TRASLATION OF ORIGINAL INSTRUCTIONS

CRIMPING MACHINES

P040i – P080i – P120i

USE AND MAINTENANCE MANUAL

Revision: **01**

Date: **2021/07**

REVISION

REVISIONE				
MODEL	**LANGUAGE**	**DATE**	**VERSION**	**NOTES**
P040i **P080i** **P120i**	English	01/12/2020	00	Release
P080i	English	15/07/2021	01	Added barrier safety cover version

The information contained in this manual is the property of **Mecal S.r.l.**

The drawings and other documents accompanying the machine are the property of **Mecal S.r.l**.

Distributing and/or duplicating this manual in any form, whole or partially, without written authorisation from **Mecal S.r.l.** is prohibited.

Mecal S.r.l. reserves the right to modify the characteristics of the product described in this manual without notice.

In case of doubts or difficulties in understanding or interpreting this manual, the original/official version indicated as "ORIGINAL INSTRUCTIONS" on the cover must be considered as the valid version.

All of the images included in this manual should be considered as examples only, as they may not refer to the machine described here.

Crimping Machine P040i / P080i / P120i, the subject of this manual, will hereinafter be referred to as "machine".

STRUCTURE OF THE MANUAL

The manual is divided into 9 chapters, the last of are the attachments.

CHAPTER 1 - GENERAL INFORMATION

This chapter contains general descriptions regarding the structure of the manual.

CHAPTER 2 - SAFETY

This chapter contains a description of the standards, the environmental operating conditions, ergonomics, the accident prevention devices used, the residual risks and the monitoring plates applied to the machine.

CHAPTER 3 - GENERAL DESCRIPTION

This chapter contains a description of the operating principles of the machine, the work cycle, the general technical data and the description of the mechanical, electrical and fluidic units making up the machine itself.

CHAPTER 4 - PACKAGING AND TRANSPORT

This chapter contains instructions for correctly packaging, handling, transport and unloading at the user facility.

CHAPTER 5 - INSTALLATION

This chapter contains instructions for correctly carrying out installation at the user facility, connections to the facility's power supplies, verifications, checks and any adjustments to be carried out before start-up.

CHAPTER 6 - USE

This chapter, intended for operators and maintenance personnel, contains instructions for starting and using the machine in its various operating cycles, with descriptions of the controls available to the operator, the most important operating sequences and use of the diagnostic systems.

CHAPTER 7 - DISMANTLING

This chapter contains warnings and instructions for correctly performing decommissioning and dismantling of the machine at the end of its operational life.

CHAPTER 8 - MAINTENANCE

This chapter, intended for maintenance technicians, contains the machine maintenance plan. It provides warnings, precautions and instructions for properly performing maintenance operations on the machine.

CHAPTER 9 - ATTACHED DOCUMENTATION

INDEX

1. GENERAL INFORMATION

1.1 INTRODUCTION

This manual contains all the information necessary for correct installation, regular use and suitable maintenance of the machine.

Mecal S.r.l., manufacturer of the equipment in question, will hereafter be referred to as "**Manufacturer**".

The company that purchased the equipment will hereinafter be referred to as "**Client**".

The Manufacturer requires that personnel in charge of running and maintaining the machine, as well as personnel in charge of transport and assembly operations, read this document.

This document is the use and maintenance manual for the machine:

CRIMPING MACHINE P040i

CRIMPING MACHINE P080i

CRIMPING MACHINE P120i

and has been compiled in compliance with Machinery Directive 2006/42/EC.

The Use and Maintenance manual is to be considered an integral part of the machine and must be kept until its final disposal. It must be kept by the person in charge of the machine after final installation.

1.2 SUPPORT

For technical support, contact:

MECAL S.r.l.

Registered and production office: Strada per Felizzano, 18 - 15043 Fubine (AL)

Tel. (0131) 792792 - Fax (0131) 792733/792734 Share Cap. € 500,000 fully paid

Register of Alessandria Companies n. 11690 - CCIAA Alessandria - REA N. 153887 - N. IEC AL002563

Tax Code 01328270069 - ISO Code: IT - VAT: 01328270069

1.3 GLOSSARY

Emergency stop – emergency stop function: function that is provided:
- To avert arising or reduce existing hazard to person, damage to machinery or to work in progress, and
- To be initiated by a single human action

Control circuit (of a machine): circuit used to control the operation of the machine and for protection of the power circuits.
Component: constitutive part of the electrical equipment, usually specified by its function, but used in various applications.
Machinery Directive: DIRECTIVE 2006/42/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the approximation of the laws of the Member States relating to machinery.
Control device: device inserted in a control circuit used for use of the machine.
Protective device: means of protection other than a guard.
Supplier: Supplier: entity (Manufacturer, installer, systems integrator) that supplies the equipment or services associated with the machine (the user can also act as a Manufacturer for himself).
Information for use: Protective measure consisting of communication links (for example, text, words, signs, signals, symbols, diagrams) used separately or in combination, to convey information to the user.
Machine: set of pieces or components, of which at least one is mobile, connected to each other, and possibly with actuators, with control and power circuits, etc., connected for a well-defined application, particularly for the transformation, treatment, displacement and conditioning of a material.
Interchangeable equipment modifying the function of a machine, which is placed on the market for the purpose of being assembled with a machine or a series of different machines or with a tractor by the operator himself in so far as this equipment is not a spare part or a tool.
Malfunction: inability of a machine to perform its intended function.
Marking: symbol and writings for identification of the machine, affixed by the Manufacturer.
Protective means: guard or protection device.
Safety measure: means that eliminates or reduces a hazard.
Failure: failure: the end of an element's ability to execute a required function.
Operator: person qualified to install, operate, adjust, clean and maintain the machine.
Hazard: potential source of harm.
Exposed person: any person who has their body or any part of their body in a danger zone.
Qualified personnel or qualified maintenance personnel: those persons who have attended specialisation courses, training, etc. and have experience in the installation, commissioning and maintenance, repair, transport and handling of the machine.
PLC: Programmable Logic Control able to manage and control all machine movements. Equipped with electronic boards to control the various devices and to receive the relative control signals.
Safe operating procedure: a work method that reduces risks.
Protections (protection criteria): means of protection that uses measures to protect persons against hazards that cannot be rationally eliminated, against risks that cannot be sufficiently reduced by protection measures integrated in the design.
Safety protections: guard or protective device used as a safety measure for the protection of people from present or latent danger.
Contact: person responsible for conducting certain operations or assessments that may occur during the work or maintenance phase.

Guard: physical barrier, designed as part of the machine (for example: using screws, nuts, welds), to provide protection.
Fixed guard: guard affixed in such a manner (for example by screws, nuts and welding) that it can only be opened or removed by the use of tools or by destruction of the means to which the guard is affixed.
Movable guard: guard that can be opened without the use of tools.
Risk: combination of probability of occurrence of harm and the severity of that harm.
Residual risk: risk that remains after taking protective measures.
Emergency situation: dangerous situation that needs to be urgently interrupted or avoided.
Transport: set of operations to transfer the machine from the manufacturer's assembly site to the Client's final work site.
Intended use: the use of machinery in accordance with the information provided in the instructions for use.
Improper use: use of the machine outside the limits specified in the technical documentation.
User: entity that uses the machine and associated electrical equipment.
Work Area: volume delimited by accident prevention guards and intended for machine operation.
Danger zone: area inside or near the machine where the presence of an exposed person constitutes a risk to his/her health and/or his/her safety..

1.4 SYMBOLS

The manual uses some symbols that are intended to draw the attention of the reader and highlight some particularly important aspects.

SYMBOL	MEANING	NOTES
	**HAZARD**	Indicates a danger with risk of injury or death to the user. Pay the utmost attention to the text blocks indicated by this symbol.
	**CAUTION**	Represents a warning of possible deterioration or damage to the machine and/or equipment. Pay attention to the text blocks indicated by this symbol.
	**WARNING NOTE**	Indicates a warning or a note on key functions or useful information. Pay attention to the text blocks indicated by this symbol.
	**ADDITIONAL INFORMATION**	Text blocks containing additional information are introduced by this symbol. This information has no direct relation to the description of a function or the development of a procedure. It may be references to other complementary documentation, such as instruction manuals for the use of attachments, technical documents or other sections of this manual.

1.5 MANUFACTURER CONTACTS

The Manufacturer's Technical Department is always available to Clients for any type of information or clarification concerning use, maintenance, installation, etc.

The latter should always put the questions in clear terms, with references to this manual, always indicating the data shown on the identification plate of the machine in question.

Any requests for support at the Customer’s site, or for clarification regarding the technical aspects of this document, must be addressed to:

Mecal S.r.l.
Registered office and Plant: Strada per Felizzano, 18 - 15043 Fubine (AL)
Tel. (0131) 792792 - Fax (0131) 792733/792734Cap. Cap. € 500,000 fully paid
Register of Alessandria Companies n. 11690 - CCIAA Alessandria - REA N. 153887 - N. IEC AL002563
Tax Code 01328270069 - ISO Code: IT - VAT: 01328270069

1.6 SAFETY STANDARDS

The requirements, indications, standards and related safety notes described in the various chapters of the manual are intended to define a series of behaviours and obligations which must be followed when performing the various activities that constitute the intended use of the machine, aimed at operations that are safe for personnel, equipment and the surrounding environment.

The safety standards listed are intended for all authorised personnel, instructed and delegated to perform the various activities and operations of:

- Transport
- Installation
- Operation
- Use
- Management
- Maintenance
- Cleaning
- Decommissioning and dismantling

1.7 MANUFACTURER'S RESPONSIBILITIES

The Manufacturer declines all responsibility deriving from incorrect or improper use of the machine in question and from any damage caused by the use of non-prescribed spare parts, from maintenance operations not carried out correctly or from tampering with circuits, components and system software.

The responsibility concerning the application of safety requirements, reported as follows, is at the expense of the technical personnel responsible for activities foreseen on the machine. Technical personnel must ensure that the operators authorised to carry out the required activities are qualified, that they comply with and are aware of the provisions contained in this document and of the general safety standards applied to the machine.

Failure to comply with safety standards may result in injury to personnel and damage to equipment.

1.8 MACHINE MANAGEMENT

Machine management is only allowed to be performed by authorised and appropriately trained operators, or operators with at least sufficient technical experience.

Operators in charge of machine use and maintenance must be aware that the knowledge and application of safety regulations is an integral part of their work.

