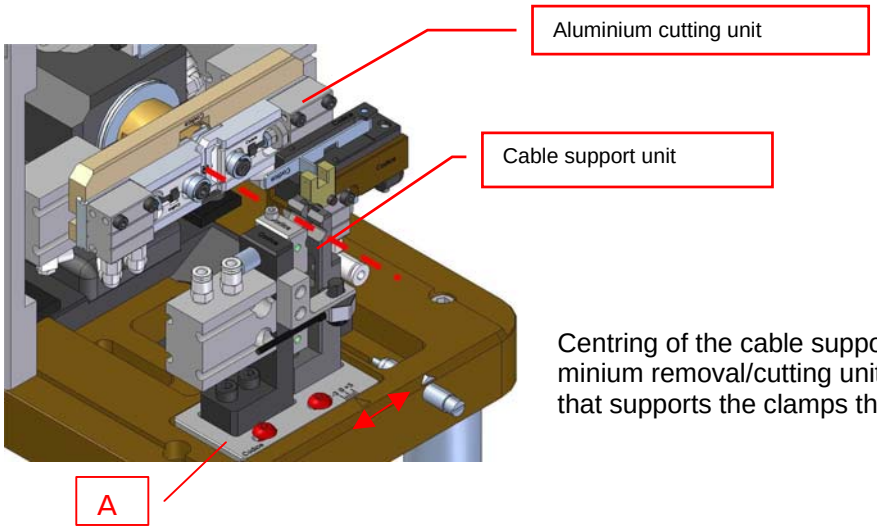


Release the button, turning it in the clockwise direction until you hear a release "click" to restore the emergency. Equipment will automatically reset.

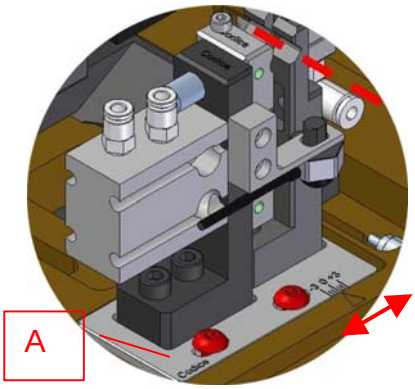
5) Process adjustments

CAUTION: all adjustment operations must be carried out with the machine in emergency conditions or switched off and the air inlet closed (see chapter 2.5).

5.1) Centring the cable locking unit

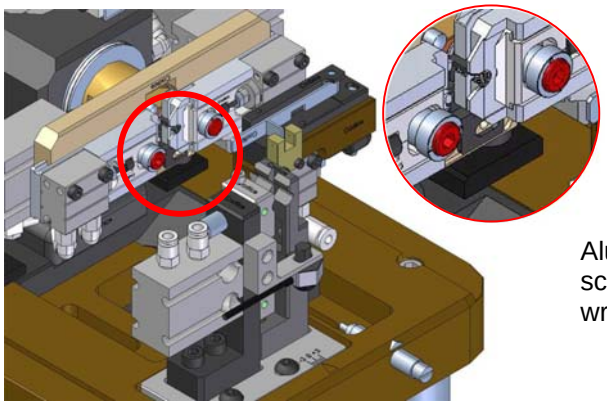


Centring of the cable support clamps with respect to the aluminium removal/cutting unit is carried out by moving the block that supports the clamps themselves.



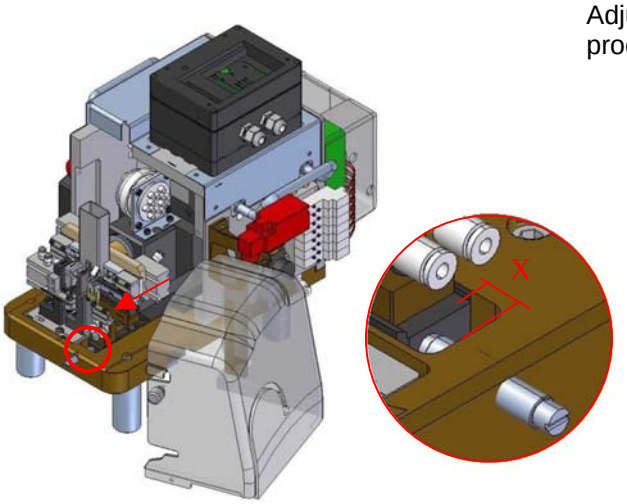
Loosen the fixing screws and move block "A" along the graduated scale, making sure that the clamps are aligned with the cutting unit. Re-tighten the screws.

5.2) Depth of aluminium foil cutting



Aluminium cutting depth is adjusted by means of the two screws on the eccentric. Loosen to righten using a CH3 wrench to find the desired position.

5.3 Adjusting the aluminium foil cutting position



Fine adjustment of the table is carried out by means of the decelerator using a 12 size wrench and a screwdriver.
Adjust value X according to the needs of the connector to be processed.

5.4) Display operation

The Home Screen is divided into two parts: the upper one is NOT selectable.
There are 4 selectable menus at the bottom:

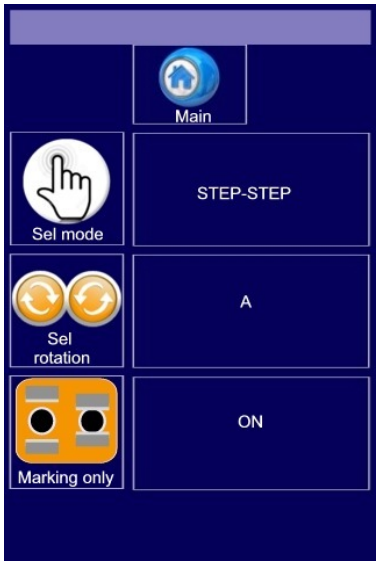
- Language
- Information
- Mode (pg. 25
- Settings (pg. 25)

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

The command  brings you back to the main screen.

