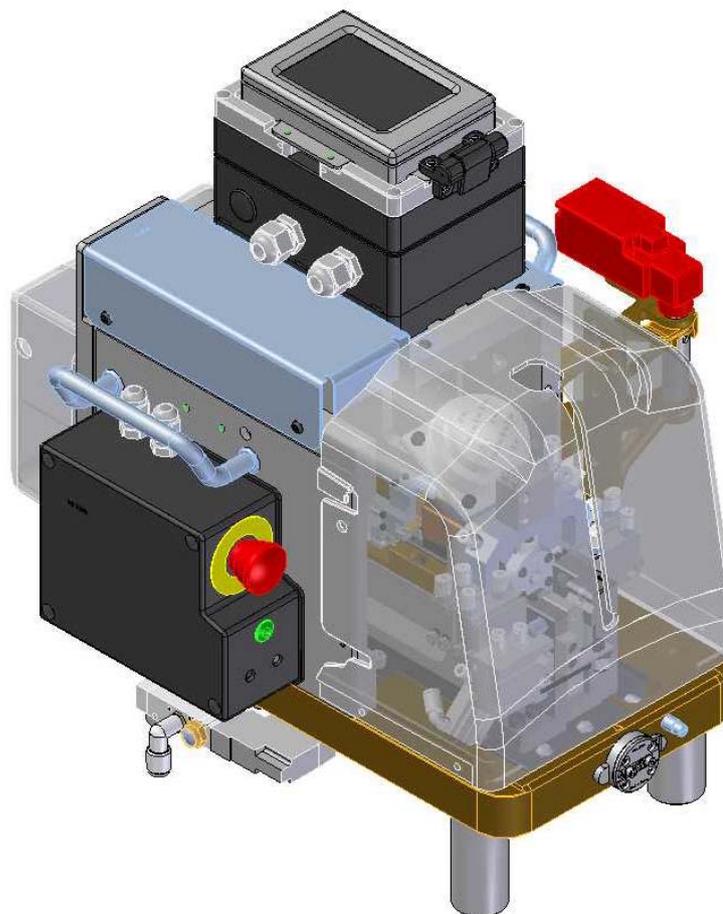


USE AND MAINTENANCE MANUAL 4_HSD STRIPPING STATION

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.





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These instructions were created in September 2016 and may be subject to change. MECAL 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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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 Stripping Station is one of the steps along the Mecal HSD (High Speed Data) cable production line. The equipment is designed to strip 4 conductors simultaneously without any bends or deformations. The process involves manual insertion of the cable in a housing that separates the conductors and directs them to the correct stripping positions. Each position is controlled individually by a sensor and the operating cycle starts only if all sensors are active simultaneously. The length of the stripping can be easily adjusted. Equipment is intended for use in industrial environments. The machine can only be used to simultaneously strip 4 HSD cable conductors. Its use for any application other than specified is **STRICTLY PROHIBITED**.

2.2) Technical information

HSD Stripping Station

ID	SC20
CODE	201000054
AIR PRESSURE	5-7 BAR
AIR CONSUMPTION	0.51 dm ³ /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	approximately 4 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:

-  Make sure that there is no damage to equipment 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



Equipment model

Application

Serial number

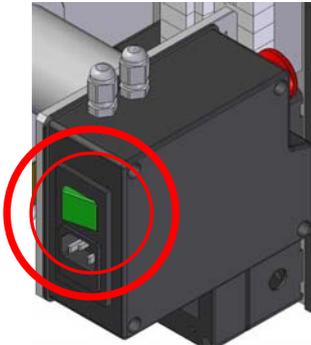
Year of production

Electrical power

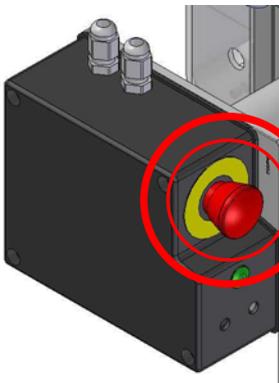
Pneumatic system pressure

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.

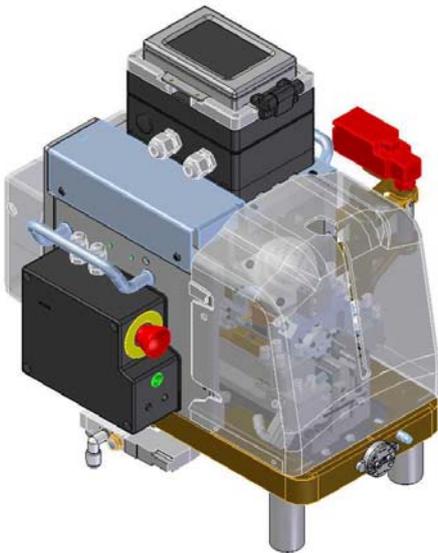


Announce operations on the line switch.

CAUTION! Read the following carefully:

- Equipment is provided with safety protections which, if removed, prevent operation.
- Do not attempt to use equipment without safety 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 cable for which it has been designed.
- No more than one operator can work on each piece of equipment.

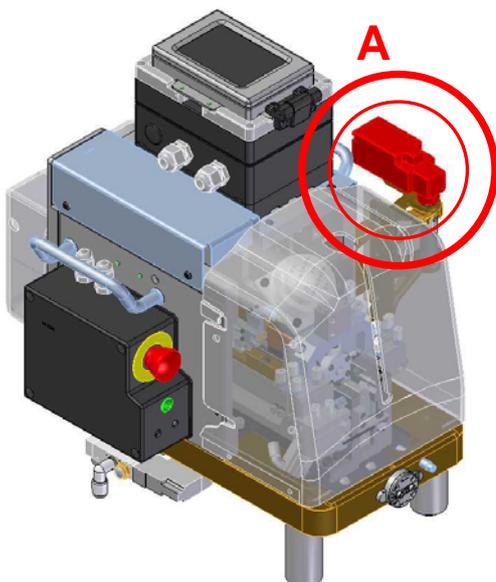
2.6) Protections



HSD Stripping Station equipment is equipped with a fixed guard that protects the working area during the machine cycle. The casing is in 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.

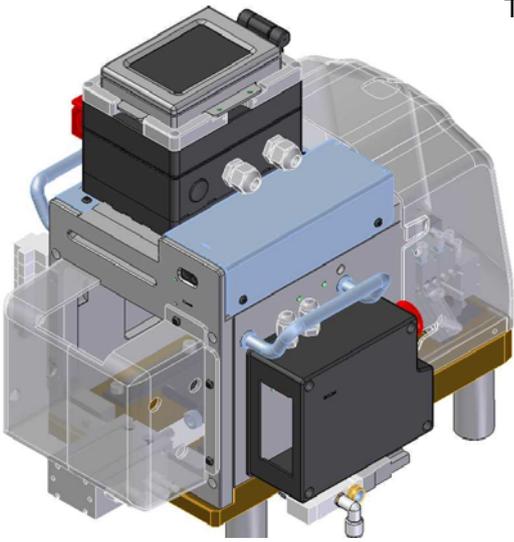


CAUTION: all maintenance operations must be carried out with the machine in emergency conditions or switched off. Electronically and pneumatically disconnect equipment.

Open the fixed casing, 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 or 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.
- 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 stripping 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) Electrical diagram

WIRING DIAGRAM

SC20

CLIENT : YAZAKI

MECAL S.r.l.