Operators not authorised to work on the machine must not have access to their control panels.

Perform the following operations before starting the machine:

- Read this manual carefully.
- Be familiar with which protections and emergency stop devices are present on the machine, where they are located and how they work.

Removing or even partially removing the protections, safety devices or monitoring plates affixed on the machine is prohibited. In the event of malfunction or failure of these devices, immediately repair or replace them.

1.9 CONDITIONS CHECK

Check that machine has not been damaged during transport. Please therefore report any accidents or presence of visible damage (signs or traces of impact) as follows:

- With a written note on the Transport Document.
- Communicating the damage detected by registered letter to the carrier and to **Mecal S.r.l.**, within 48 hours of receipt of the machine.

1.10 WARRANTY

Mecal S.r.l. guarantees that its machines are free from manufacturing defects for the period of time indicated in the stipulated contractual conditions.

The purchaser is only entitled to the replacement of parts recognised as defective: the costs of packaging and transport, as well as any installation, are at the purchaser's expense. In this case, the following must be specified:

- Date and number of the purchase document
- Machine model
- Serial number

No claims for damages for production losses caused by any periods of machine downtime will be recognised.

The warranty does not cover damages due to use that does not comply with the contents of this "Use and Maintenance Manual," which is an integral part of the machine, including any maintenance that does not comply with the instructions provided.

The warranty will not be recognised if any unauthorised modifications have been made to the machine.

Modifications to or tampering with safety devices are strictly prohibited.

In the event of breakages during the warranty period, original spare parts must be used for the warranty to be valid.

Repair work must only be carried out by specialised operators who are familiar with the machine.

2. SAFETY

2.1 GENERAL INFORMATION

The Customer must instruct personnel regarding the risks of injury, the safety devices installed on the machine and the general accident prevention rules provided for by European Community directives and by legislation in the country where the machine is installed.

Operators must be familiar with the position and operation of all machine controls and their characteristics.

Tampering with or unauthorised replacement of one or more machine components and the use of accessories or spare parts other than those recommended can cause a risk of injury.

HAZARD

Excluding/tampering with the safety devices on the machine is strictly prohibited. The Manufacturer declines all responsibility for the safety of the machine in the event of non-compliance with this prohibition.

CAUTION

It is the responsibility of the operator using the machine to ensure that the area is safe and free of people or objects.

CAUTION

Use of the machine processing hot materials is prohibited.

CAUTION

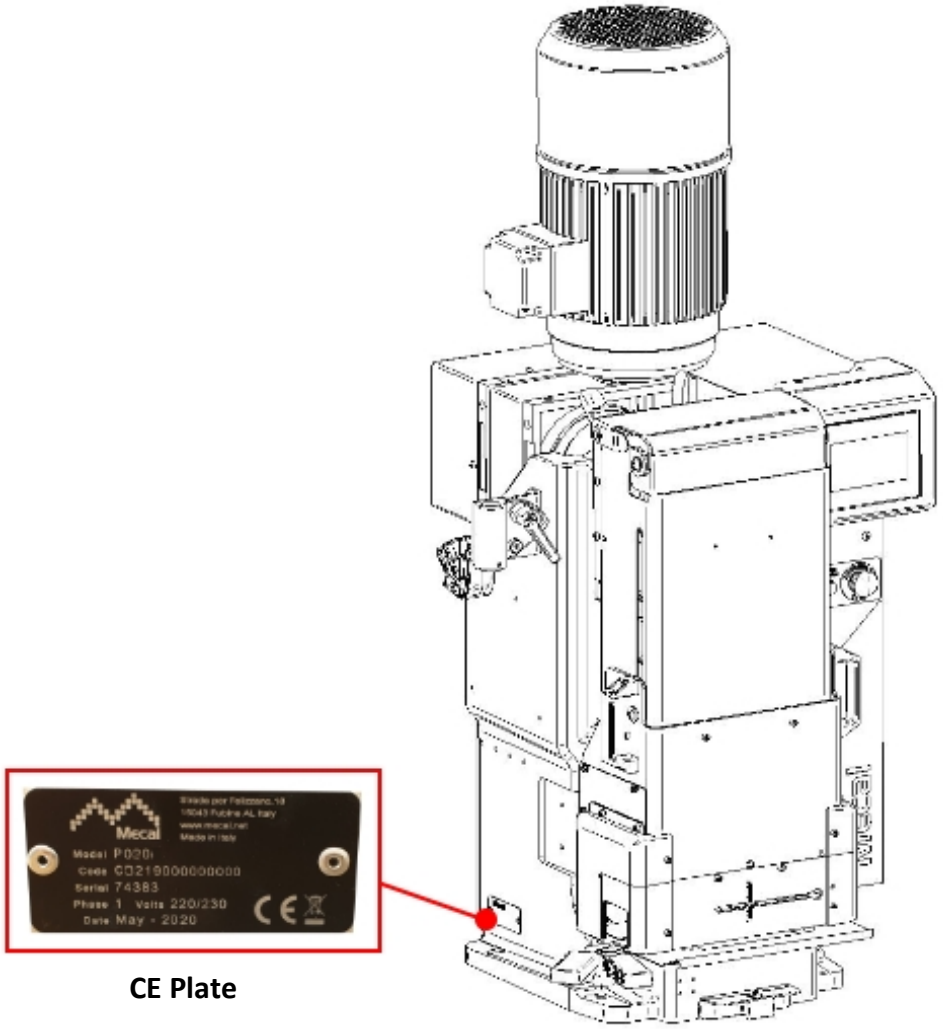
The customer/user is responsible for loading the material to be processed.

2.1.1 MACHINE CERTIFICATION

The machine is supplied with an EC Declaration of Conformity with the essential safety requirements in accordance with Machinery Directive 2006/42/EC (Annex II A) and Electromagnetic Compatibility Directive 2014/30/EU.

CAUTION

Any modification made to the machine will immediately invalidate the CE certification issued by the Manufacturer.



CE Plate

2.1.2 INTENDED AND IMPROPER USES

The machine has been designed and manufactured to perform crimping on cold ferrous materials.

The machine is able to work with applicators that comply with the following limit characteristics:

	P040i	P080i	P120i
Max. crimping force	40 kN (8992 lbf)	80 kN (17985 lbf)	120 kN (26997 lbf)
Working height for standard applicators	135.8 mm (5.35 in)	135.8 mm (5.35 in)	135.8 mm (5.35 in)
Working height for die	212 mm (8.35 in)	212 mm (8.35 in)	212 mm (8.35 in)
Max. stroke	40 mm (1.57 in)	50 mm (1.97 in)	50 mm (1.97 in)

The machine cannot be used for any use other than that envisaged or for machining other than that agreed upon.

HAZARD

Use of the machine for purposes not described in this manual is considered **IMPROPER USE**. The Manufacturer declines all responsibility for any damage caused to property and/or persons and deems all forms and types of machine warranty to be forfeited. The Manufacturer declines all responsibility in the event of tampering with the machine, for unauthorised modifications and for maintenance operations performed by untrained personnel.

HAZARD

In the event of abnormal behaviour of the machine or lack of power supply, carrying out any type of movement is prohibited, as that is under the specific competence of the operators in charge of maintenance.

CAUTION

Use of the machine by inadequately qualified and instructed personnel is prohibited. The machine user must have read and understood this document.

2.2 ENVIRONMENTAL OPERATING CONDITIONS

The area where the machine is located must be a covered environment equipped with all the safety arrangements deriving from the laws in force in the user country.

2.2.1 FIRE PROTECTION INSTALLATION

The machine is not equipped with its own fire protection system.

2.2.2 EXPLOSIVE ATMOSPHERE

This machine is not designed or built to work in environments with explosive or partially atmospheric atmosphere.

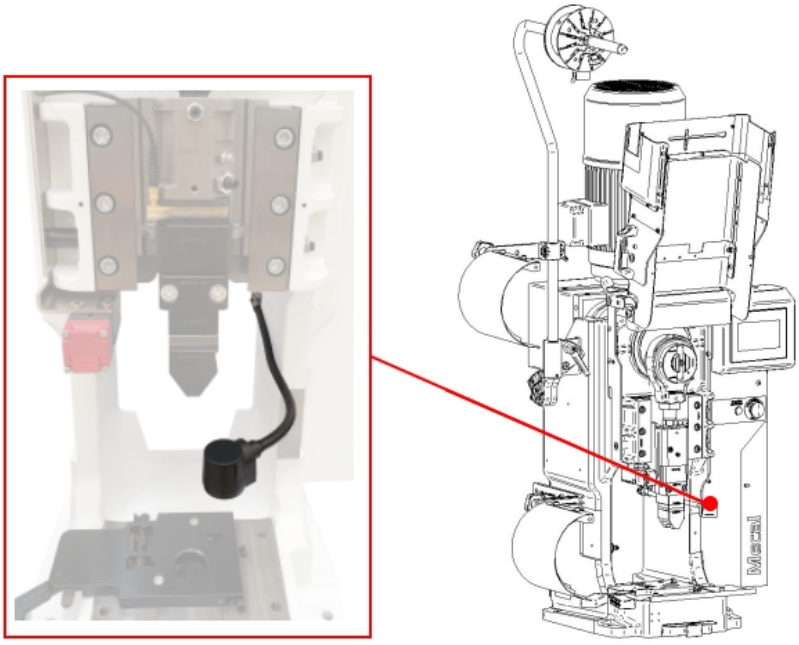
2.2.3 LIGHTING

The machine is equipped with its own lighting system to illuminate the crimping area and to visualise the work cycle.

NOTE

It is the customer's responsibility to install and use the machine in a suitably lit environment.

For this reason, a lighting value of at least 500 LUX is recommended for normal uses with medium details and medium contrasts, as per standard UNI-EN 1837.



2.2.4 ERGONOMICS

The machine must be positioned and adjusted to meet the physical and cognitive ergonomics criteria, considering:

- Easy human/machine interfacing.
- Preventing a prolonged concentration and rhythm conditioned by the machine.
- Work spaces suitable for loading and unloading the machine reels.
- A possible variability in the physical dimensions and strength of the operator working.

In case of maintenance, the units that make up the machine are sized in such a way as not to create fatigue or stress to the operator working.

2.2.5 VIBRATIONS

The machine does not produce vibrations that are dangerous for the health of personnel working.