Info Screen  is divided into 3 sections:
- Counter: is not resettable and provides the total number of machine cycles.
- Reset: 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 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 3 menu:

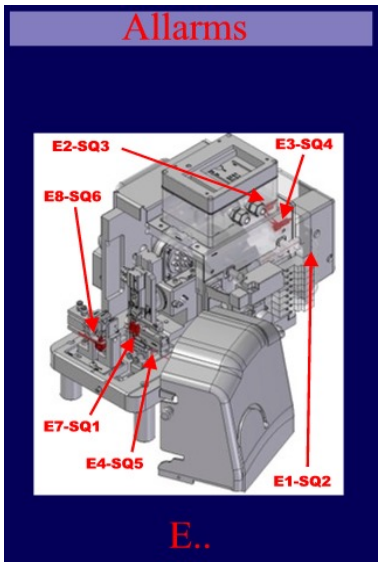
- Sel mode pressing the icon  , it is possible to select AUTO (automatic) or STEP by STEP cycle function.
- Sel rotation press the icon 

to select the side of the cable to be processed and rotation will thereby occur in the clockwise (A) or counter-clockwise (B) direction. Select function A/B and the program will prepare to first process side A of the cable and then side B.
- Marking only press the icon 

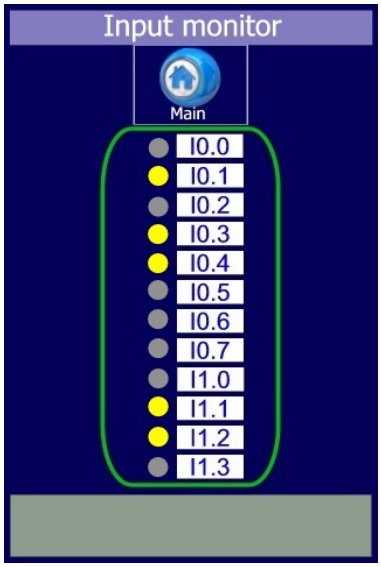
to active the possibility to cut the aluminium film without removing it (ON) or to cut it and remove it automatically (OFF)

Select the icon  to activate or deactivate the buzzer to signal:

- Machine on
- Errors on sensors
- Errors detected by the fibre optics



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 (see chapt. 10).



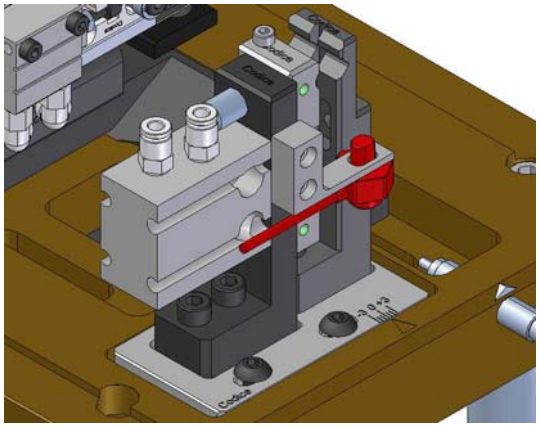
Sensors Screen is activated by pressing two times consecutively on the lower-right part of the Home screen. This screen allows you to view the active sensors (highlighted in yellow), or disable (marked in gray) and is an aid during sensor adjustment phases.

CAUTION: the screen can only be activated during the AUTO phase of the work process, in STEP by STEP mode, you can not activate it.

6) Maintenance adjustments

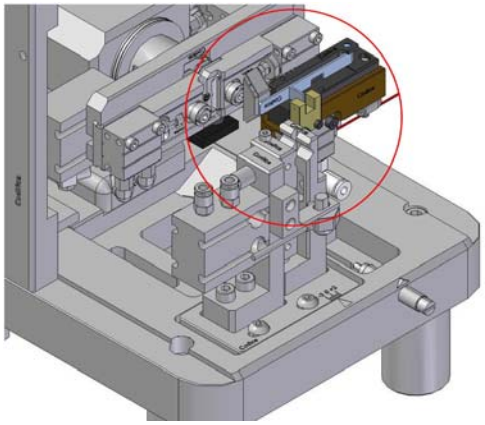
CAUTION: all adjustment operations must be carried out with the machine in emergency conditions or switched off and the air inlet closed
The adjustments described below are only to be applied for special maintenance.

6.1) Cable presence sensor_SQ1

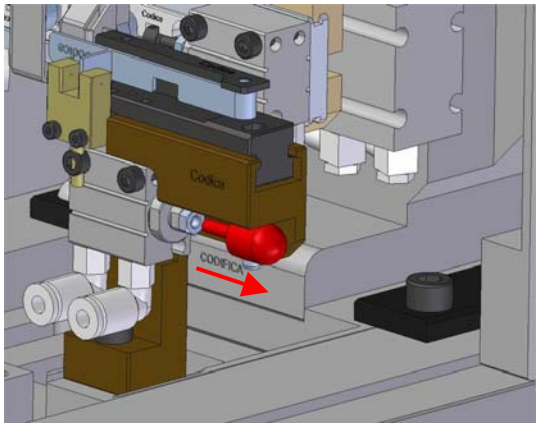


Follow the Sunx attachment for sensor adjustment.

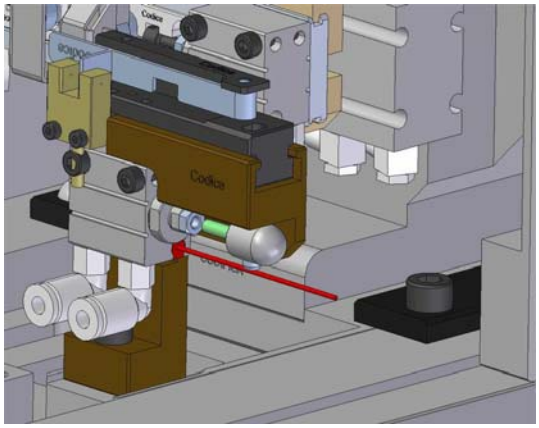
6.2) Sensor lever cylinder position_CP2 - SQ5



Put slight pressure with the cable on the sensor lever. The working cycle will proceed moving its support unit to the left, freeing the working area. Its correct position is controlled by a sensor, which must be adjusted only when necessary (sensor replacement, maintenance, etc.).

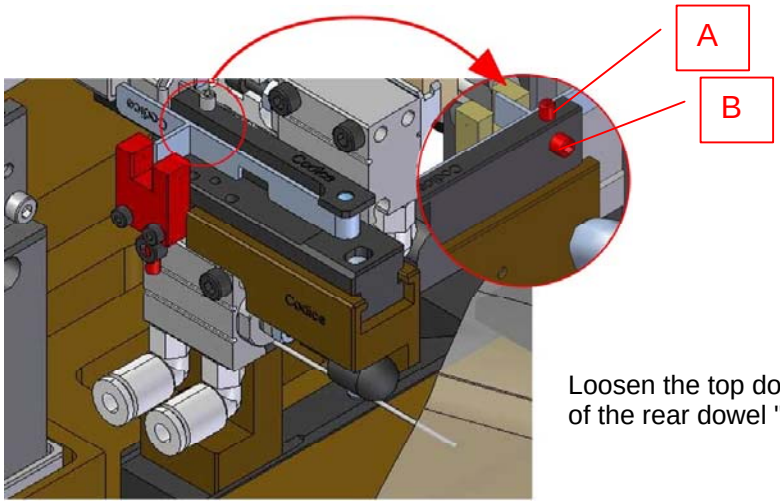


Unscrew and bring the CP2 cylinder shaft to end stop (maximum opening).