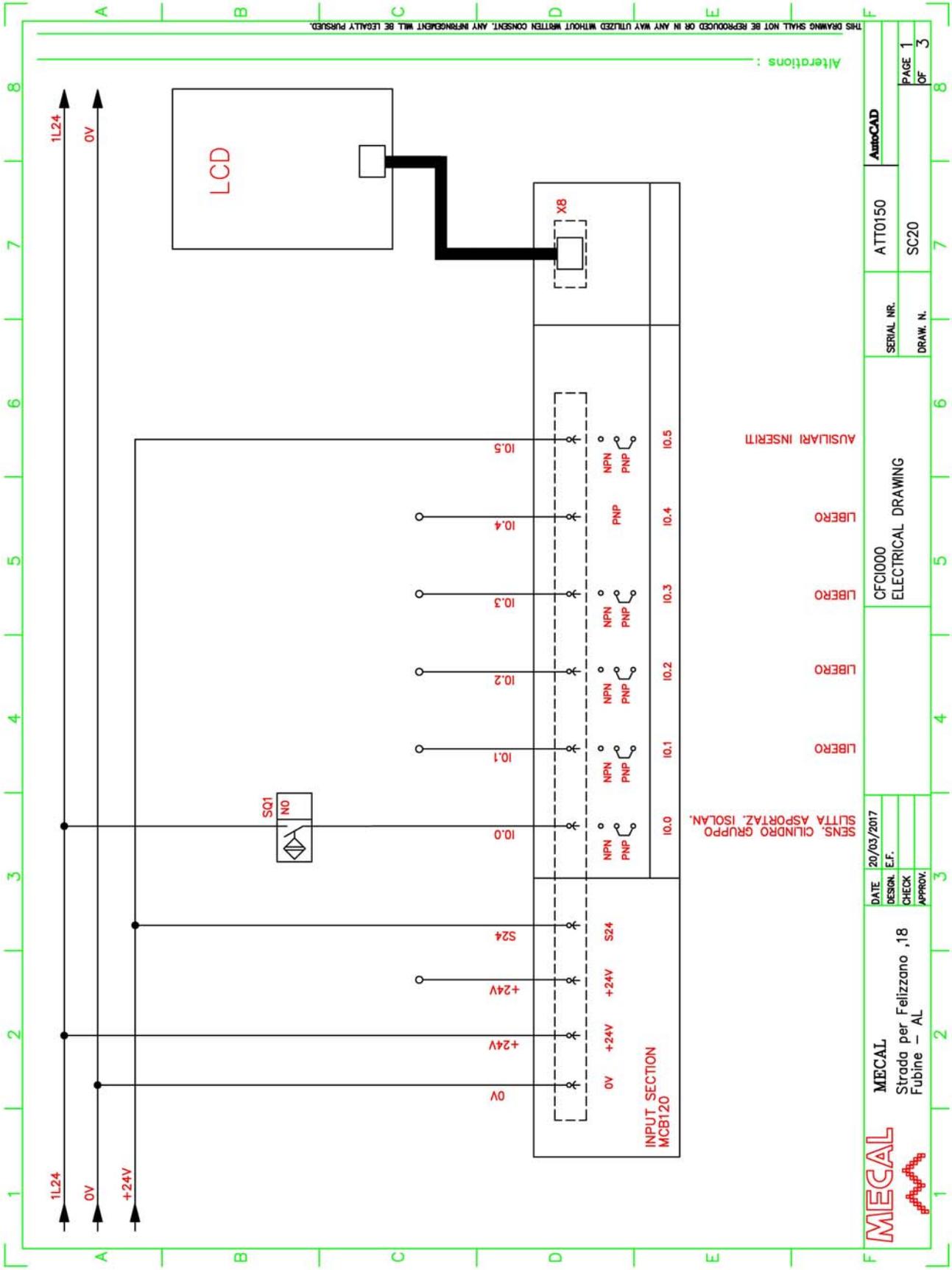
DRAW SC20

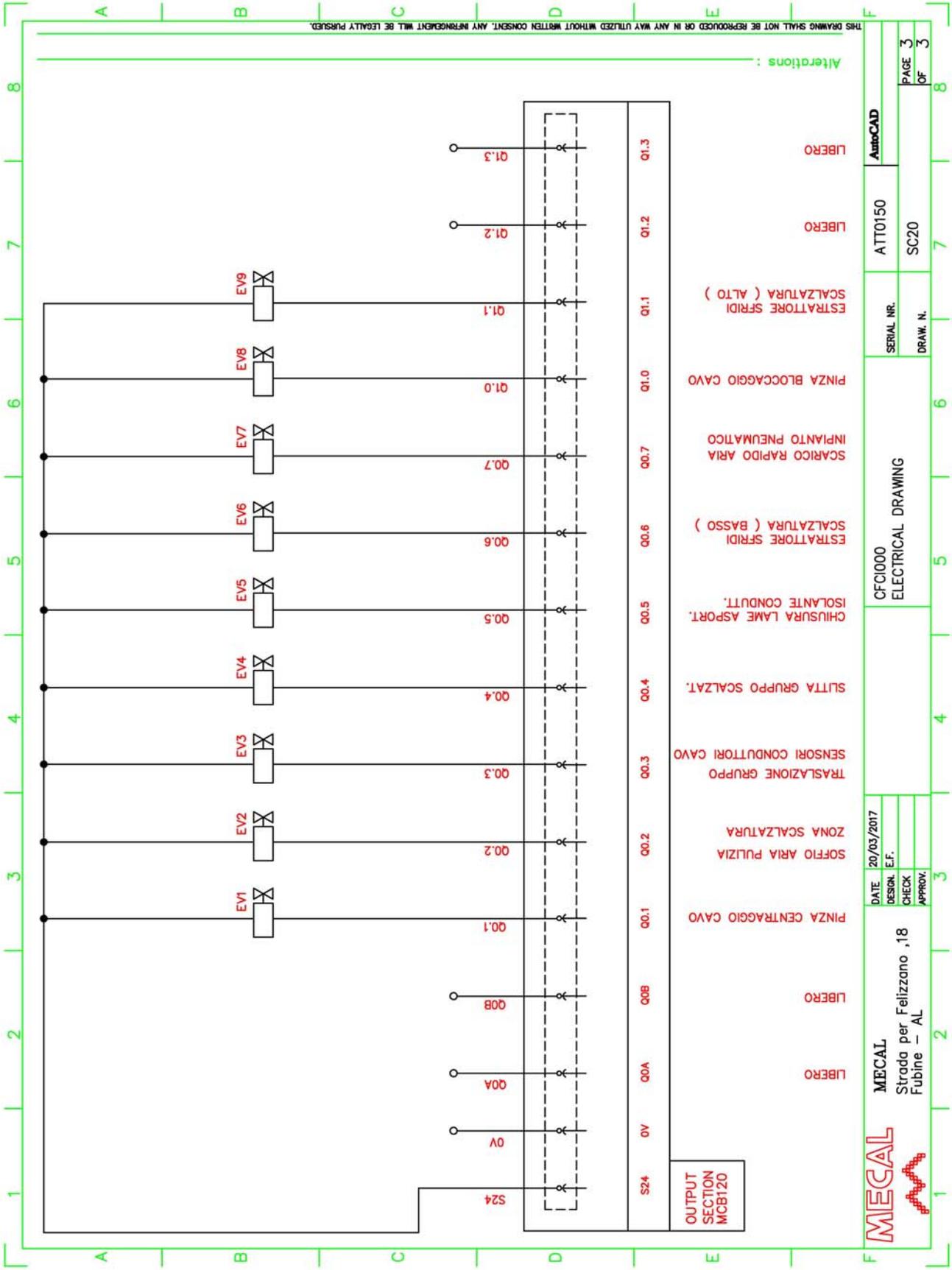
SERIAL NR. ATT0150

DATE 20/03/2017

MCB120 PROGRAM: MCP120ATR00

MECAL 





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.