CAUTION

Excessive vibrations can only be caused by a mechanical failure, which must be immediately reported and eliminated.

2.2.6 NOISE

Noise measurements were made in accordance with the provisions of legislation on acoustics. The phonometric data is kept by the Manufacturer e.

The operating characteristics of the machine are such that, when empty, the overall noise generated is less than 75 dB (A).

NOTE

The sound pressure level under actual operating conditions depends on the type of work performed.

NOTE

Measurements of worker noise exposure levels must be carried out by the customer in accordance with the legislation in force in their own country.

2.2.7 ELECTROMAGNETIC EMISSIONS

The machine contains electronic components subject to the Electromagnetic Compatibility regulation, conditioned by conducted and radiated emissions.

The emission values comply with the standard thanks to the use of components complying with the Electromagnetic Compatibility Directive, suitable connections and the installation of filters where necessary.

The machine is therefore compliant with the Electromagnetic Compatibility Directive.

CAUTION

Any maintenance on electrical equipment carried out in a non-compliant manner, or involving the incorrect replacement of components, may compromise the efficiency of the equipment itself.

2.3 DISPOSAL OF EXHAUSTED MATERIALS

In its normal operation, the machine does not produce any kind of waste or exhausted material.

There are specific regulations for environmental protection in every country with relation to the disposal of such materials.

The Customer must be aware of these regulations and operate in such a way as to comply with them.

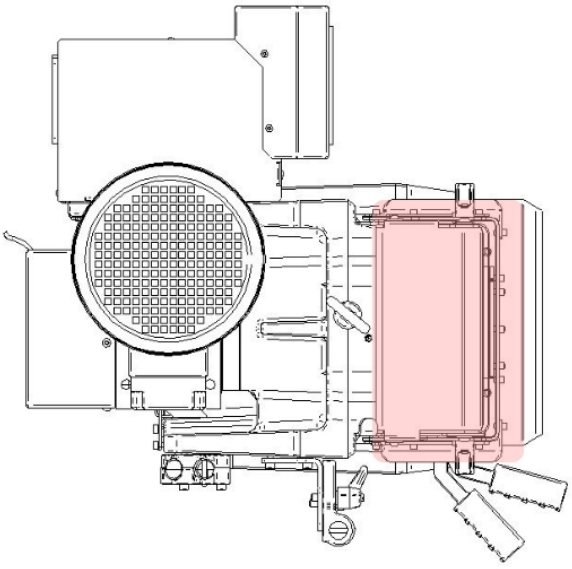
In particular, please see chapter 7 regarding the disposal of the materials that make up the machine.

2.4 DANGER ZONES

The danger zones of the machine are delimited by guards (fixed and movable) or barriers. These areas must be accessed as indicated in this manual.

The control systems for the normal machine operating cycle are located outside the area delimited by the guards or the barriers.

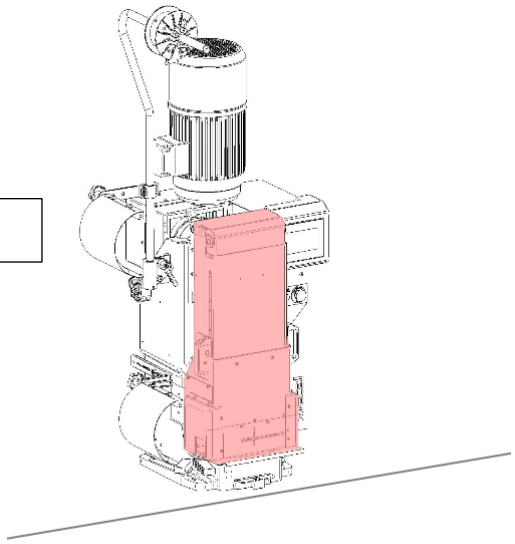
The following drawing shows the danger zones where only authorised personnel responsible for this type of intervention can have access.



Danger zone

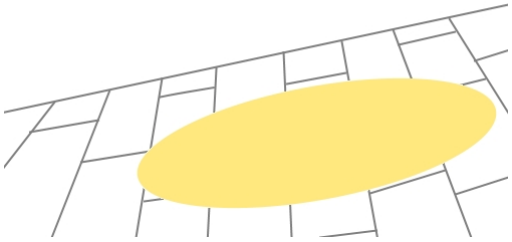
Operator workstation (loading/unloading and manual operations)

Rear



Front

(Operator side)



2.5 SAFETY DEVICES APPLIED TO THE MACHINE

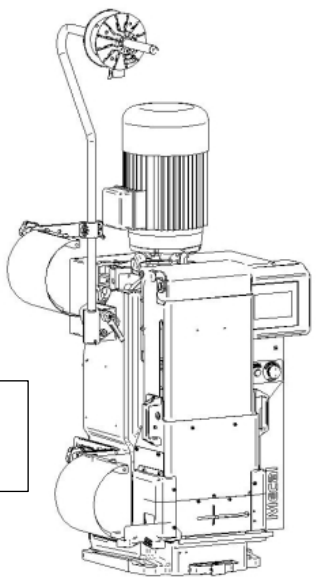
The machine is equipped with the following safety devices:

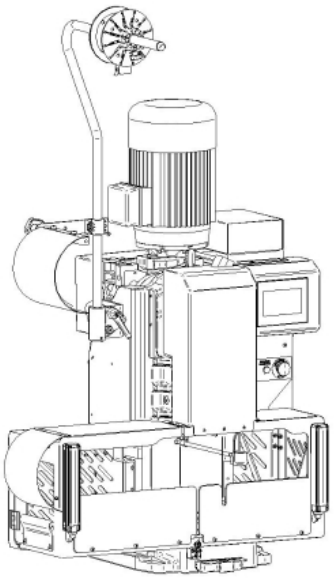
DEVICE	FUNCTION
Electrical power switch	Cuts off electrical power
Emergency button	Machine emergency stop
Protections	Separates danger zones
Protection barriers	Separates danger zones
Interlocked safety switches on a manual guard	Immediately stops all moving parts if the guard is opened
Fuses	Cuts off power in case of overload or short circuit
Foot pedal safety switch	Starts the work cycle

Tilting safety cover version: the protection consists of a main steel structure, fixed to the machine frame and a Lexan door. Both components are manually operated: the door slides up to allow access to the applicator, while the main structure tilts, allowing you to reach the slide assembly for adjustments and to install or remove applicators or dies.

Safety cover version with barrier: equipped with a pair of barriers (transmitter and receiver) that monitor access to the crimping area. When the operator enters the crimping area, the barriers detect him/her and intervene instantly, stopping any moving parts. The safety cover is opened at the door, to allow the operator to access the crimping area more easily, for the installation or removal of applicators or dies.

Tiltable safety cover version



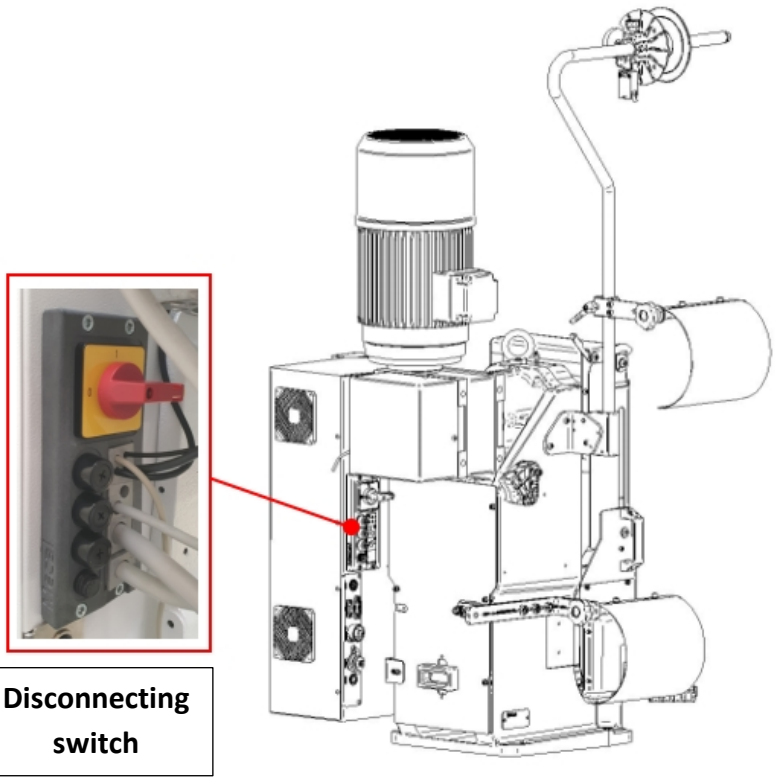


Safety cover version with barrier

2.5.1 ELECTRICAL POWER SWITCH

Function: Cuts off electrical power.

Features: Before performing any operations on the machine, disconnect the power source by turning the switch located on the electrical box to position (O) OFF, locking it.



Disconnecting switch

CAUTION

In case of maintenance work on the power switch. The Manufacturer declines all responsibility in the event that the machine is operated with guards incomplete, open and/or not installed.