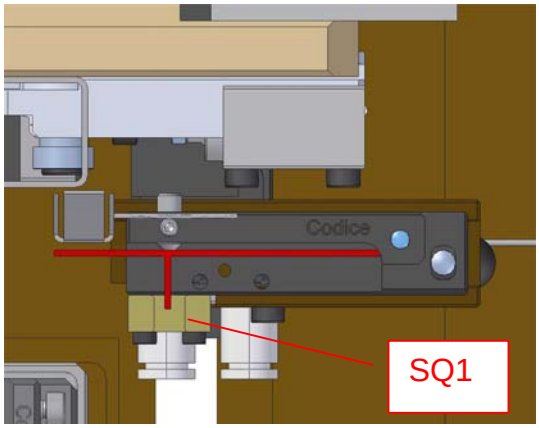


Insert sensor SQ5 and secure it after the cylinder has been recognised (red light on).

6.3) Forked sensor for sensor lever_ SQ1

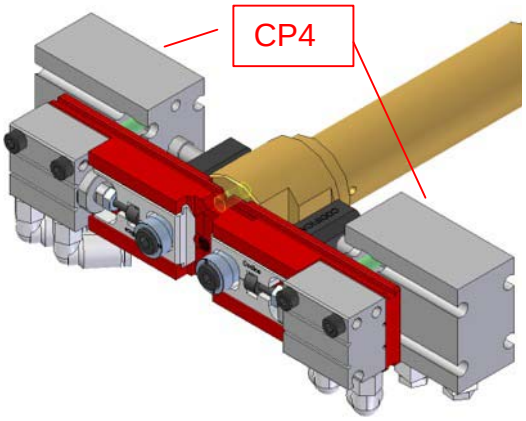


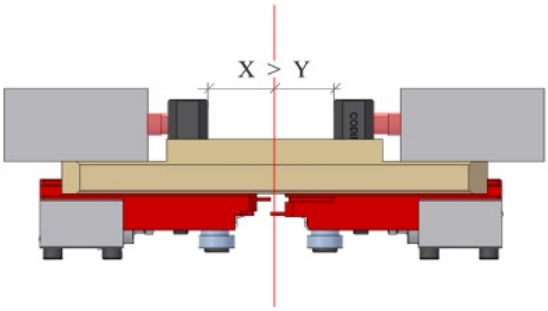
Loosen the top dowel "A" and screw in the entire threading of the rear dowel "B".



Manually move the sensor lever to end stop with rear dowel "B" and tighten the latter until the red SQ1 sensor LED switches on.
Re-tighten dowel "A".

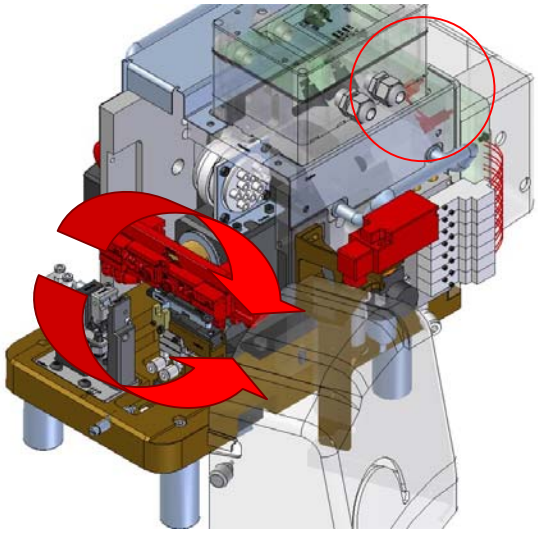
6.4) Clamp adjustment_CP4

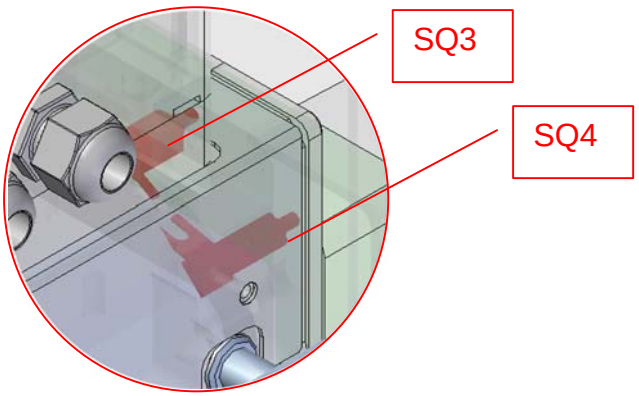




Clamp position is adjusted by means of the stroke length of the respective "CP4" cylinder rods. The right clamp "Y" MUST run a smaller stroke with respect to the left clamp "X".

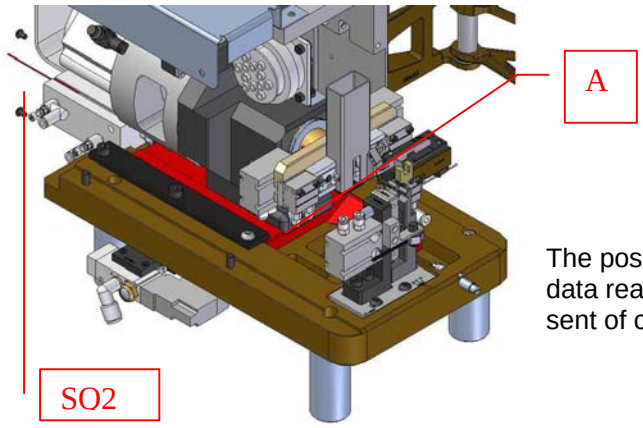
6.5) Rotating cylinder_SQ3 SQ4



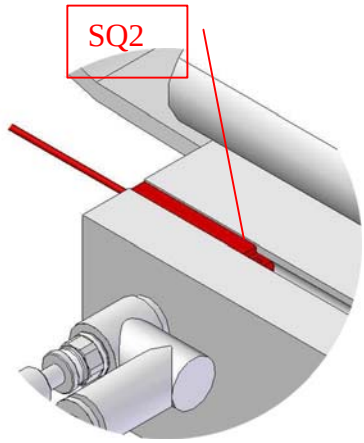


Aluminium cutting occurs by means of cutting unit rotation. This rotation is carried out by means of a rotating cylinder which performs a 270° rotation. The start and end of each rotation is detected by two sensors located on the cylinder.
Adjust the sensors by rotating the aluminium cutting unit in the counter-clockwise direction until the cylinder end stop is reached, and move sensor "SQ3" until it detects that the LED on the sensor has switched on. Repeat this same operation, turning the unit in the clockwise direction and moving sensor "SQ4".