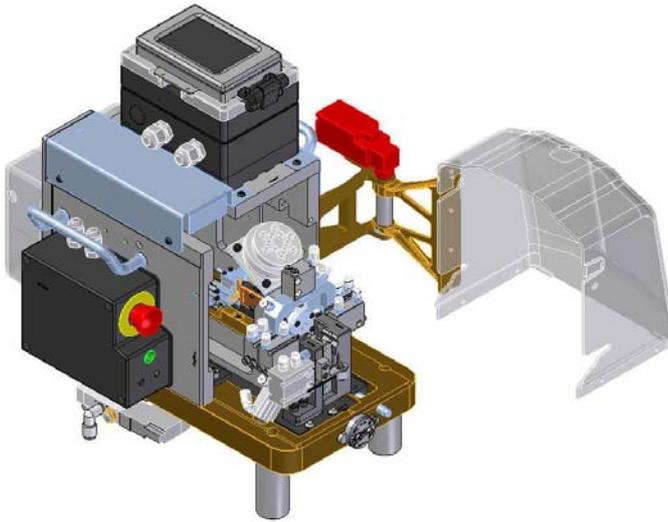
- Make sure that the green warning light is on.
- Make sure that the safety guard is properly positioned and secured in place.
Note: the safety guard has been designed to prevent equipment operation unless it is correctly positioned.
- Make sure that the emergency switch is disconnected.
- Check pneumatic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



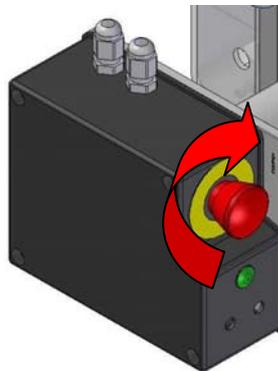
4.1) Stop and reset



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.

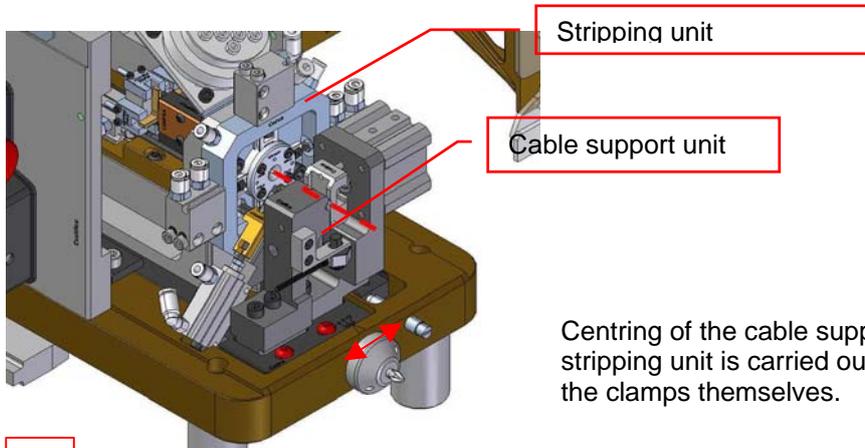


To restore the emergency, release the button, turning it in the clockwise direction until you hear a release "click." Equipment will automatically reset.

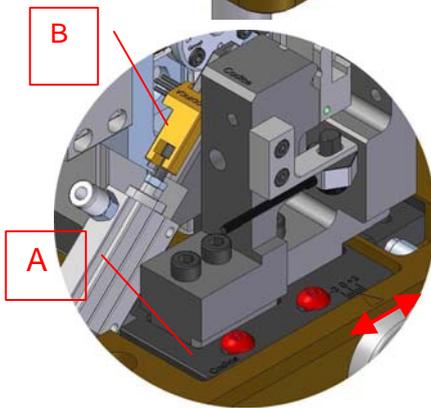
5) Process adjustments

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



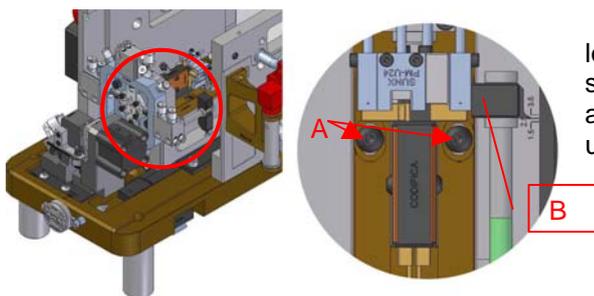
Centring of the cable support clamps with respect to the stripping unit is carried out by moving the block that supports the clamps themselves.



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

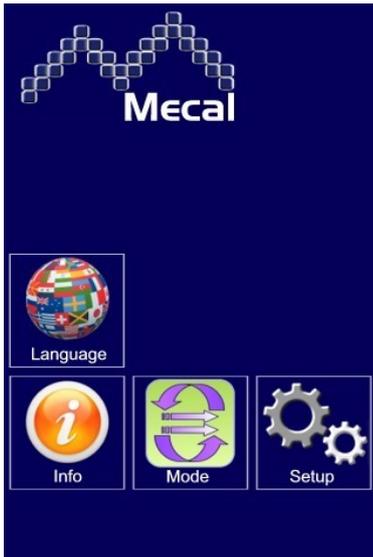
Caution: when adjusting the position of the clamps, make sure that the extractor for scrap cleaning "B" is centred with the cable insertion and stripping area.

5.2 Stripping position adjustment



Fine adjustment of the blade unit is carried out by slightly loosening the screws (A) on the carriage, located near the sensors, without removing them. Move the blade unit, adjusting the position of block "B" on the graduated scale using the dowel (use a size 3 wrench).

5.3 Display operation



The Home Screen is divided into two parts: the upper one, NOT selectable, specifies to the operator how cable colours that he has decided to crimp should be positioned.

There are 4 selectable menus at the bottom:

- Language
- Information
- Mode (pg. 24)
- Settings (pg. 24)



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 1 menu:

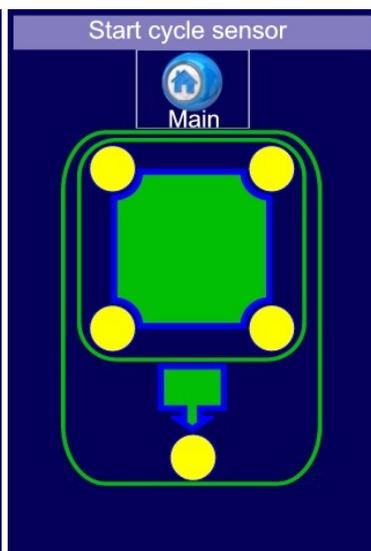
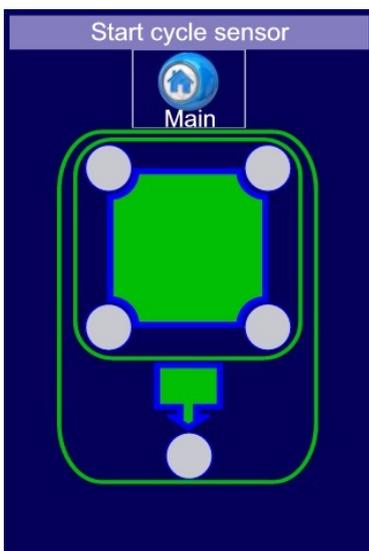
- Sel mode pressing the icon  , it is possible to select AUTO (automatic) or STEP by STEP cycle function.

The command  brings you back to the main screen.