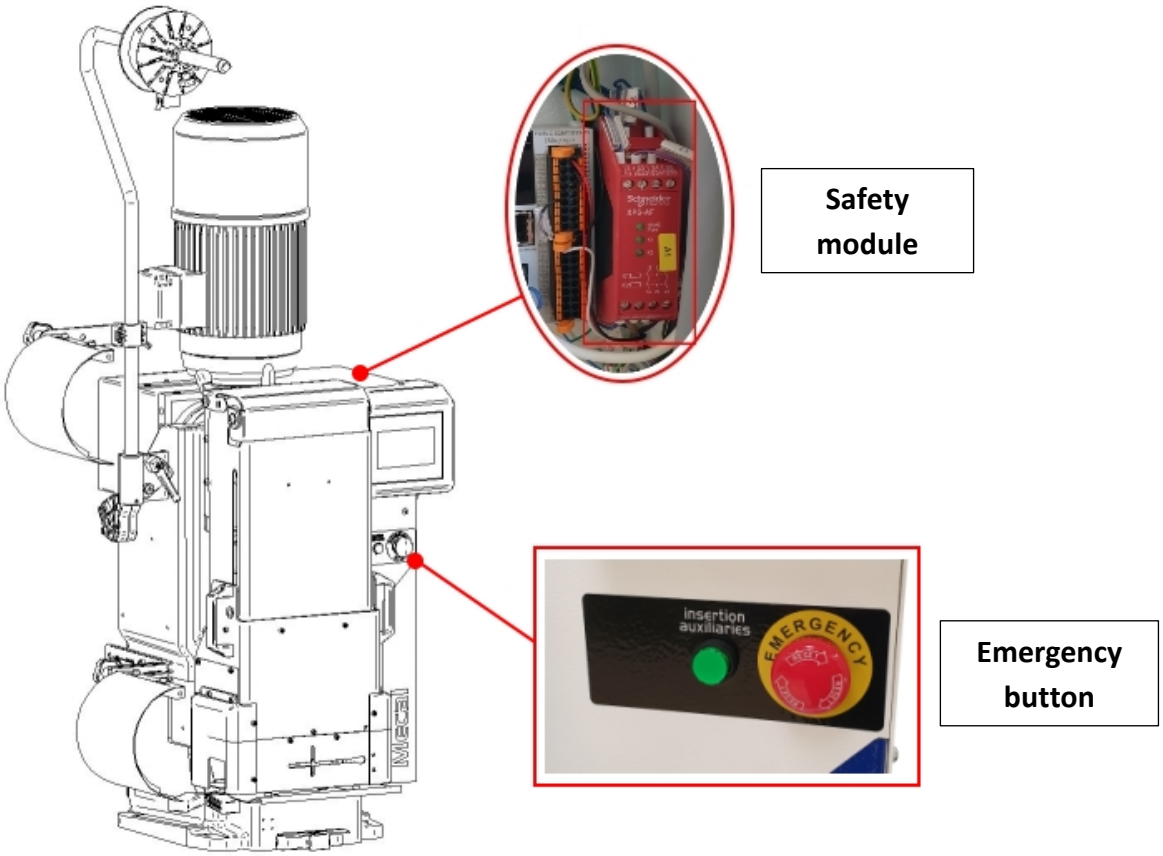
2.5.2 EMERGENCY BUTTON

Function: Machine emergency stop.

Features: In the event of risk to operators and/or the machine itself, press the red push-button.

Pressing this button causes deactivation of all movements and control system outputs. Once pressed, the self-locking emergency button stays in position and must be rotated to reset it.

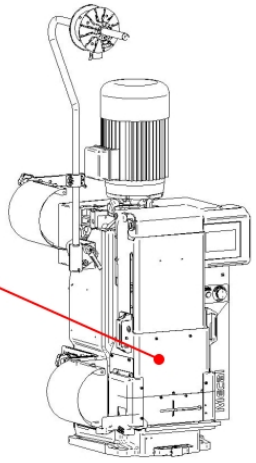
The button is controlled by the safety module inside the electrical cabinet.



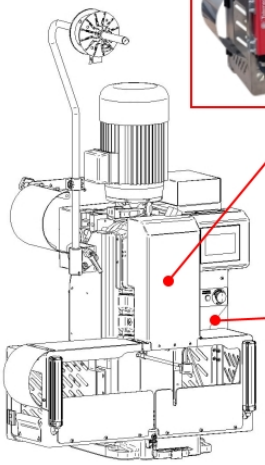
2.5.3 PROTECTIONS

Function: Separates danger zones.

Features: The protections allow safe access to the internal parts of the machine. Movable guard opening is controlled manually by the operator.



Tiltable safety cover version



Safety cover version with barrier and safety module

CAUTION

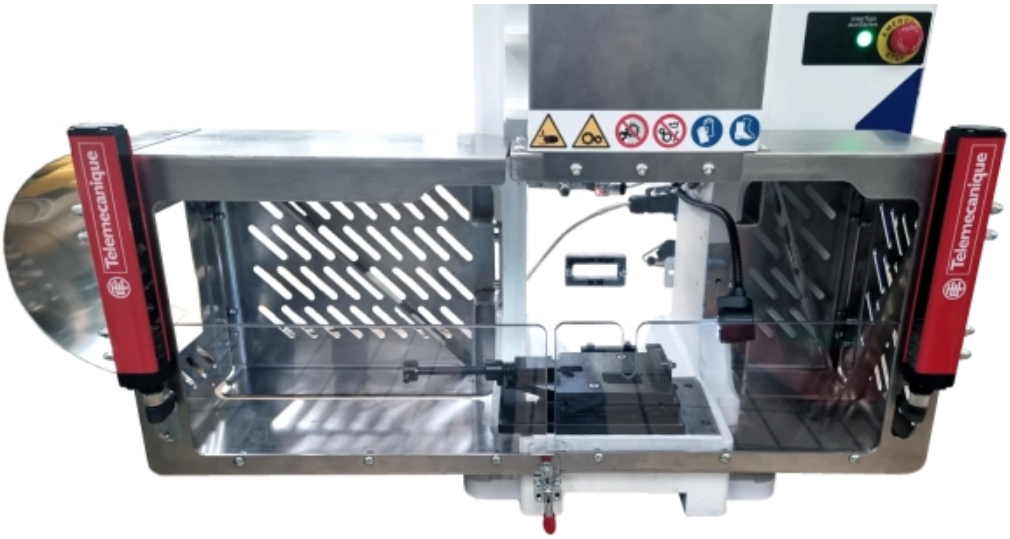
In case of maintenance, simply opening the guards is not enough to cut off power. The Manufacturer declines all responsibility in the event that the machine is operated with guards incomplete, open and/or not installed.

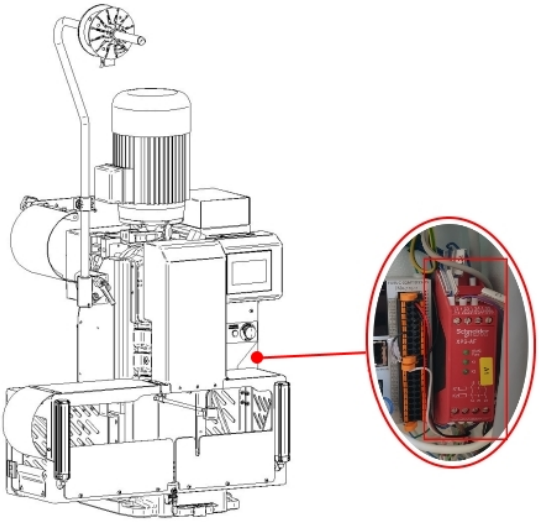
2.5.4 PROTECTIVE BARRIERS

Only present on version with barriers.

Function: Separates danger zones.

Features: Protection barriers allow safe access to the internal parts of the machine when it is in operation. If crossed by the operator, the barriers intervene instantly, stopping any moving parts, and are controlled by the safety module.





Safety module

CAUTION

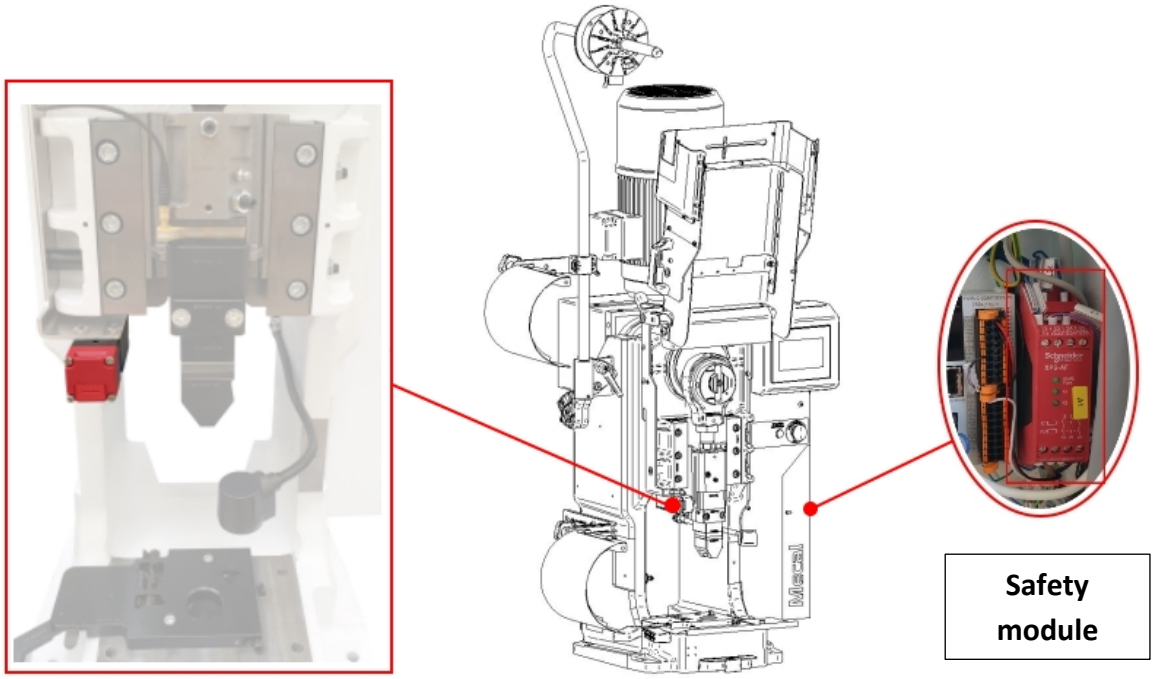
In case of maintenance work on the power switch. The Manufacturer declines all responsibility in the event that the machine is operated with guards incomplete, open and/or not installed.

2.5.5 INTERLOCKED SAFETY SWITCHES

Only present on tiltable protection version.

Function: Stops the moving machine parts when the guard is opened.

Features: The interlocked safety cover safety switches are controlled by the safety module inside the electrical panel. The system permits the immediate stop of the machine if the operator opens the guard. It also prevents the machine from starting if the guard is not properly closed.