6.6) Table protection sensor_CP3 – SQ2



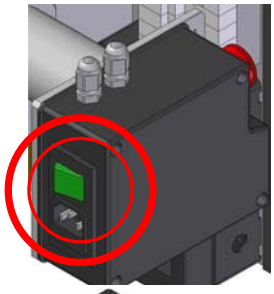
The position of table "A" is controlled by sensor "SQ2". The data read by the sensor allows you to give or withhold consent of cycle start.



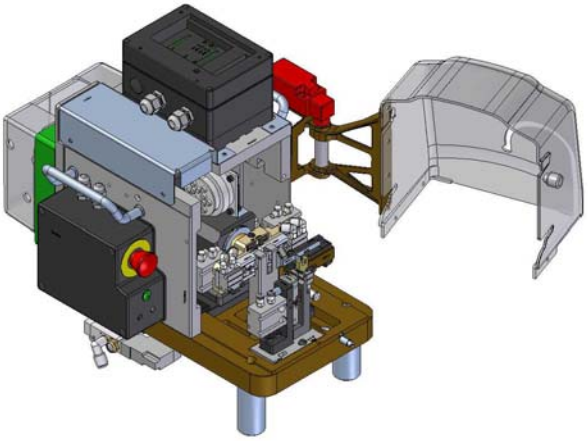
Sensor adjustment is carried out moving the table toward the rear of the machine. Insert the sensor in the "CP3" cylinder until red LED ignition is detected and fasten it. The sensor will read the position of the cylinder in stand-by and, as a result, the rearmost position of the table.

7) 90°-180° transformation

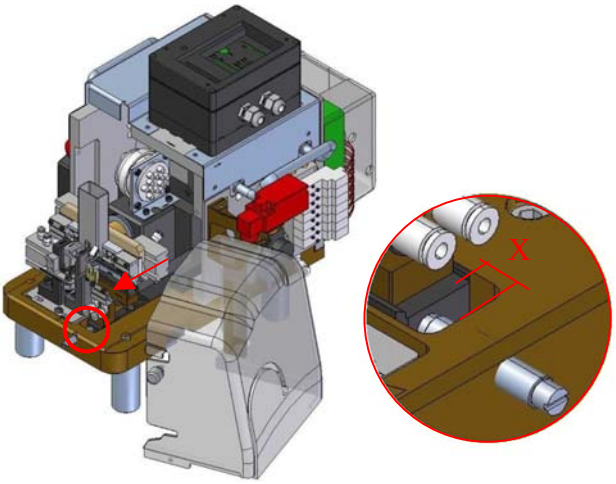
Press the emergency button.



Switch off the machine via the main switch located at the rear of the machine.

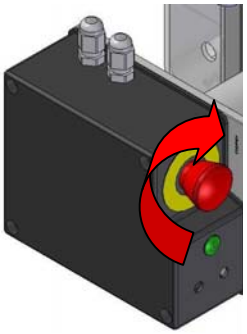


Open the casing with the captive screw.



Bring the stripping unit table up against the decelerator.
Adjust the decelerator with a 12 size wrench and a screwdriver.
Adjust value X according to the needs of the connector to be processed.
Mecal suggests as value X:

90°_Right angle HSD=12.1 mm
180°_Straight angle HSD=14.5mm

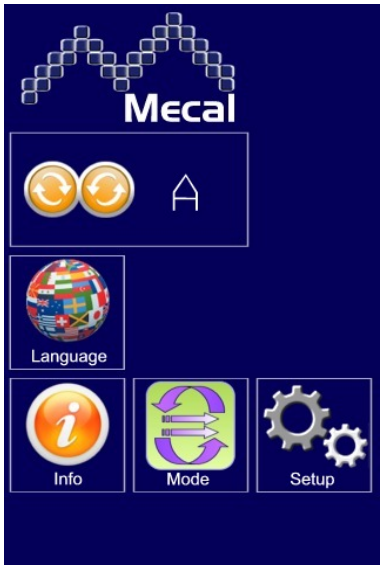


Close the casing.
Switch on the machine by pressing the main switch located at the rear. Restore the emergency, releasing the button and turning it in the clockwise direction until you hear a release "click."
Equipment will automatically reset

8) Working cycle

Make sure that equipment is on (see chapter 4).
Make sure that the machine is adjusted (see Chapter 5) and correctly arranged (see Chapter 6).

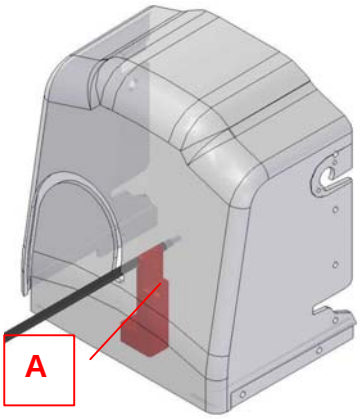
STEP 1. Display



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 batch (pg. 24)
- Select rotation and marking (pg. 25)
- Set buzzer (pg. 25

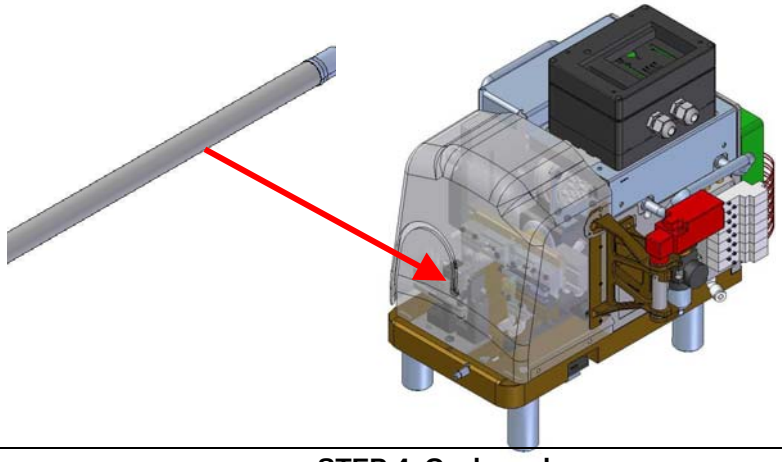
STEP 2. Cable insertion



Make sure that the sheath is folded back and the cable is straight.
Insert the cable in the casing slot in line with locking clamps.
Make use of the right clamp "A", using it as a sliding guide.

STEP 3. Cycle start-up

Push the cable forward, pressing on the sensor lever. The cycle will start.



STEP 4. Cycle end

Remove the cable at the end of the cycle.