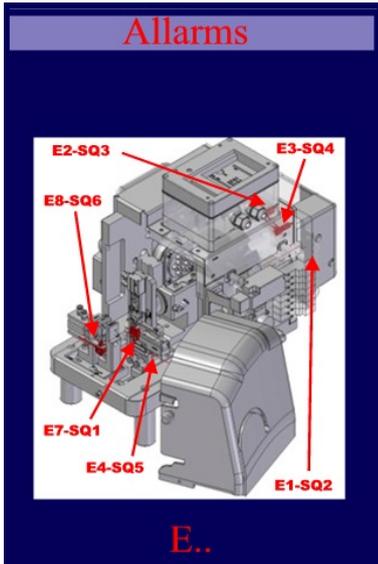


Select the icon  to activate or deactivate the buzzer to signal:

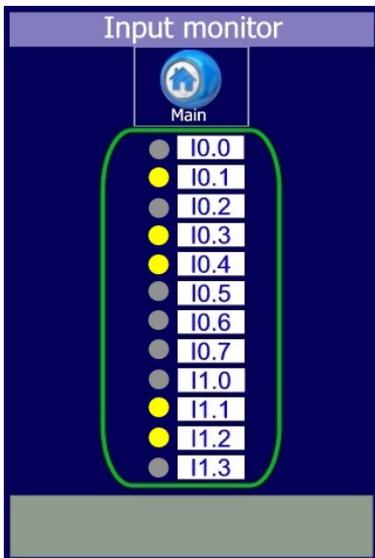
- Machine on
- Errors on sensors
- Errors detected by the fibre optics



The sensors screen appears as soon as the cable is inserted in the correct position inside the machine. The display indicates the sensors that are activated in yellow. The machine starts up a cycle when all 5 sensors are active (yellow).



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.



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.

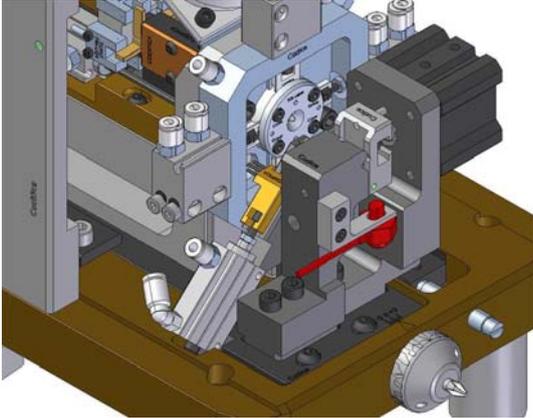
CAUTION: the screen can only be activated during the AUTO phase of the work process, in STEP by STEP mode, you can not activate it.

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 (see chapter 2.5).

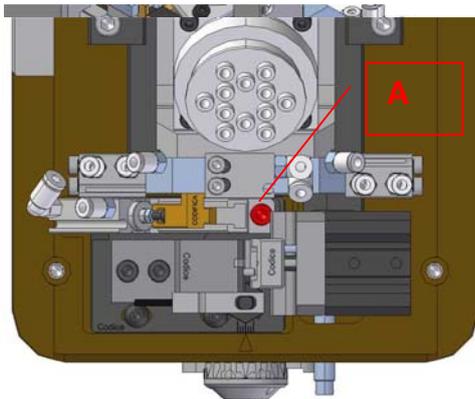
The adjustments described below are only to be applied for special maintenance.

6.1) Cable presence sensor_SQ6

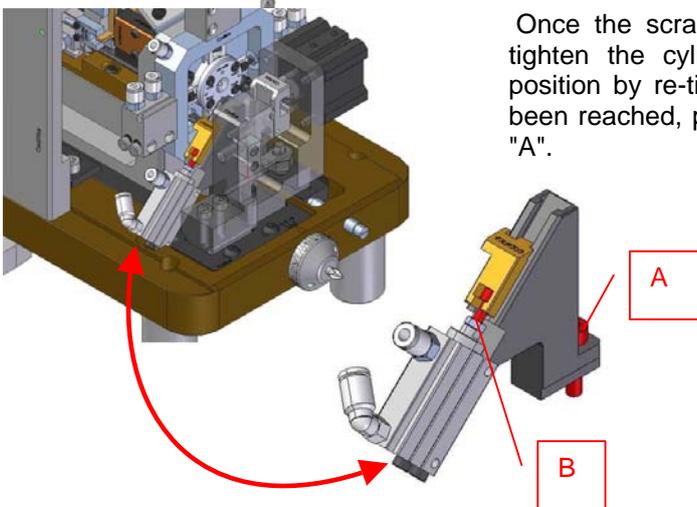


Follow the Sunx attachment for sensor adjustment.

6.2) Scrap cleaning extractor adjustment

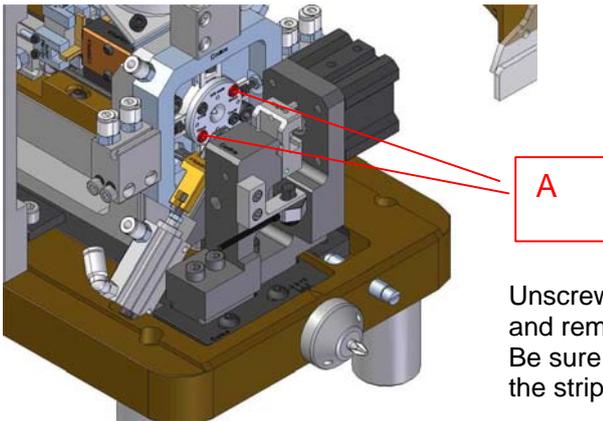


The position of the extractor can be adjusted by loosening screw "A" and moving the support in the desired direction. If a wider range of adjustment is necessary, loosen screw "A".

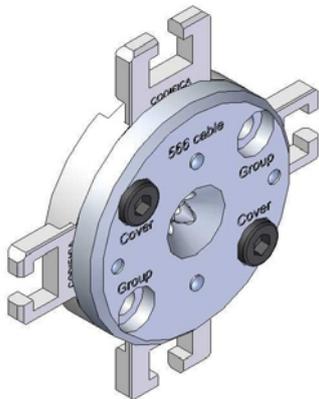


Once the scrap removal unit has been removed, unthread or tighten the cylinder "T" connection as needed and lock the position by re-tightening nut "B". Once the desired position has been reached, put the unit back in its place and re-tighten screw "A".

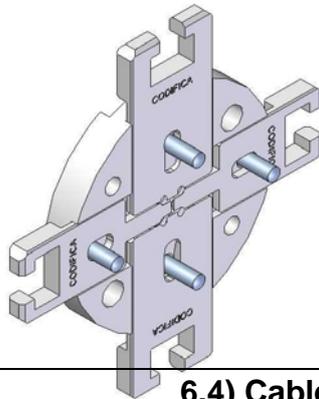
6.3) Stripping knife replacement



Unscrew fixing and polarization screws "A" on the stripping unit and remove the knife block.
Be sure to verify that the scrap cleaning extractor is not inserted in the stripping unit.



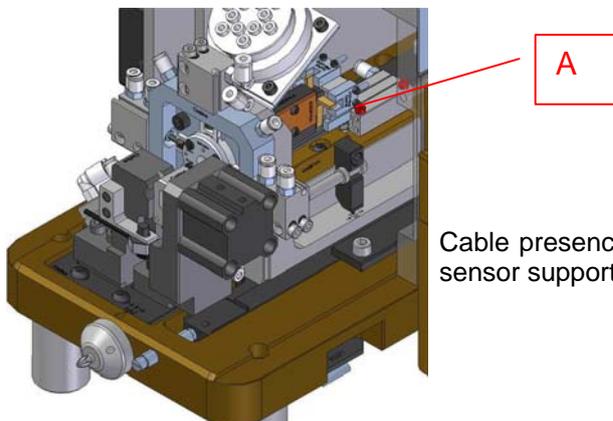
Unscrew the screws and remove the cover.



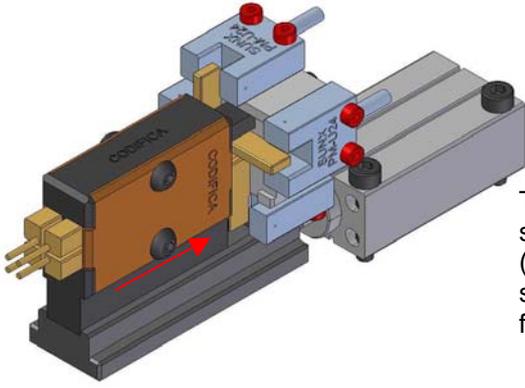
Replace knives. The housings present on the base guide insertion of the 4 knives.
Make sure that knives slide freely in their housings.