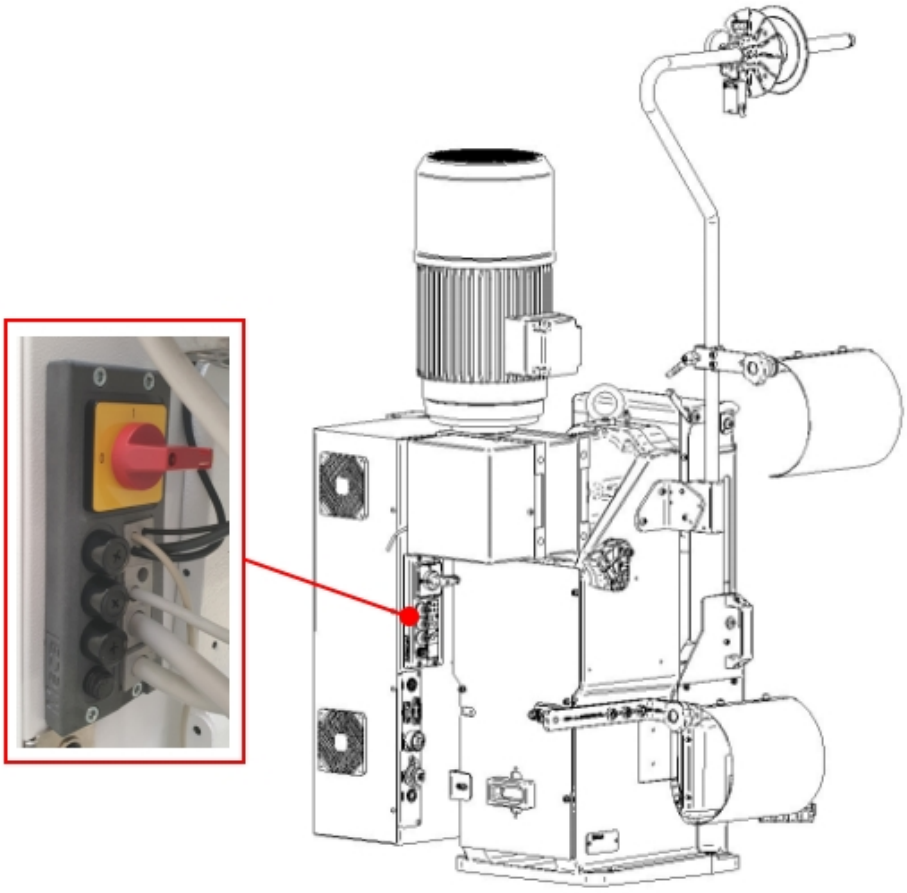
CAUTION

In case of maintenance, simply opening the guards is not enough to cut off power. The Manufacturer declines all responsibility in the event that the machine is operated with guards incomplete, open and/or not installed.

2.5.6 FUSES

Function: Cuts off power in case of overload or short circuit.

Features: The fuses are installed inside the fuse holders at the rear of the electrical panel. They intervene autonomously in the event of overloads or short circuits, interrupting the power supply to the circuits and stopping the machine immediately. The fuses must be replaced after they have been tripped.



2.5.7 FOOT PEDAL SAFETY SWITCHES

Function: Starts the work cycle.

Features: The foot pedal safety switch is a hold-to-run device. The system and the management logic allow machine movements to stop immediately after it is released. Any damage or breakage of the pedal is signalled by a system error.

2.6 PERSONAL PROTECTIVE EQUIPMENT (PPE)

Persons working on the machine must use personal protective equipment such as to minimise possible risks.

HAZARD

The clothing of those working or performing maintenance on the machine must comply with the essential safety requirements defined by the European community directives and by the laws in force in the country where the machine is installed.

HAZARD

During management and maintenance operations, personnel must wear suitable work clothing so as to prevent accidents from occurring.

To avoid mechanical risks, such as dragging, trapping or other, pull back hair and do not wear bracelets, watches, rings or necklaces.

2.7 RESIDUAL RISKS

2.7.1 GENERAL INFORMATION

All the areas and the parts at risk were evaluated during the design phase, and thus all the precautions necessary to avoid risks to people and damage to machine components have been taken.

NOTE

Periodically check the functionality of all safety devices.

Do not remove the protections present.

Do not insert foreign objects and/or tools into the work area of the machine.

2.7.2 RESIDUAL RISKS

After carefully considering all the possible risks related to the machine, all the solutions necessary have been adopted to eliminate the risks and limit the dangers for exposed persons.

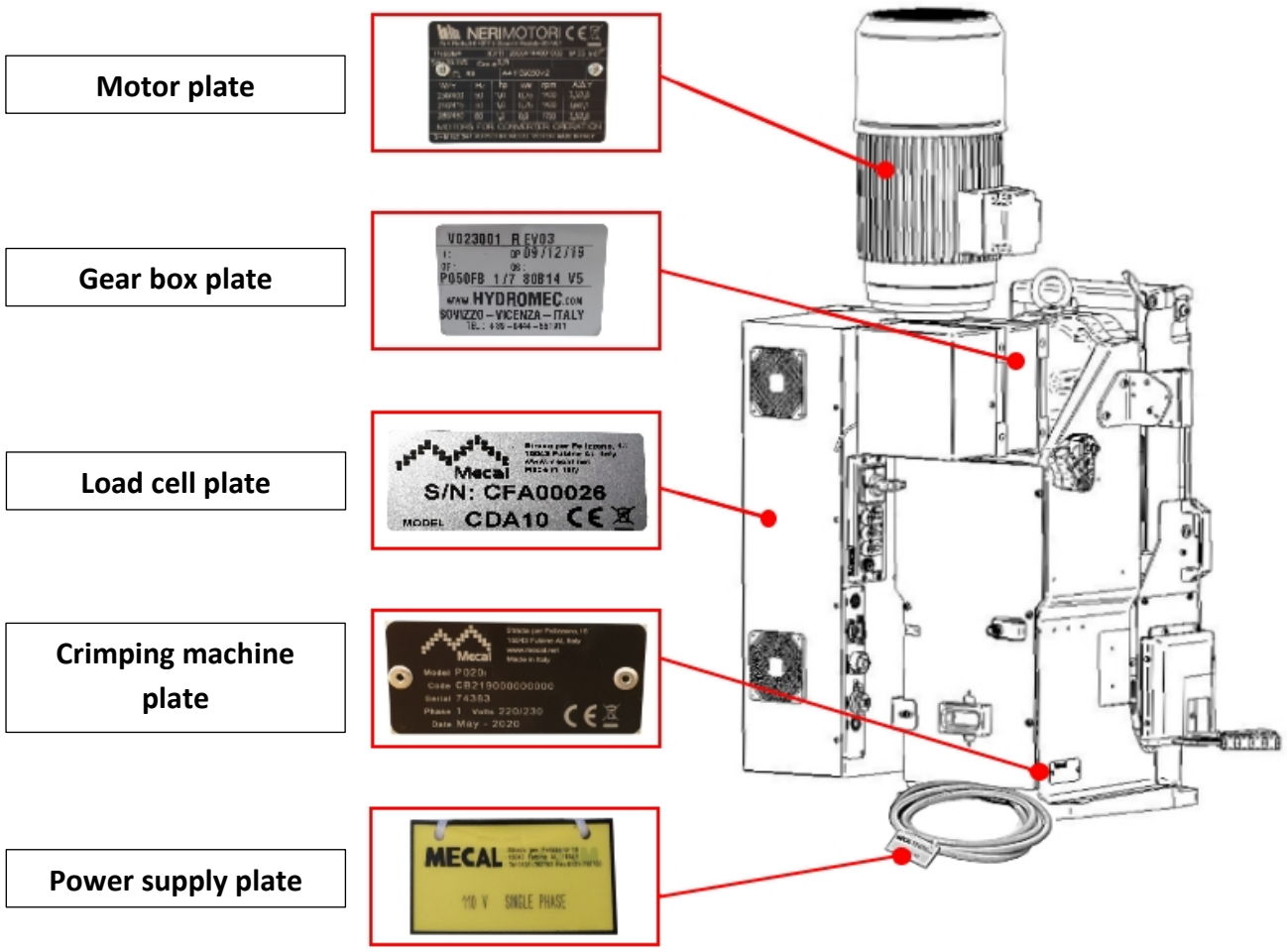
CAUTION

It is necessary to periodically check the regular operation of the safety devices as a precautionary measure for safety purposes.

Making any kind of modification is strictly prohibited, in order not to create additional dangers and consequent unforeseen risks.

2.7.3 PLATES PRESENT ON THE MACHINE

There are the plates present on the machine used to identify the installed components, as well as the plate of the device itself.



CAUTION

Removing the monitoring plates from the machine is strictly prohibited.

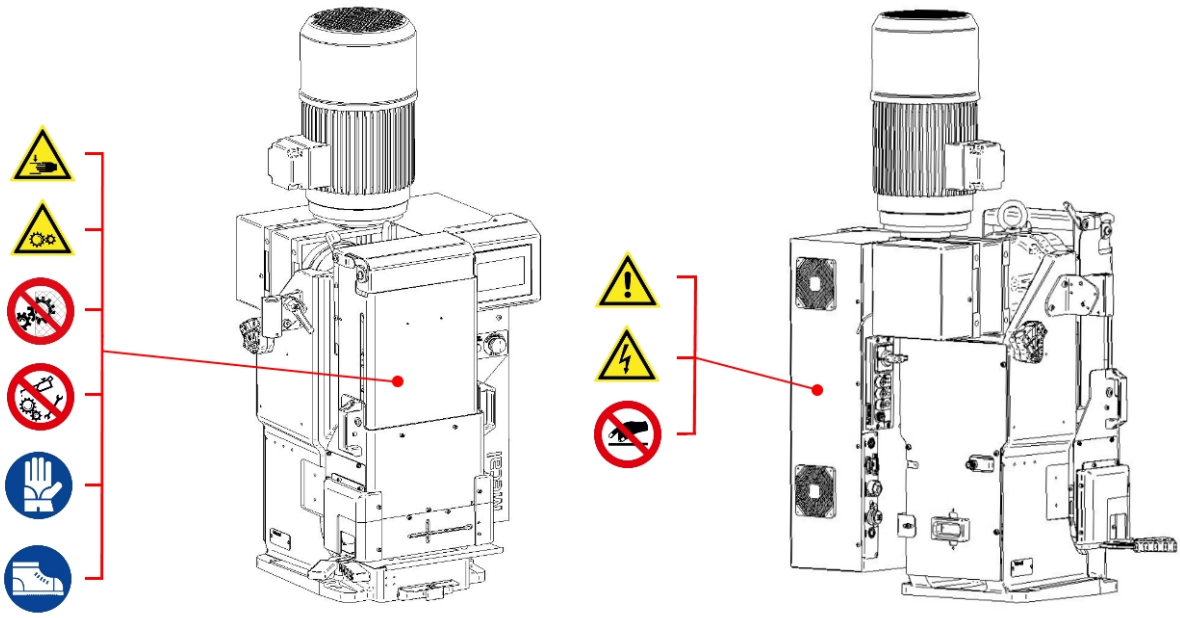
The Manufacturer declines all responsibility for the safety of the machine in the event of non-compliance with this prohibition.