9) Maintenance

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

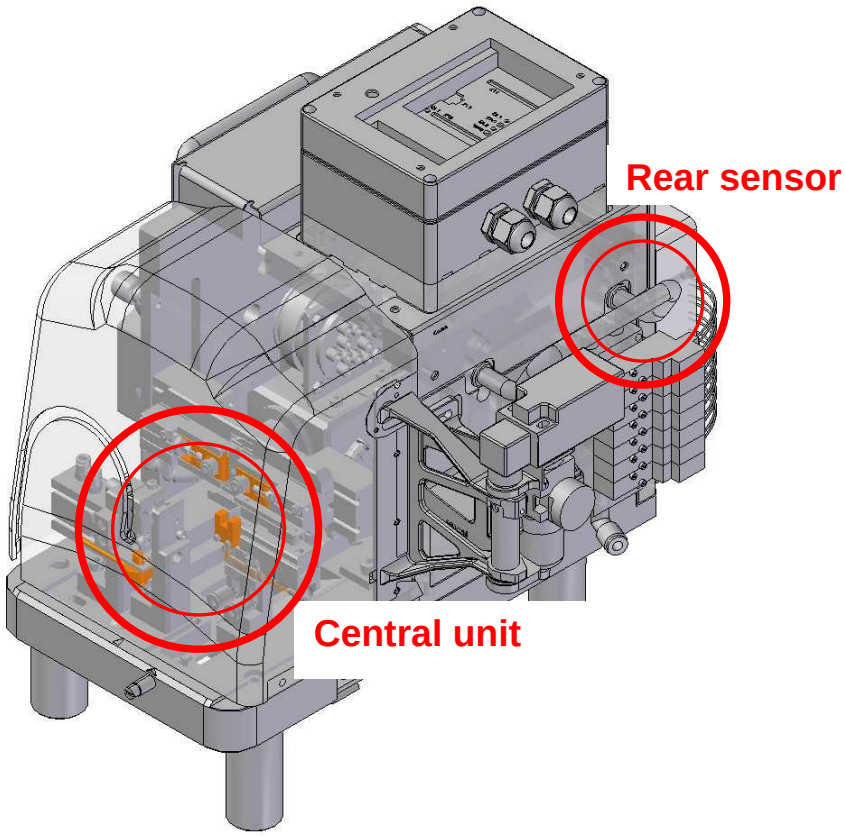
9.1) Spare parts

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.

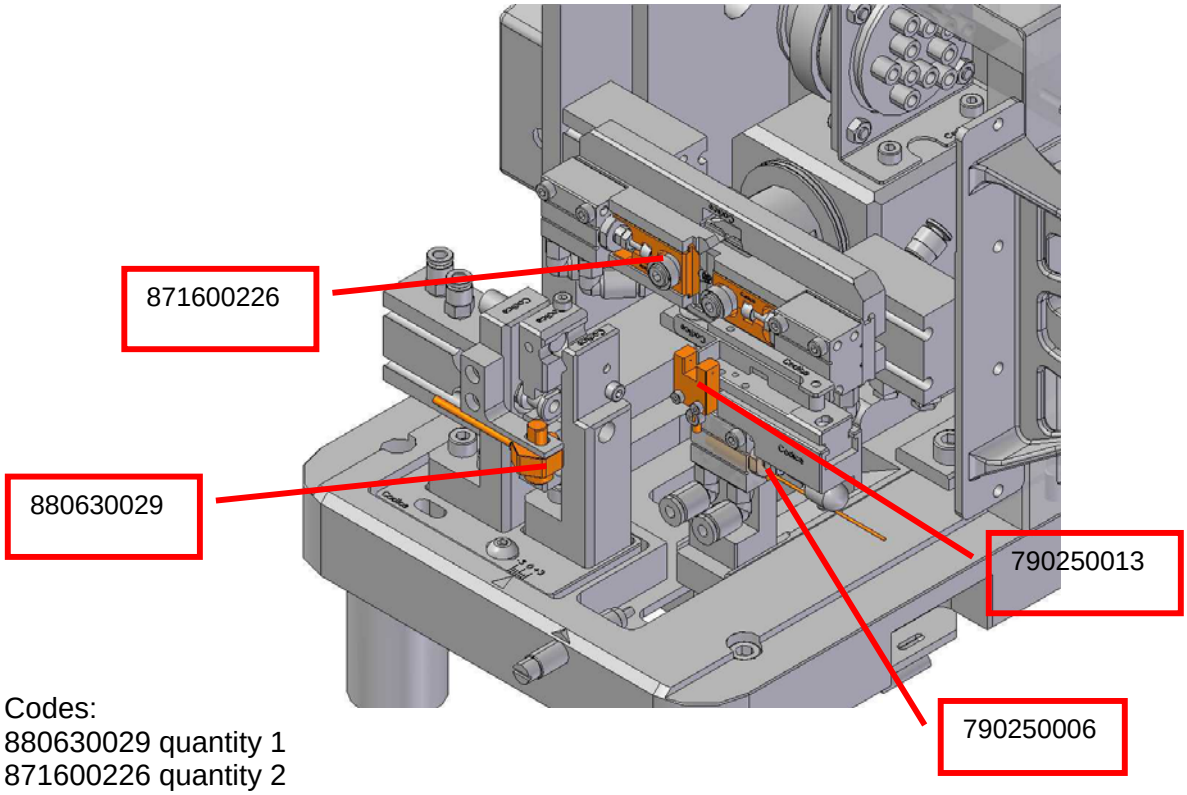
Download files in .pdf format via the "Documents" icon to access the BOM with part codes and reference to identification shown in the exploded diagram. Verify that the model and serial number correspond with the applicator in question.

9.2) Spare parts recommended by Mecal

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

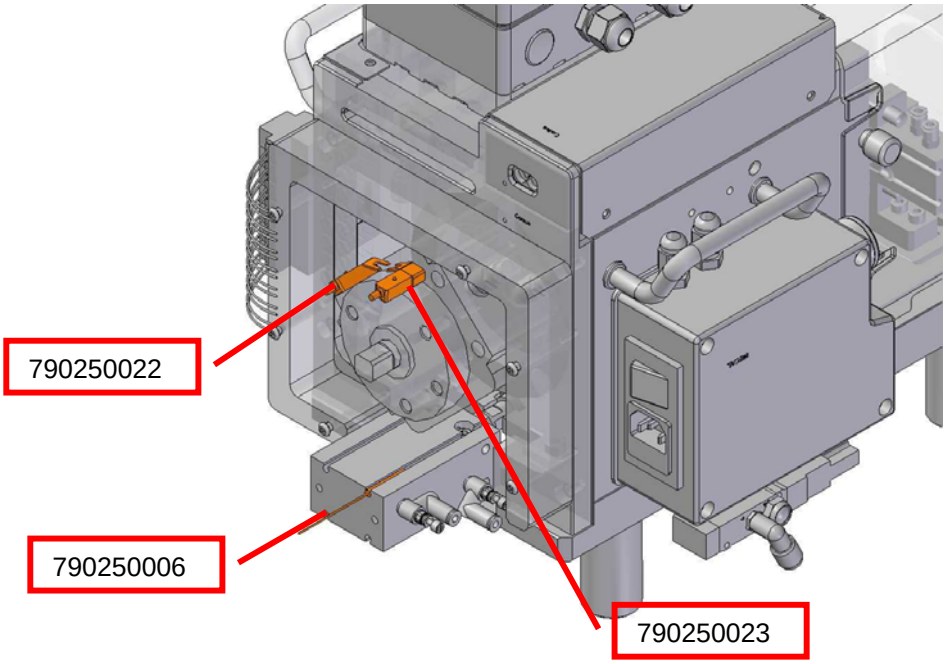


9.2.1) Central unit



Codes:
880630029 quantity 1
871600226 quantity 2
790250006 quantity 1
790250013 quantity 1