Fit the cover back on and fasten with screws.
Position the knife unit on equipment and tighten the fixing screws.

6.4) Cable presence sensors SQ2, SQ3, SQ4, SQ5

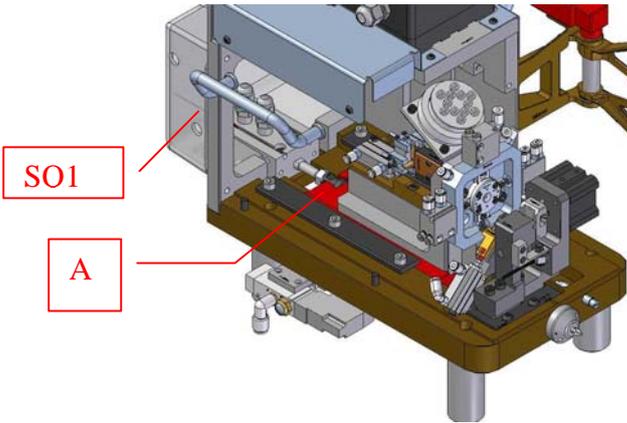


Cable presence sensor adjustment is carried out by removing the sensor support unit from the equipment. Unscrew screws "A".

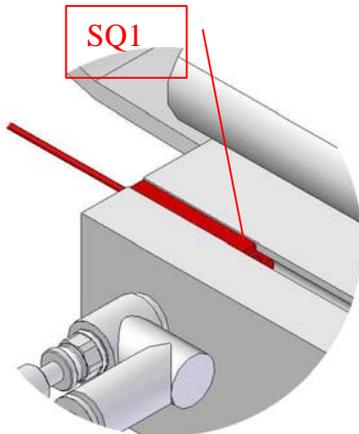


The four sensors have to be adjusted one at a time. Loosen the sensor locking screws, bring the sensor lever to end stop (rearmost position) and fasten the screws as soon as the red sensor LED switches on. Perform the same operation for the 4 forked sensors.

6.5) Table protection sensor_CP3 – SQ1



The position of table "A" is controlled by sensor "SQ1". The data read by the sensor allows you to give or withhold consent of cycle start.

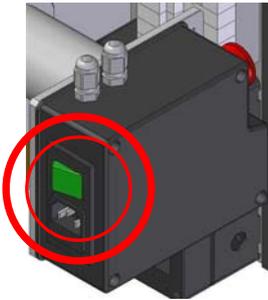


Sensor adjustment is carried out moving the table toward the rear of the machine. Insert the sensor in the "CP3" cylinder until red LED ignition is detected and fasten it. The sensor will read the position of the cylinder in stand-by and, as a result, the rearmost position of the table.

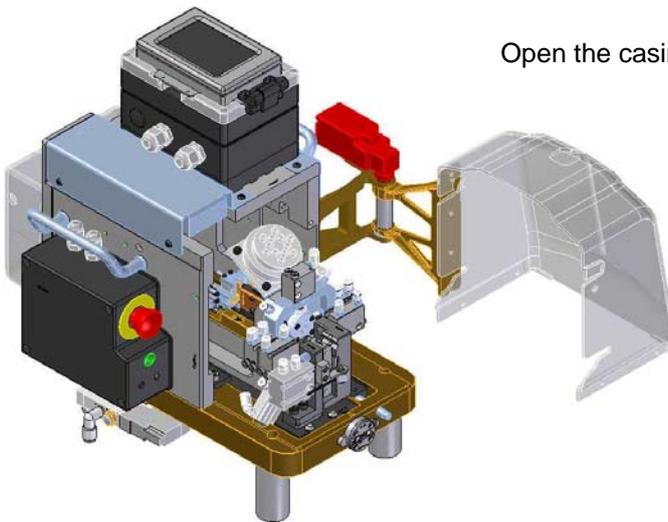
7) 90°-180° transformation



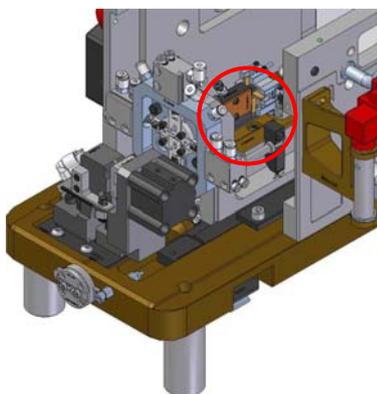
Press the emergency button.



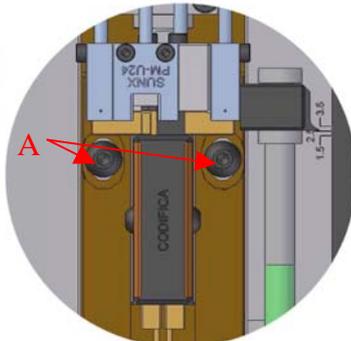
Switch off the machine via the main switch located at the rear of the machine.

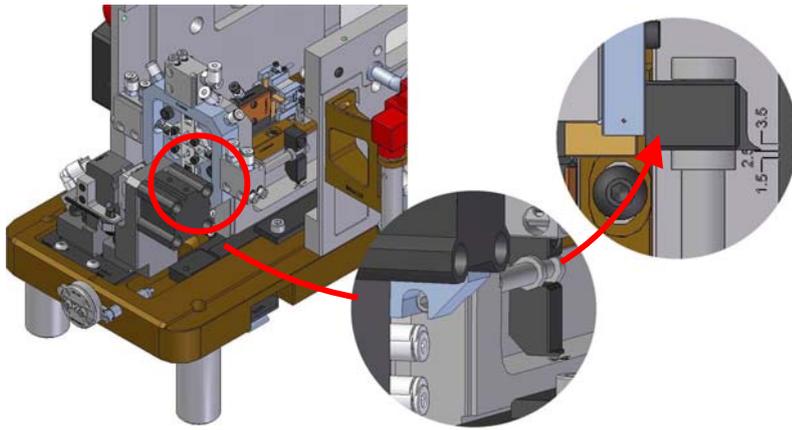


Open the casing with the captive screw.



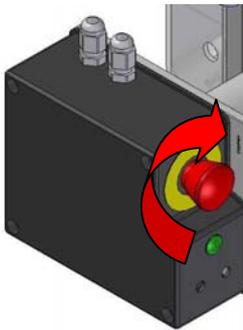
Slightly loosen the screws (A) on the carriage located near the proximity sensors, without removing them.





Move the blade unit back.
Preparation for the 180°/90° process occurs by adjusting the position of the block on the graduated scale using the dowel, using a size 3 wrench. Mecal suggests adjusting the graduated scale to:

90°_Right angle HSD= 3mm
180°_Straight angle HSD=2.7 mm
Once the desired measurement has been reached, re-tighten the screws (A) on the carriage.

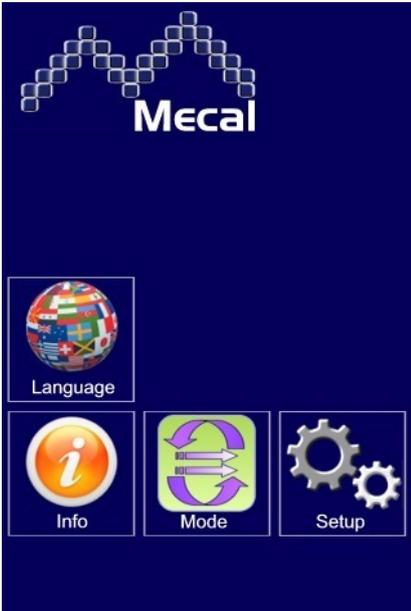


Close the casing.
Switch on the machine by means of the main switch located at the rear. Restore the emergency, releasing the button and turning it in the clockwise direction until you hear a release "click."
Equipment will automatically reset.