Maintenance service must immediately replace any plates which have become illegible due.

2.7.4 WARNING PLATES PRESENT ON THE MACHINE

The Manufacturer has placed a series of monitoring plates on the machine, defined in accordance with European legislation regarding the graphic symbols to be used.

SYMBOL	MEANING
	General hazard
	Crushing hazard
	Danger of moving parts
	Electrical hazard
	Prohibition on the removal of protections and safety devices
	Prohibition on maintenance while parts are moving
	Prohibition on touching before disconnecting the power supply
	Obligation to wear protective gloves
	Obligation to wear protective footwear



CAUTION

Removing the monitoring plates from the machine is strictly prohibited.

The Manufacturer declines all responsibility for the safety of the machine in the event of non-compliance with this prohibition.

Maintenance service must immediately replace any plates which have become illegible due.

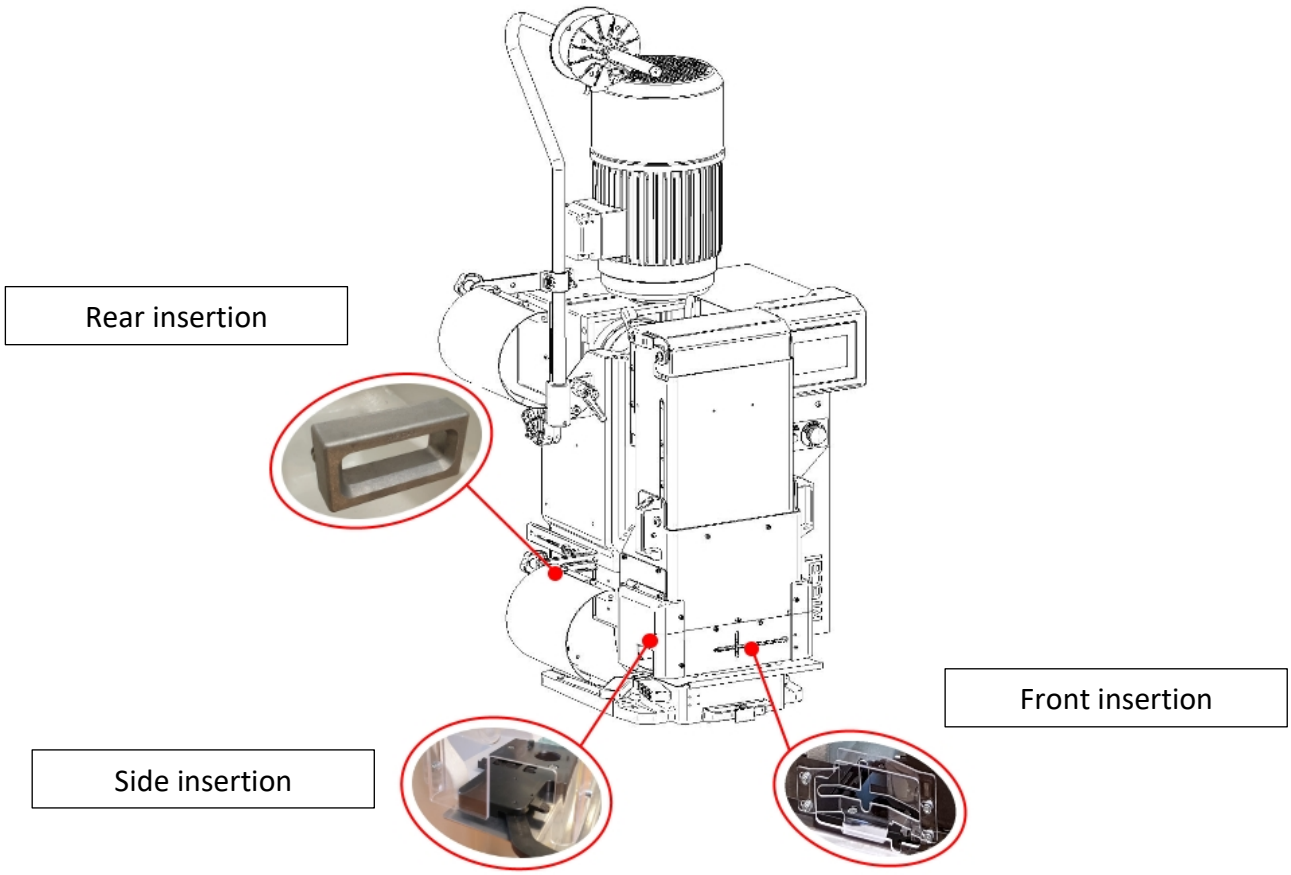
3. GENERAL DESCRIPTION

The machine has been designed and manufactured for the use of applicators suitable for cold crimping of terminals in ferrous materials. It can be used with applicators compatible with the following characteristics:

	P040i	P080i	P120i
Max Force exerted by the crimping machine	40 kN (8992 lbf)	80 kN (17985 lbf)	120 kN (26997 lbf)
Working height	135.8 ±0.02 mm (5.35 in) Miniapplicators and Magnum 212 ±0.02 mm (8.35 in) Die		
Strokes	20/25/30/35/40 mm (0.79 / 0.98 / 1.18 / 1.38 / 1.57 in)	30 / 35 mm (1.18/1.38 in) 40/50 mm (1.57/1.97 in)	40/50 mm (1.57/1.97 in)

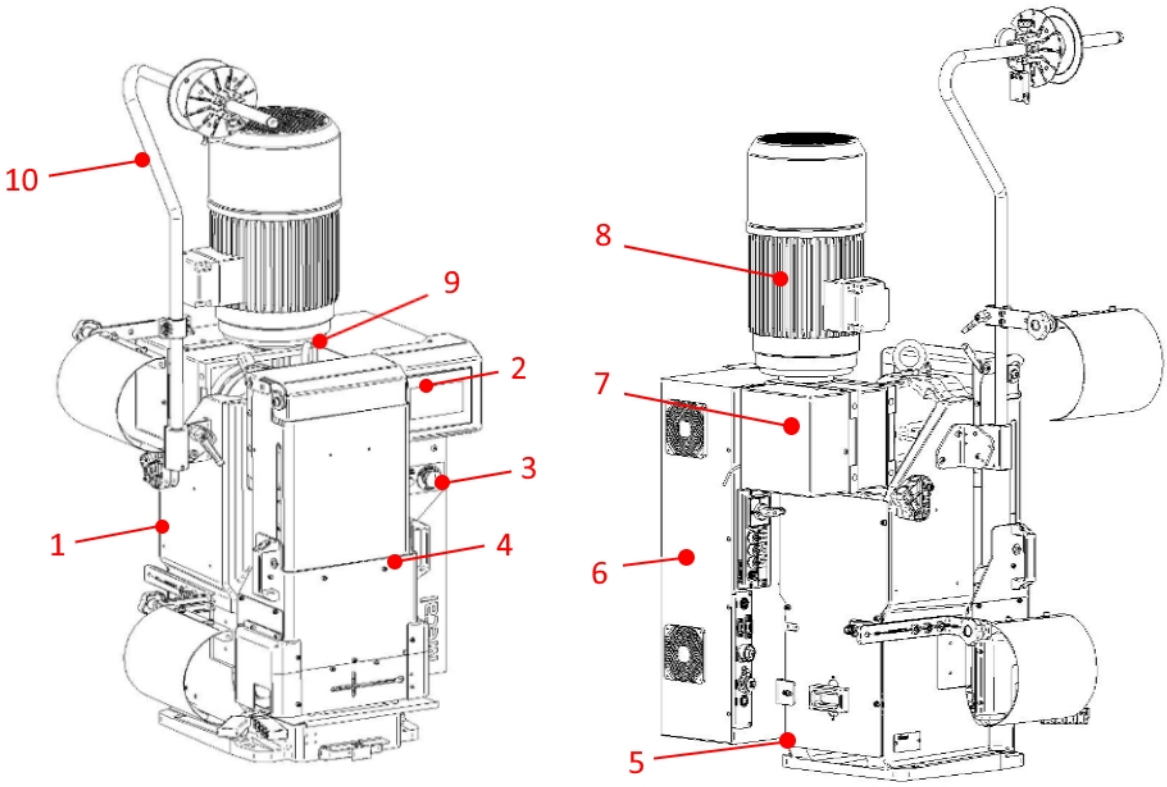
Restilyng, **Revolution**, **Magnum** and **MK** series Mecal applicators are compatible with the crimping machine. **MSAS**, **MSAP**, **MSMP** and **MFMP** series Mecal die are compatible with the crimping machine.

The methods of use of the machine can be carried out according to the different crimping operations: front, side, rear.

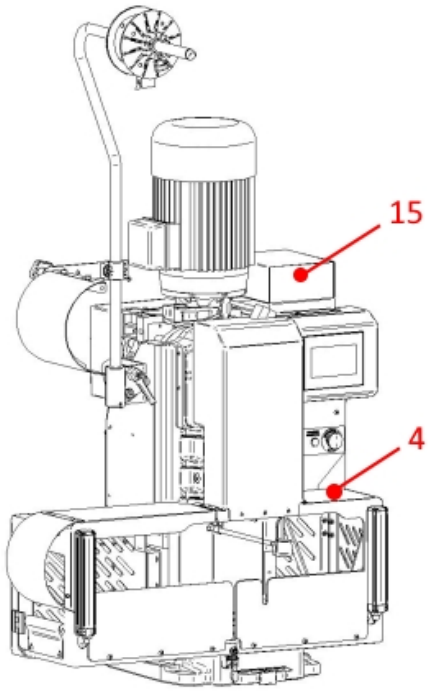


3.1 LAYOUT

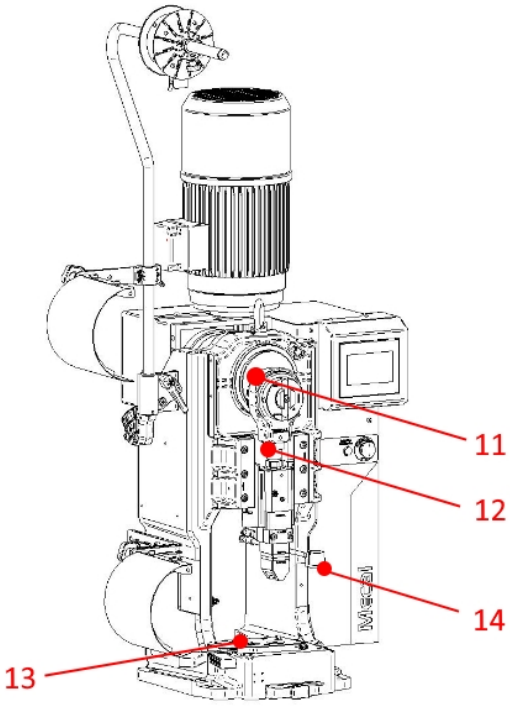
ITEM	DESCRIPTION
1	Crimping machine frame
2	Monitor
3	Control buttons
4	Protective safety cover
5	Rear protection
6	Electrical panel
7	Encoder
8	Motor and gear box
9	Lifting eyebolt
10	Reel support unit