9.2.2) Rear sensors



Codes
790250006 quantity 1
790250023 quantity 1
790250022 quantity 1

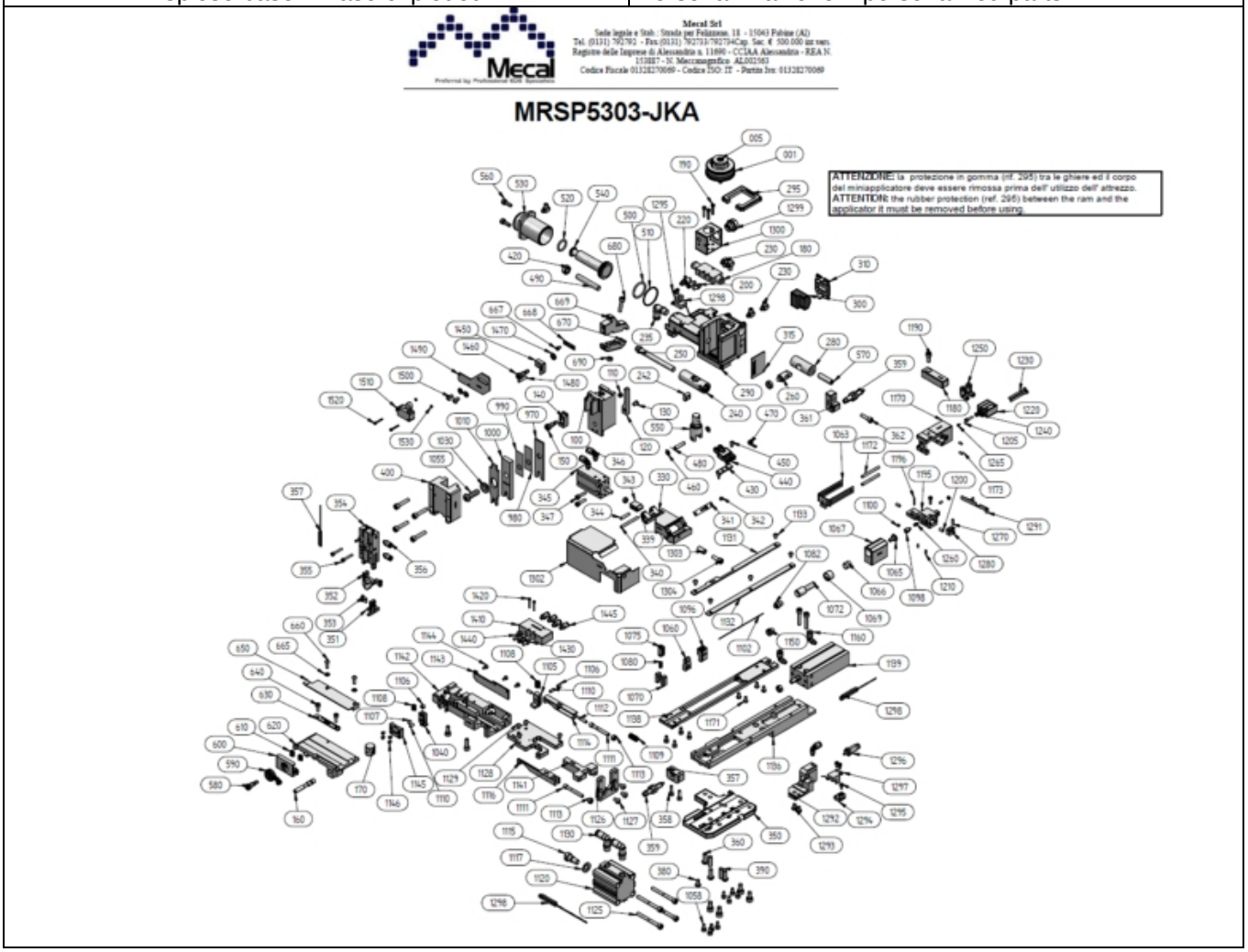
9.3 Example of documentation

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

The code of the part to be replaced/ ordered is identified with reference to the exploded diagram (Ref) matching the code.

Esploso 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 4 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 (pg.24) to best manage the wear and requirements of spare parts.

IMPORTANT: It is important to take note of or record the number of applicator cycles so that routine maintenance and replacement of spare parts are carried out correctly.

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) Troubleshooting and problem resolution

The cycle does not start:

- Verify that the air system is open and electrical connections are connected.
- Verify that the SQ6 sensor is clean, adjusted and properly connected.
- Verify that the sensor lever has been activated.
- Make sure that there are no scraps or impediments to sensor lever stroke.
- Make sure that the sensor lever has been correctly adjusted.
- The sensor lever unit may not be in the correct position. Make sure that there are no impediments compromising corresponding cylinder operation.
- The table may not be in the correct position. Check that there are no impediments to the table stroke, verify that sensor SQ2 is reading and is properly adjusted.
- Verify that the machine was reset the end of the previous cycle.
- Verify that the emergency button has been reset.

The clamps are not closing the cable:

- Sensor SQ6 is not reading cable presence because the cable has not been inserted correctly, the sensor is dirty, the sensor has not been adjusted correctly, or the sensor has not been secured correctly.
- The clamp cylinder is not locking the cable. Check that the cylinder sliding area is clean.
- The sensor lever has not been pressed correctly.
- Sensor SQ1 is not reading sensor lever movement. Check that the sensor is free of scraps and can read correctly, it has been adjusted and secured correctly, and make sure that it is not disconnected or that the cable is damaged.

Verify that the machine was reset the end of the previous cycle.

The aluminium cutting unit is not performing a 270° cycle:

- Sensors SQ3 and SQ4 are not reading the correct position of the rotating cylinder end stop. Adjust sensor positions.
- Make sure that there are no scraps impeding correct unit movement.