8) Working cycle

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

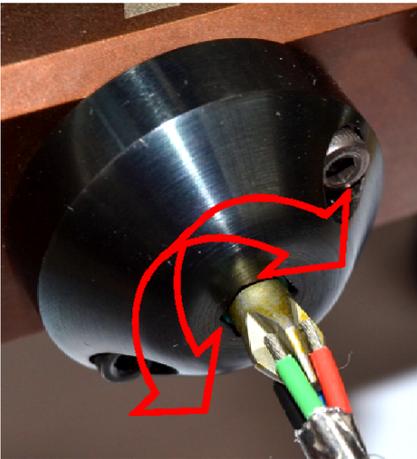
STEP 1. Display



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 choices:

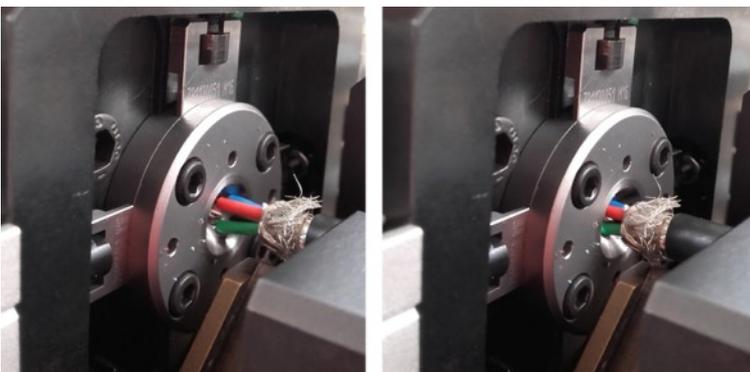
- Select language
- Set batch (pg. 23)
- Set buzzer (pg. 24)

STEP 2. Cable pre-forming



Manually pre-form the 4 conductors, insert them in the corresponding support and rotate slightly. Use your fingers to hold the four wires so as to pre-form them evenly, preventing them from falling out. Caution: Do not let any individual cables come out from their housing and make sure that the cable is straight.

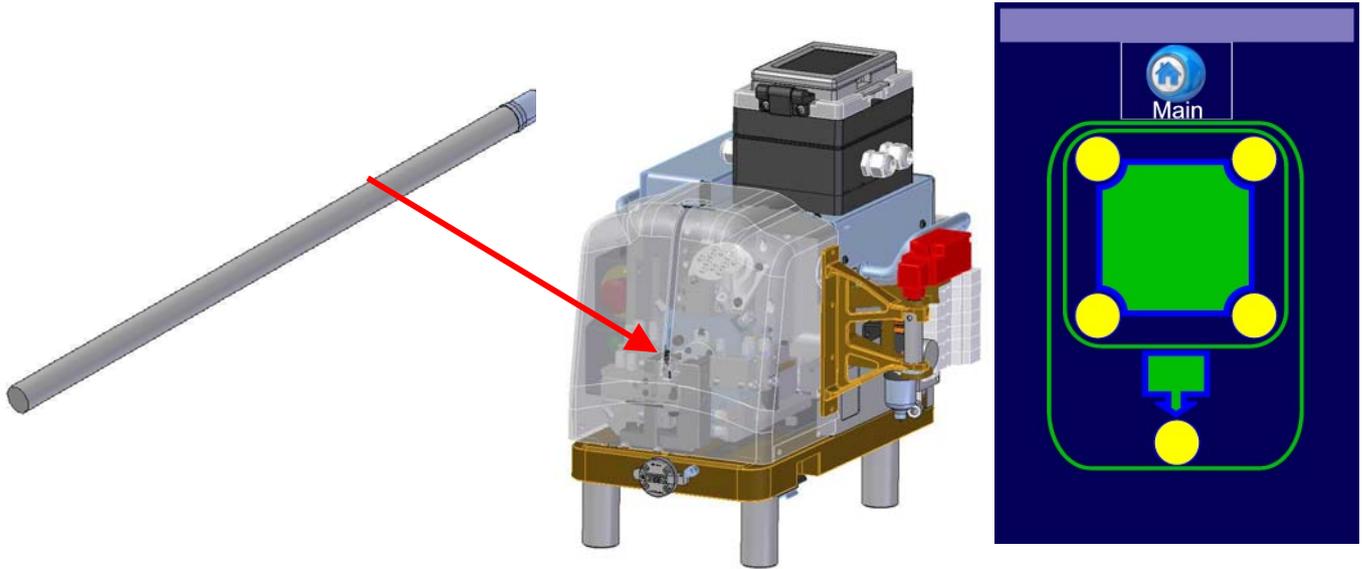
STEP 3. Cable insertion



Insert the cable in the stripping funnel.

STEP 4. Cycle start-up

Slightly push the cable until all 4 sensors switch on.



STEP 5. 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

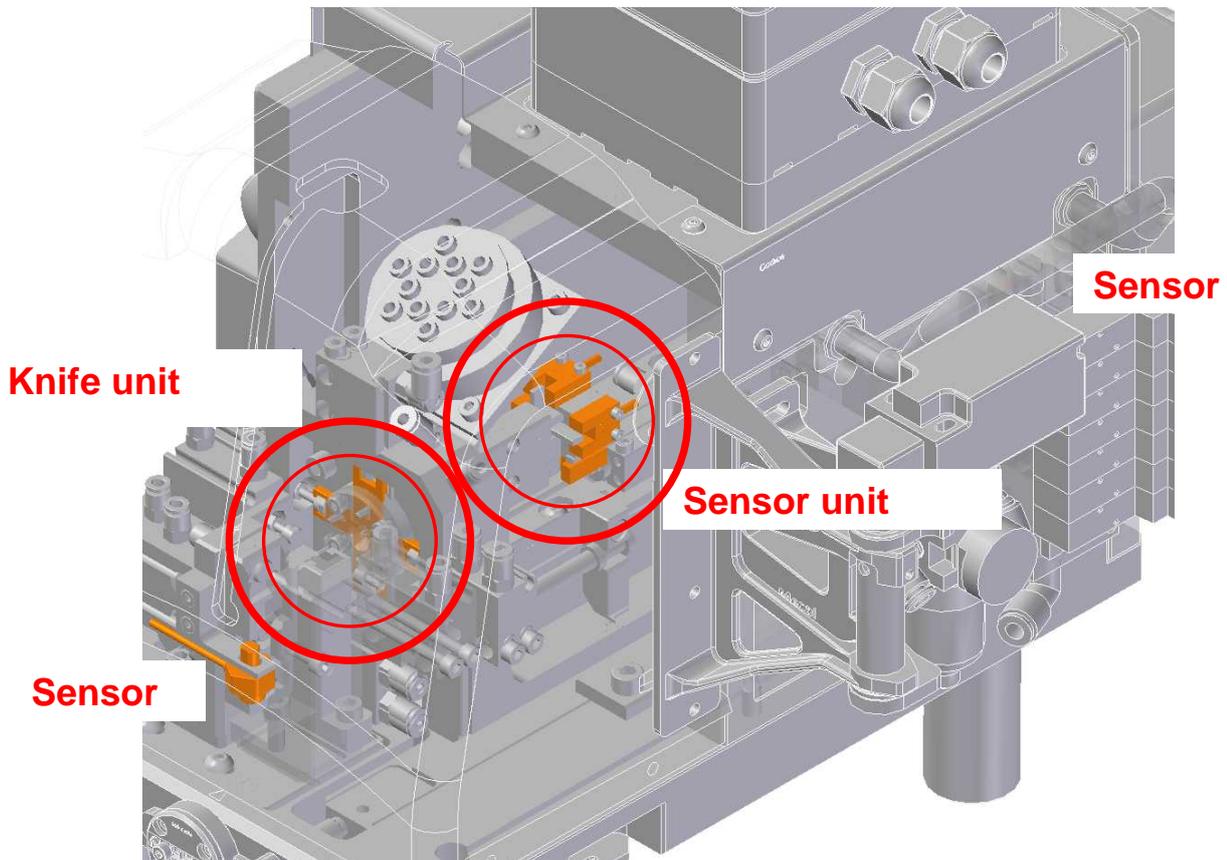
Only install spare parts with the correct code number contained on the part and included in the documentation in the attached CD. For correct use and for good quality, use **original spare parts** only.