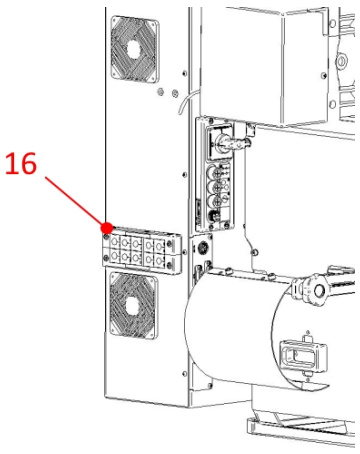


ITEM	DESCRIPTION
11	Shaft unit
12	Slide unit
13	Quick release baseplate
14	Adjustable lamp
15	Predisposition of external load cell (optional)
16	Predisposition for wiring passage (optional)



↑ Safety cover version with barriers





3.2 TECHNICAL FEATURES

The following table shows the main technical features of the machine.

3.2.1 P040i DATASHEET

P040i GENERAL TECHNICAL FEATURES	
Force	40 kN (8992 lbf)
Working height	135.8 ±0.02 mm (5.35 in) Applicators 212 ±0.02 mm (8.35 in) Dies
Stroke	30/25/30/35/40 mm (0.79/0.98/1.18/1.38/1.57 in)
Power	1.87 kW (2.5 hp)
Power supply	3x230 Vac 3x400 Vac
Voltage	230 - 400 - 500 Vac
Frequencies	50 / 60 Hz
Settable cycles	(A) Mode “A” (B) Mode “B” (C) Split-cycle
Functions	Jog Split-cycle
Connections	Ethernet Wi-Fi
Communication protocol	Modbus TCP IP
Monitor interface	HMI 4.3” colors
Dimensions	(See paragraph *9.1 – Layout*)
Weight	165 Kg (364 lb)
Degree of protection	IP40
Operating temperature	to +10 from +70 °C

NOTE: The features shown in the previous table may undergo variations; therefore, please see the attached diagrams for greater precision or verification of the machine features.

3.2.2 P080i DATASHEET

P080i GENERAL TECHNICAL FEATURES	
Force	80 kN (17985 lbf)
Working height	135.8 ±0.02 mm (5.35 in) Applicators 212 ±0.02 mm (8.35 in) Dies
Stroke	30/35 mm (1.18/1.38 in) 40/50 mm (1.57/1.97 in)
Power	4.2 kW (5.5 hp)
Power supply	3x230 Vac 3x400 Vac
Voltage	230 - 400 - 500 Vac
Frequencies	50 / 60 Hz
Settable cycles	(A) Mode “A” (B) Mode “B” (C) Split-cycle
Functions	Jog Split-cycle
Connections	Ethernet Wi-Fi
Communication protocol	Modbus TCP IP
Monitor interface	HMI 4.3” colors
Dimensions	(See paragraph *9.1 – Layout*)
Weight	165 Kg (364 lb)
Degree of protection	IP40
Operating temperature	to +10 from +70 °C

NOTE: The features shown in the previous table may undergo variations; therefore, please see the attached diagrams for greater precision or verification of the machine features.

3.2.3 P120i DATASHEET

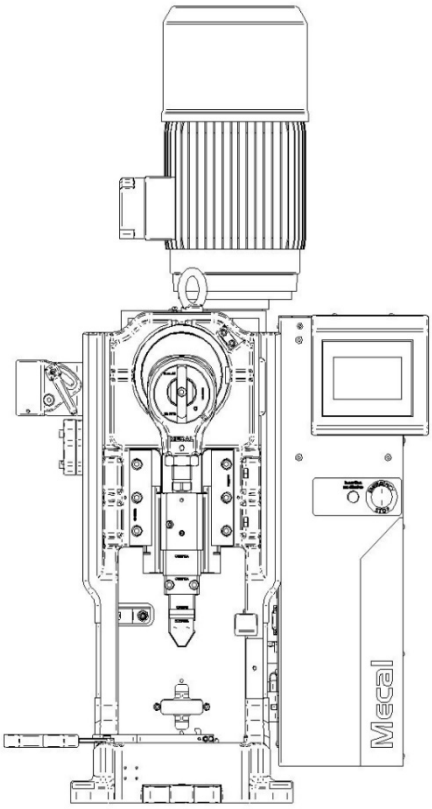
P120i GENERAL TECHNICAL FEATURES	
Force	120 kN (26977 lbf)
Working height	135.8 ±0.02 mm (5.35 in) Applicators 212 ±0.02 mm (8.35 in) Dies
Stroke	40/50 mm (1.57/1.97 in)
Power	4.2 kW (5.5 hp)
Power supply	3x230 Vac 3x400 Vac
Voltage	230 - 400 - 500 Vac
Frequencies	50 / 60 Hz
Settable cycles	(A) Mode “A” (B) Mode “B” (C) Split-cycle
Functions	Jog Split-cycle
Connections	Ethernet Wi-Fi
Communication protocol	Modbus TCP IP
Monitor interface	HMI 4.3” colors
Dimensions	(See paragraph *9.1 – Layout*)
Weight	165 Kg (364 lb)
Degree of protection	IP40
Operating temperature	to +10 from +70 °C

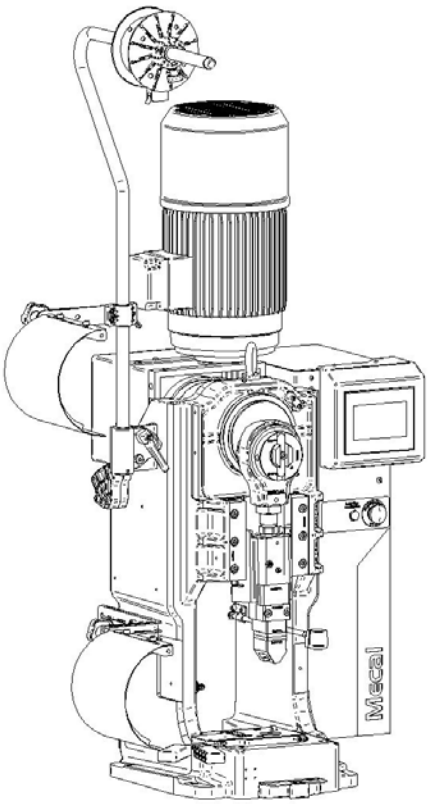
NOTE: The features shown in the previous table may undergo variations; therefore, please see the attached diagrams for greater precision or verification of the machine features.

3.3 DESCRIPTION OF UNITS

3.3.1 CRIMPING MACHINE FRAME

The set of parts that make up the crimping machine are installed on a painted steel frame. At the base is a quick release baseplate for applicator fixing, while at the upper part is the housing for the drive unit: the gear motor is fixed on the rear and the slide group on the front.





3.3.2 MONITOR

The monitor is installed on the right side of the machine, built into the structure. It is used to manage the crimping machine and monitoring of the processes.

3.3.3 CONTROL BUTTONS

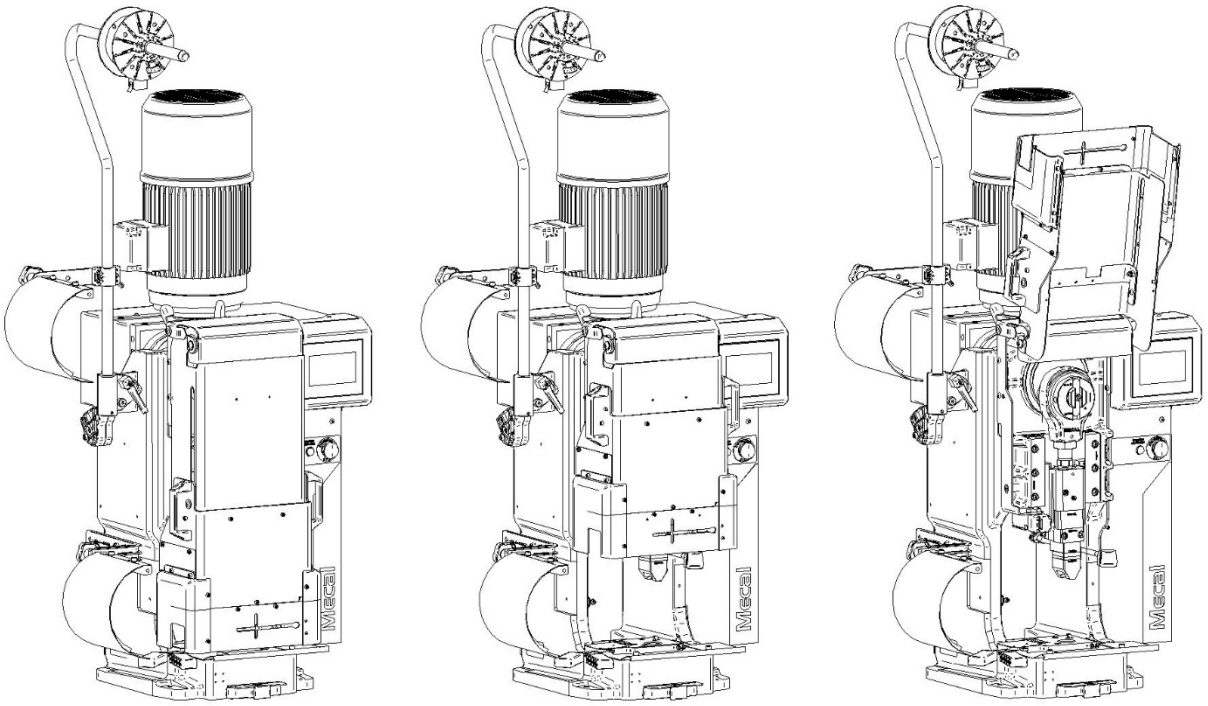
The machine emergency and start buttons are housed in a space on the front bottom right.