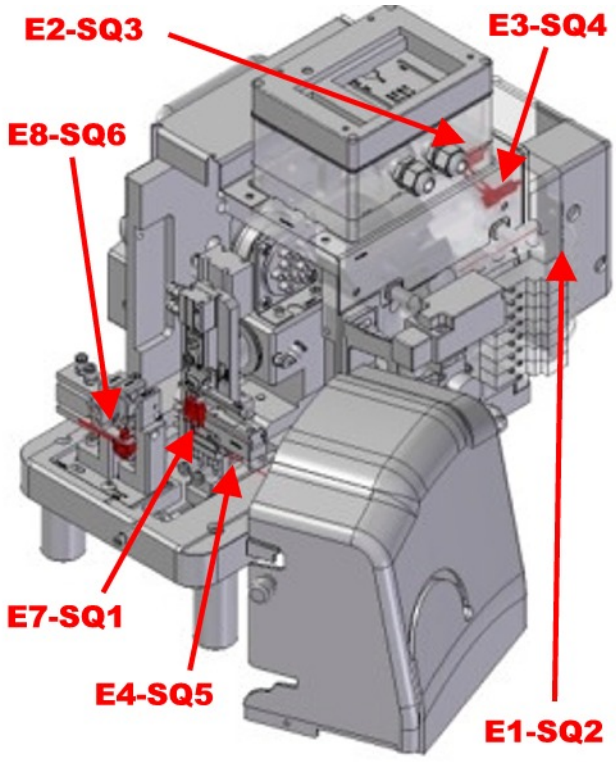
The machine is not reset at the end of the cycle:

- Sensor SQ2 is in error status; the table is not in the correct position. Check that there are no impediments to the table stroke, verify that the sensor is reading and is properly adjusted.
- The sensor lever unit is not in the correct position; the cylinder must be at end stop (maximum opening).
- The rotating cylinder is not able to restore the aluminium cutting unit position. Check sensors and for any impediments.

Sensor SQ6 detects cable presence. Remove the cable at the end of the cycle, verify that the sensor is clean and connected correctly.

ERROR CODE	SENSOR MESSAGE	MEANING	SOLUTIONS
E1	SQ2	Aluminium removal slide unit cylinder sensor	- 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.
E2	SQ3	Rotating cylinder sensor (counter-clockwise start)	- 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 sensors are not reading the correct position of the rotating cylinder end stop→ Adjust sensor positions. -The sensor may be burnt—> Replace the sensor.
E3	SQ4	Rotating cylinder sensor (clockwise start)	- 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 sensors are not reading the correct position of the rotating cylinder end stop→ Adjust sensor positions.
E4	SQ5	Cycle start-up unit transfer cylinder sensor	- 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.
E7	SQ1	Cycle start-up sensor	- 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.
E8	SQ6	Cable presence sensor	- 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 - Check that it is correctly adjusted (see manufacturer catalogue). - The sensor may be dirty→ Clean sensor.

11) Error signals



ERROR CODE	SENSOR MESSAGE	MEANING
E1	SQ2	Aluminium removal slide unit cylinder sensor
E2	SQ3	Rotating cylinder sensor (counter-clockwise start)
E3	SQ4	Rotating cylinder sensor (clockwise start)
E4	SQ5	Cycle start-up unit transfer cylinder sensor
E7	SQ1	Cycle start-up sensor
E8	SQ6	Cable presence sensor

Should an abnormality occur, make sure that the sensor 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

SUNX

INSTRUCTION MANUAL

New-form Beam Sensor **Amplifier Built-in**

EX-30 Series

Thank you very much for using SUNX sensors. Please read this Instruction Manual carefully and thoroughly for the correct and optimum use of this sensor. Kindly keep this manual in a convenient place for quick reference.

> ⚠ This product is not a safety sensor. Its use is not intended or designed to protect life and prevent body injury or property damage from dangerous parts of machinery. It is a normal object detection sensor.

1 SPECIFICATIONS

Item \ Type		Thru-beam type		Diffuse reflective type	
Model No.	NPN output	EX-31A	EX-31B	EX-32A	EX-32B
	PNP output	EX-31A-PN	EX-31B-PN	EX-32A-PN	EX-32B-PN
Sensing range		500mm		50mm (Note)	
Sensing object		ø2mm or more opaque object		Opaque, translucent or transparent object	
Hysteresis		———		15% or less of operation distance	
Repeatability (perpendicular to sensing axis)		0.05mm or less		0.5mm or less	
Supply voltage		12 to 24V DC±10%		Ripple P-P 10% or less	
Current consumption		Emitter: 10mA or less Receiver: 15mA or less		20mA or less	
Output		〈NPN output type〉 NPN open-collector transistor • Maximum sink current: 50mA • Applied voltage: 30V DC or less (between output and 0V) • Residual voltage: 1V or less (at 50mA sink current) 0.4V or less (at 16mA sink current) 〈PNP output type〉 PNP open-collector transistor • Maximum source current: 50mA • Applied voltage: 30V DC or less (between output and +V) • Residual voltage: 1V or less (at 50mA source current) 0.4V or less (at 16mA source current)			
Output operation		Light ON	Dark ON	Light ON	Dark ON
Short-circuit protection		Incorporated (restored automatically)			
Response time		0.5ms or less			
Operation indicator		Orange LED (lights up when the output is ON) (incorporated on the receiver for thru-beam type)			
Stability indicator		Green LED (lights up under stable light received condition or stable dark condition, incorporated on the receiver		Green LED (lights up under stable light received condition or stable dark condition	
Sensitivity adjuster		———		Continuously variable adjuster	
Protection		IP67 (IEC)			
Ambient temperature		–25 to +55°C (No dew condensation or icing allowed), Storage: –30 to +70°C			
Ambient humidity		35 to 85% RH, Storage: 35 to 85% RH			
Emitting element		Red LED (modulated)			
Material		Enclosure: Die-cast zinc Lens: Polycarbonate (EX-31□), Acrylic (EX-32□) Enclosure cover: Polycarbonate			
Cable		0.1mm² 3-core (thru-beam type sensor emitter: 2-core) cabtyre cable, 2m long			
Weight		Emitter/Receiver: 20g approx.		20g approx.	
Accessories		Nut: 2 Nos. Toothed washer: 2 Nos.		Nut: 1 No. Toothed washer: 1 No.	

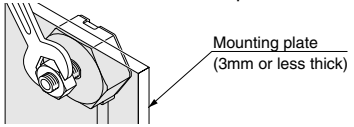
Note: The sensing range is specified for white non-glossy paper (100 × 100mm) as the object.