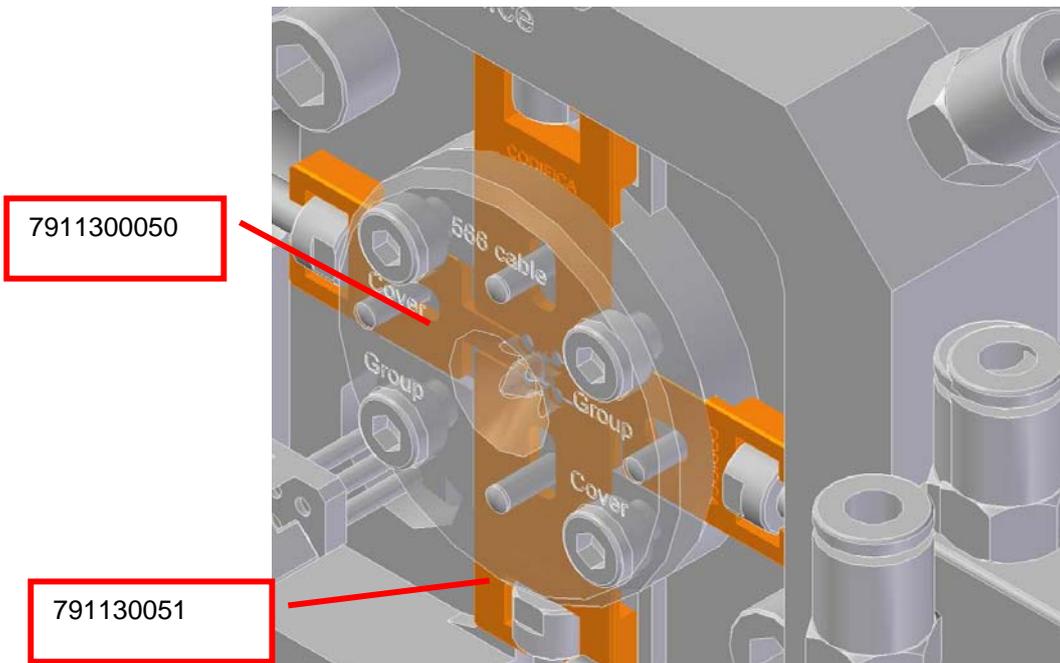
Download files in .pdf format via the "Documents" icon to access the BOM with part codes and reference to identification shown in the exploded diagram. Verify that the model and serial number correspond with the applicator in question.

9.2) Spare parts recommended by Mecal

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

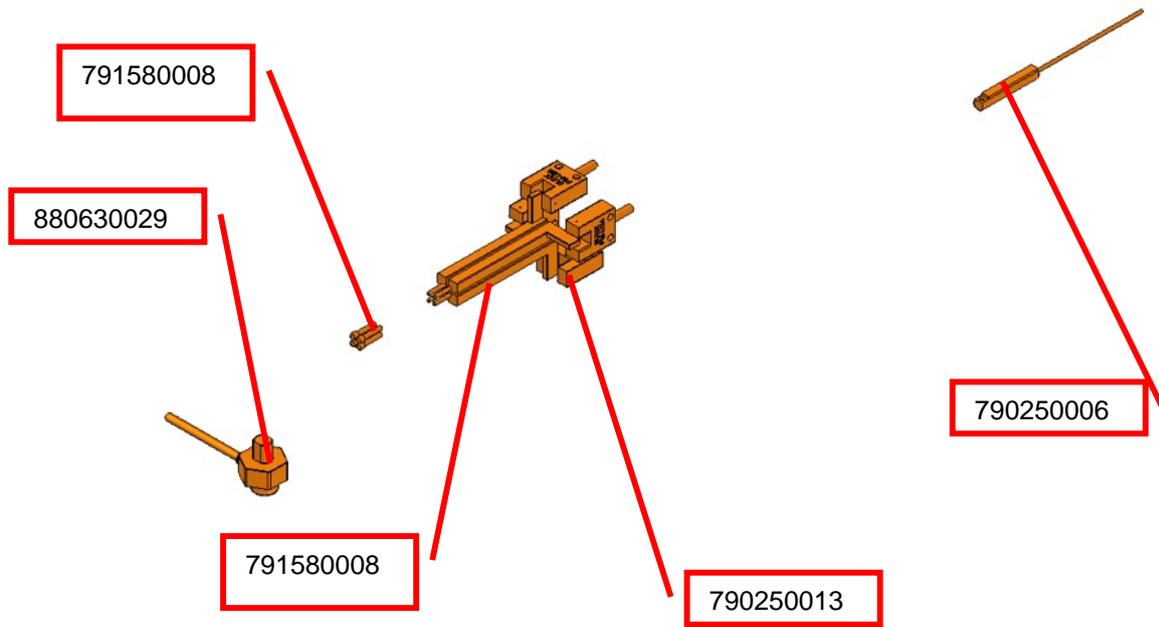


9.2.1) Knife unit



Codes:
791130050 quantity 2
791130051 quantity 2

9.2.2) Sensor unit



Codes

790250006 quantity 1
790250013 quantity 4
880630029 quantity 1
791360020 quantity 4
791580008 quantity 4