2 CAUTIONS

- Make sure to carry out the wiring in the power supply off condition.
- Take care that wrong wiring will damage the sensor.
- Verify that the supply voltage variation is within the rating.
- If power is supplied from a commercial switching regulator, ensure that the frame ground (F.G.) terminal of the power supply is connected to an actual ground.
- In case noise generating equipment (switching regulator, inverter motor, etc.) is used in the vicinity of this product, connect the frame ground (F.G.) terminal of the equipment to an actual ground.
- Do not use during the initial transient time (50ms) after the power supply is switched on.
- Extension up to total 50m (thru-beam type: both emitter and receiver) is possible with 0.3mm², or more, cable.
  However, in order to reduce noise, make the wiring as short as possible.
- Make sure that stress is not applied directly to the sensor cable joint.
- Do not run the wires together with high-voltage lines or power lines or put them in the same raceway. This can cause malfunction due to induction.
- Take care that the sensor is not directly exposed to fluorescent light from a rapid-starter lamp or a high frequency lighting device, as it may affect the sensing performance.
- Avoid dust, dirt, and steam.
- Take care that the sensor does not come in direct contact with water, oil, grease, or organic solvents, such as, thinner, etc.
- Make sure to use an isolation transformer for the DC power supply. If an auto-transformer (single winding transformer) is used, this product or the power supply may get damaged.
- In case a surge is generated in the used power supply, connect a surge absorber to the supply and absorb the surge.
- In case of using the sensor at a place where static electricity is generated, use a metal mounting plate. Also, ensure to ground the mounting plate.

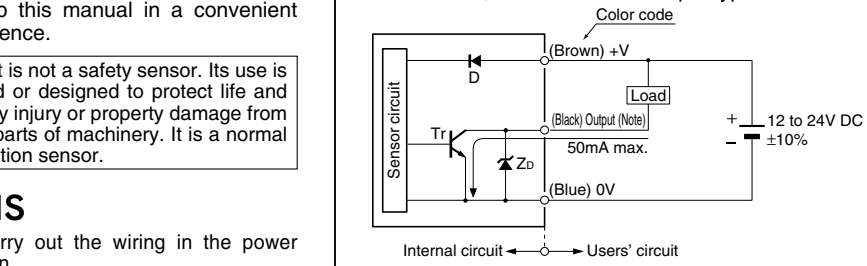
3 MOUNTING

- Mount the sensor on a mounting plate 3mm or less thick, using the enclosed nut and toothed washer. When tightening the nut, hold the sensor with hand or a spanner and make sure that the tightening torque is 0.6N·m (**EX-32**□: 1.0N·m) or less.
  Do not tighten the sensor itself with a spanner, etc.



4 I/O CIRCUIT DIAGRAMS

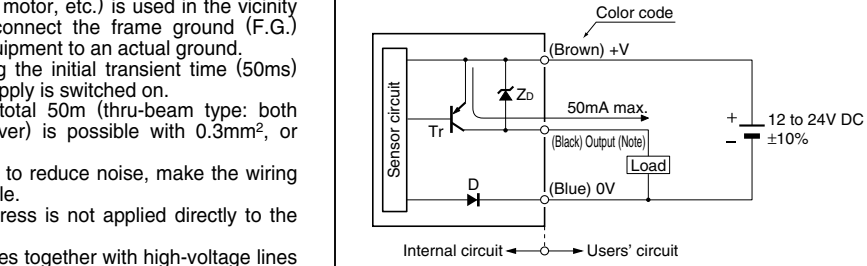
● **EX-31**□, **EX-32**□／NPN output type



Note: The emitter of the thru-beam type sensor does not incorporate the output.

Symbols... D : Reverse supply polarity protection diode
ZD: Surge absorption zener diode
Tr: NPN output transistor

● **EX-31**□**-PN**, **EX-32**□**-PN**／PNP output type

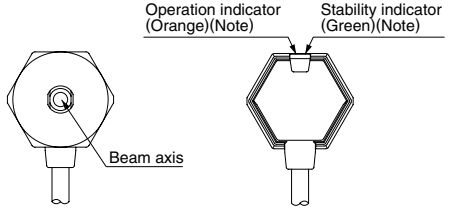


Note: The emitter of the thru-beam type sensor does not incorporate the output.

Symbols... D : Reverse supply polarity protection diode
ZD: Surge absorption zener diode
Tr: PNP output transistor

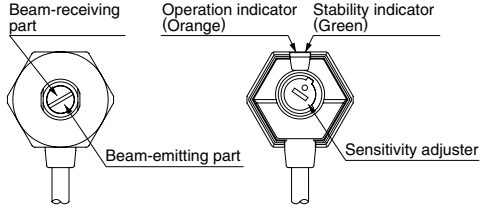
5 PART DESCRIPTION

● **EX-31**□, **EX-31**□**-PN**

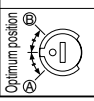


Note: Not incorporated on the emitter.

● **EX-32**□, **EX-32**□**-PN**



6 SENSITIVITY ADJUSTMENT (Diffuse reflective type only)

Step	Sensitivity adjuster	Description
①		Turn the sensitivity adjuster fully counterclockwise to the minimum sensitivity position.
②		In the light received condition, turn the sensitivity adjuster slowly clockwise and confirm the point Ⓐ where the sensor enters the 'Light' state operation.
③		In the dark condition, turn the sensitivity adjuster further clockwise until the sensor enters the 'Light' state operation and then bring it back to confirm point Ⓑ where the sensor just returns to the 'Dark' state operation. (If the sensor does not enter the 'Light' state operation even when the sensitivity adjuster is turned fully clockwise, this extreme position is point Ⓑ.)
④		The position at the middle of points Ⓐ and Ⓑ is the optimum sensing position.

Note: Turn the sensitivity adjuster slowly. Turning with excessive strength will damage the adjuster.

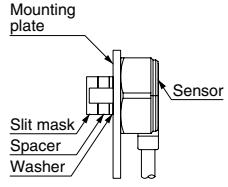
7 OPTIONAL SLIT MASK (Thru-beam type only)

- Apply the optional slit mask (**OS-EX30-10**) when detecting small objects or for increasing the accuracy of sensing position.
  However, the sensing range is reduced when the slit mask is mounted.

Mounting method

① Insert the sensor into the mounting plate.
② Fit the washer and spacers enclosed with the slit mask. Note that the number of spacers to be fitted differs with the mounting plate thickness, as given in the table on the right.
③ Mount the slit mask. Make sure that the tightening torque is 0.6N·m or less.

Mounting plate thickness	No. of spacers
3mm	0 No.
2mm	1 No.
1mm	2 Nos.



SUNX Limited http://www.sunx.co.jp/

Head Office
2431-1 Ushiyama-cho, Kasugai-shi, Aichi, 486-0901, Japan
Phone: +81-(0)568-33-7211 FAX: +81-(0)568-33-2631

Overseas Sales Dept.
Phone: +81-(0)568-33-7861 FAX: +81-(0)568-33-8591

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