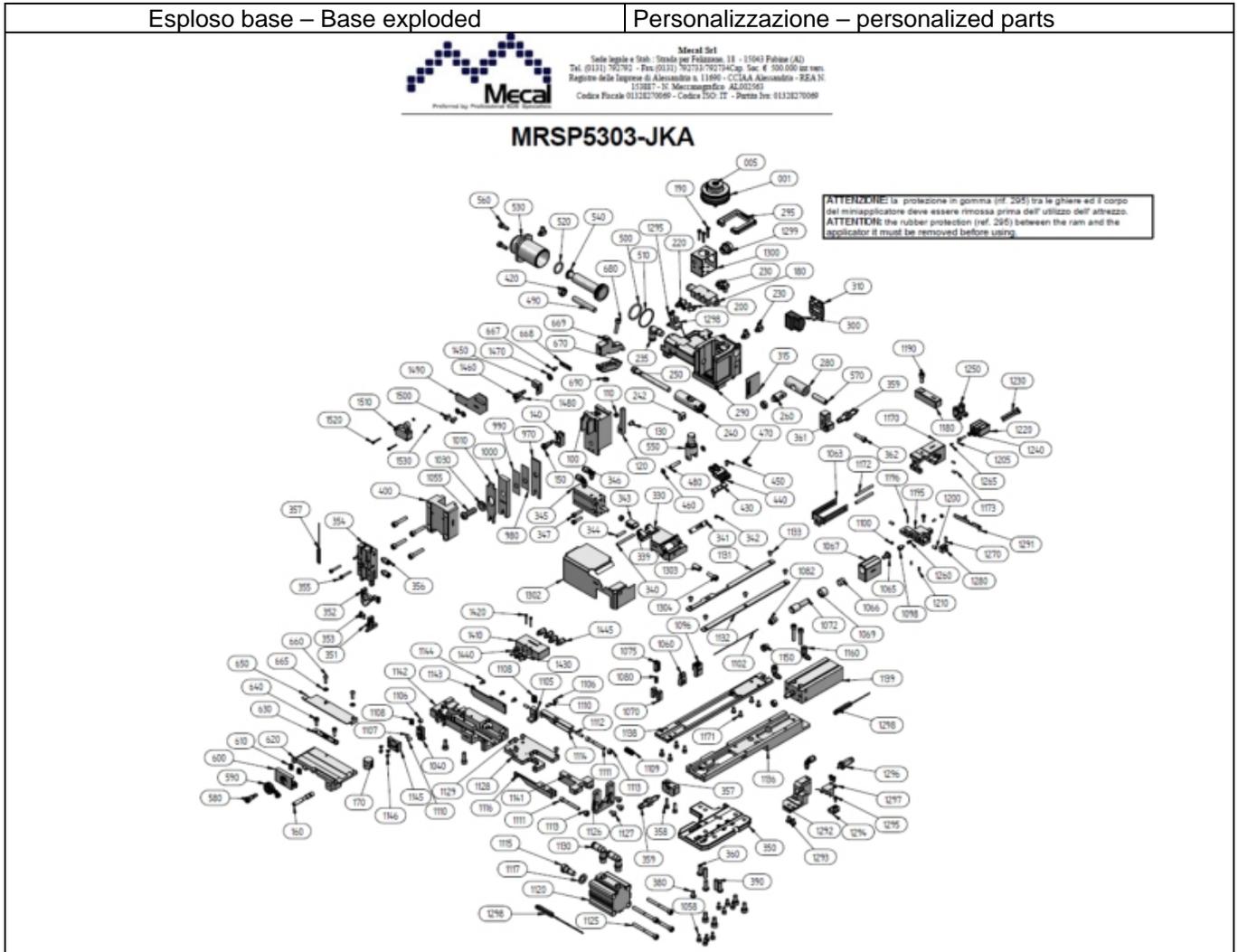
9.3) Example of documentation

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

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.23) 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) 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.
- On the display, verify proper insertion of the cable and that the five sensors are switched.
- The sensors (SQ2, SQ3, SQ4, SQ5) do not allow cycle start. Check that there are no scraps or impediments to sensor lever stroke, check that the sensor lever is properly adjusted, check that the sensors have not become disconnected or the cable damaged,
- Sensor SQ1 is in error status; the table may not be in the correct position. Check that there are no impediments to the table stroke, verify that the sensor 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 the cable presence. The cable may not have been inserted properly, the sensor is dirty, it has not been adjusted properly, or it has not been secured correctly.
- The clamp cylinder is not locking the cable. Check that the cylinder sliding area is clean.
- The cable has not been inserted correctly and sensors have not been switched (pg.19).
- Verify that the machine was reset the end of the previous cycle.

The cable does not enter into the stripping area:

- The cable has not been correctly pre-formed.
- The zone where cables are inserted is not clean. Check that the extractor is correctly adjusted and that pneumatic connections have been carried out properly.
-

The stripping unit is not running properly:

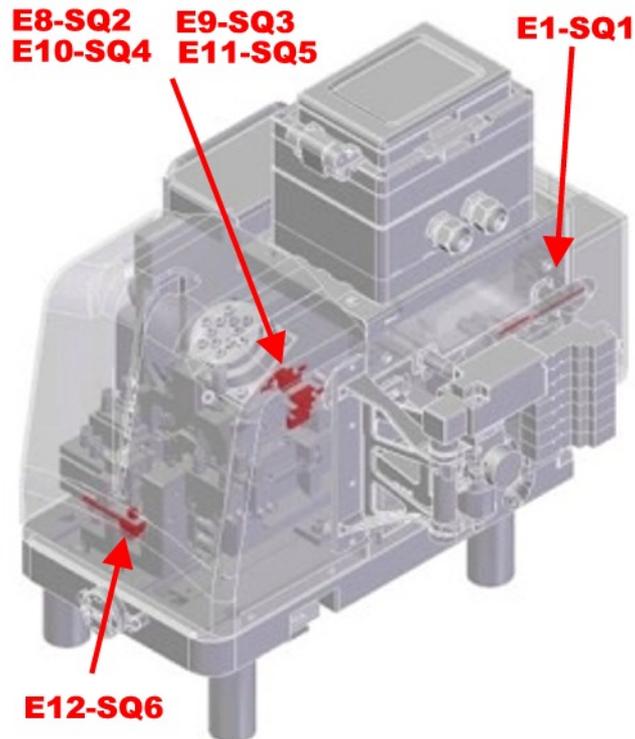
- The stripping knives are worn and must be replaced.
- Make sure that locking screws are not loose and that the unit has clearance.
- The sensor levers have not been adjusted suitably.
- Make sure that the sensor block sliding area is clean.

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

- Sensor SQ1 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 unit is not in the correct position. Verify that there are no mechanical impediments in the sliding area.
- 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	SQ1	Insulation removal slide unit 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.
E8	SQ2	Cable presence sensor at top right	<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.
E9	SQ3	Cable presence sensor at bottom right	<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.
E10	SQ4	Cable presence sensor at bottom left	<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.
E11	SQ5	Cable presence sensor at bottom right	<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.
E12	SQ6	Cable presence 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 - 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	SQ1	Insulation removal slide unit cylinder sensor
E8	SQ2	Cable presence sensor at top right
E9	SQ3	Cable presence sensor at bottom right
E10	SQ4	Cable presence sensor at bottom left
E11	SQ5	Cable presence sensor at bottom right
E12	SQ6	Cable presence 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

INSTRUCTION MANUAL

New-form Beam Sensor **Amplifier Built-in**
EX-30 Series

1 SPECIFICATIONS

Type	Thru-beam type		Diffuse reflective type	
	EX-31A	EX-31B	EX-32A	EX-32B
Item	NPN output	PNP output	EX-31A-PN	EX-31B-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)			
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	0.1mm ² 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.

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.

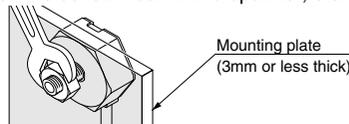
This product is not a safety sensor. Its use is not intended or designed to protect life and prevent body injury or property damage from dangerous parts of machinery. It is a normal object detection sensor.

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.

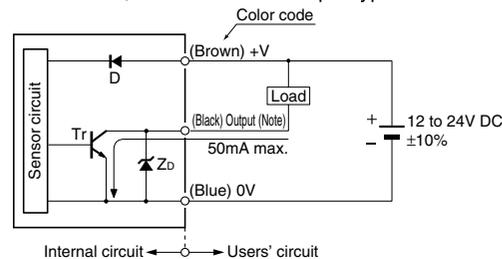
3 MOUNTING

- 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

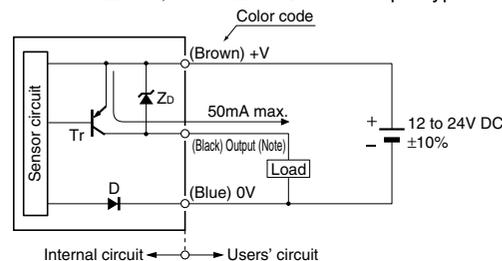
- EX-31□, EX-32□ / NPN output type



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

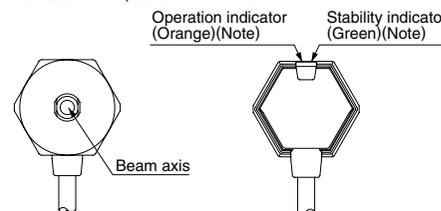


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Symbols... D : Reverse supply polarity protection diode
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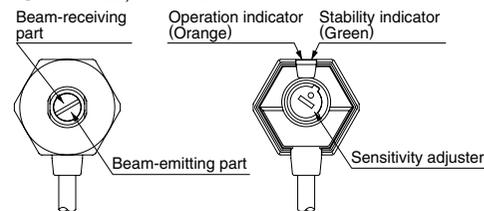
5 PART DESCRIPTION

- 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 (A) 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 (B) 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 (C).)
④		The position at the middle of points (A) and (B) is the optimum sensing position.

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

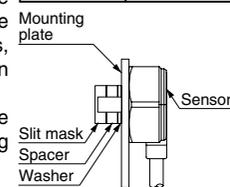
7 OPTIONAL SLIT MASK (Thru-beam type only)

- 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.



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