3.3.4 REEL SUPPORT UNIT

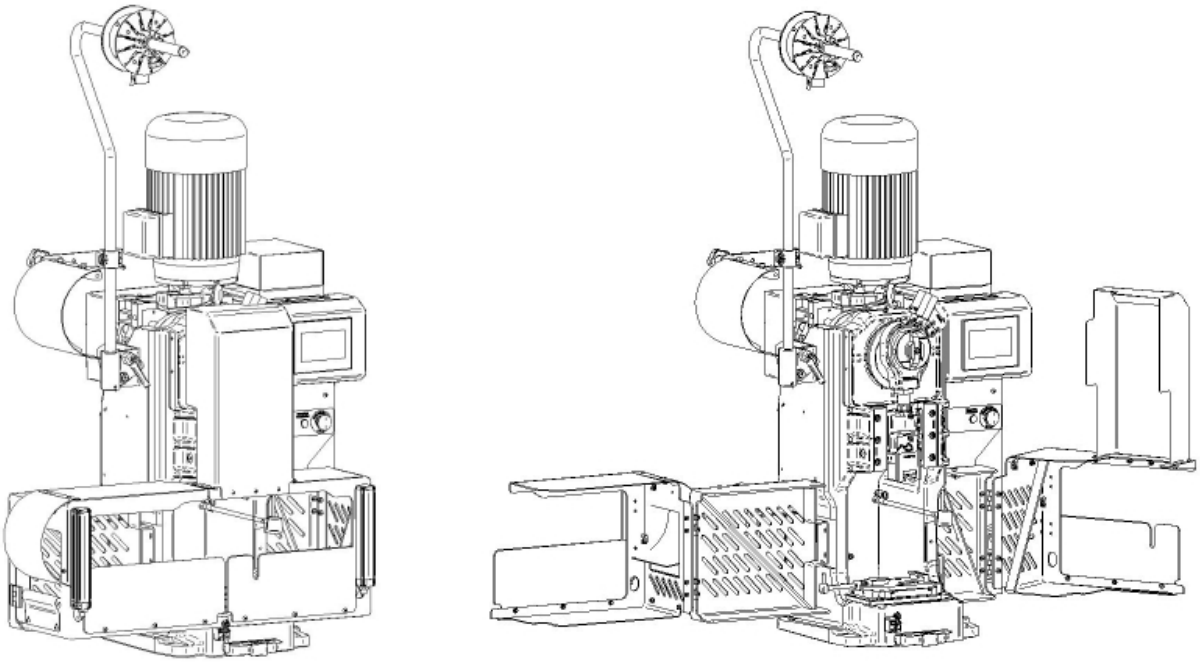
A plate which serves as a reel support and lifting point is anchored on the left side of the crimping machine. The unit is composed of an adjustable tilt rod. Reel centring with the applicator is carried out by adjusting the two flanges on the end of the rod.

3.3.5 PROTECTIVE SAFETY COVER

The front protection is composed of a main steel structure fixed to the crimping machine frame and a movable Lexan door. Both components are manually operated: the door slides upwards to allow access to the applicator, while the main structure tilts, allowing access to the slide unit for adjustments.



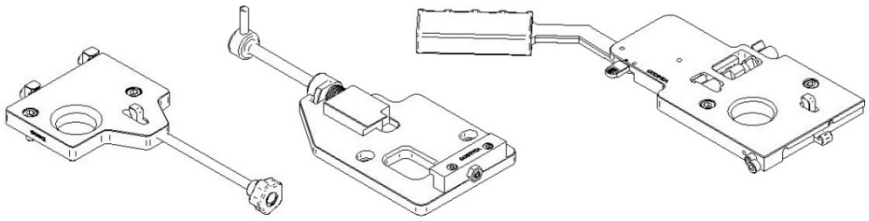
The safety cover version with barriers consists of two fixed parts anchored to the sides of the frame and two movable parts hinged to them. The stop for manual closing is placed on the front.



At the rear is a fixed Lexan protection that delimits access to the crimping area. There is an invitation present for the terminal on the protection itself.

3.3.6 APPLICATOR BRACKET BASEPLATE

Depending on need, the bracket baseplates can have a screw closure or have a system that allows quick release of the applicator.
There are baseplate models prepared for the installation of equipment (e.g. stripping units, scrap cable cutters, etc.).
In the case of installation of die it is necessary to remove the base present.

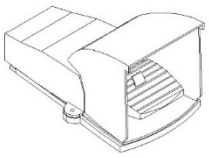


3.3.7 ENCODER

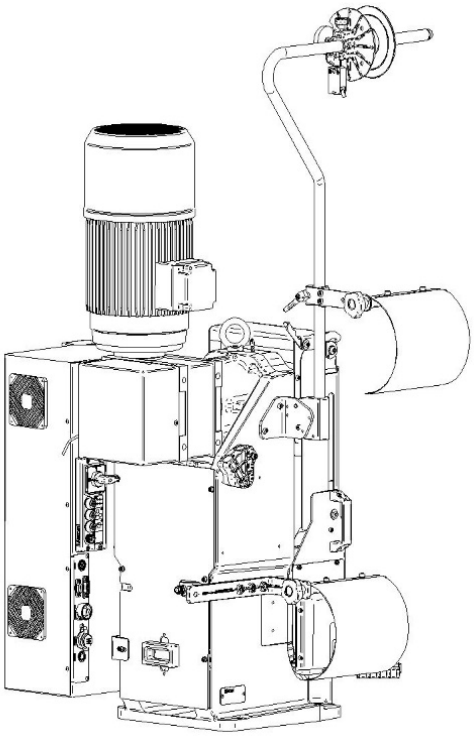
On the crimping machine versions where the CDA10 load cell is present, there is a sheet metal cover to protect the encoder connected to it. Removing the protection gives access to the device settings.

3.3.8 POWER SUPPLY, COMMAND AND CONTROL

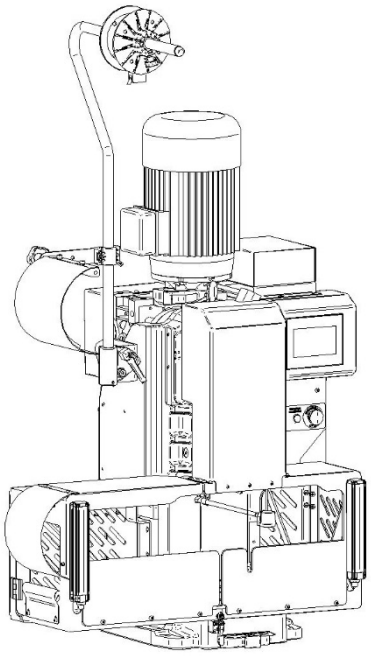
All electrical wiring is set inside the panel.
The padlockable switch, fuses, various connections and filters for electrical ventilation are located at the rear of the machine.



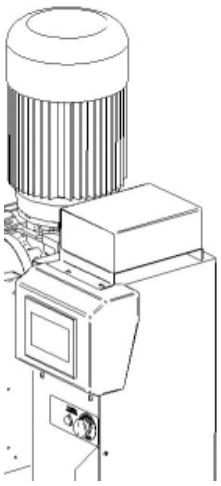
There is also a fitting for the pneumatic connection of the applicator on the rear right side. A foot pedal switch for starting the crimping machine cycle is positioned on the floor, at the front of the machine.



3.3.9 PREDISPOSITION OF EXTERNAL LOAD CELL

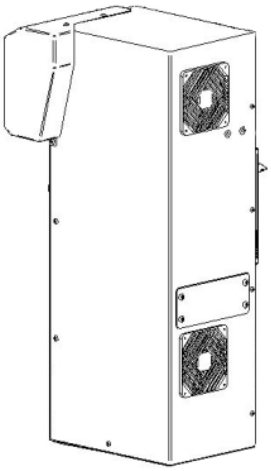


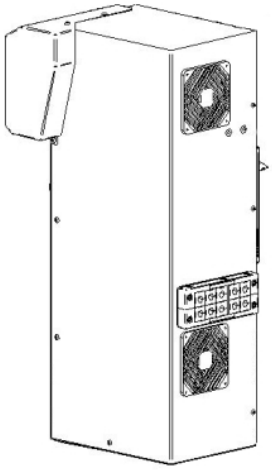
The crimping machine can be prepared for the installation of a third party load cell and host the control device mounted on a special fixing bracket, above the electrical box.

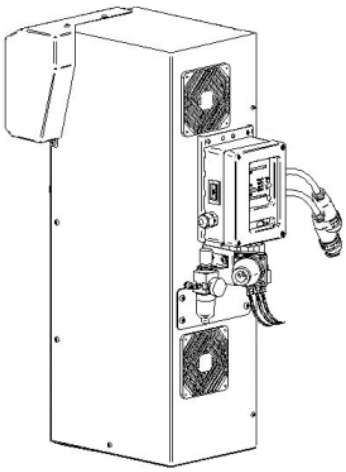


3.3.10 ACCESSORIES PREDISPOSITION

On the back of the electrical box there is a predisposition for the passage of cables, in the case of installation of accessories external to the machine. By removing the plate it is possible to replace it for the cable routing system.
It is also possible to fix an external Mecal control unit to the crimping machine, on the threaded holes on the back of the electrical box; this allows the use of previously purchased accessories.







4. PACKAGING AND TRANSPORT

4.1 PACKAGING

Unless otherwise indicated (i.e. sea transport), the packaging does not protect from external weather events such as rain, snow, hail, etc., even when the components are packed and transported in wooden crates. For this reason, if packaging remains exposed to the elements, it is essential that they remain in closed containers until they are finally stored.

All external parts subject to oxidation (machined surfaces, unpainted parts, etc.) are protected by a layer of protective antioxidant oil. The fragile parts are protected by plastic material to prevent damage during lifting and transport.

Example of packaging
Sea transport

Example of packaging
Air and/or ground transport

CAUTION

The load must always be kept in a vertical position.

Any multiple packages, and if indicated on the packaging, must not be stacked one on top of the other.

4.2 TRANSPORT

Depending on the destination, the machine can be shipped in the following ways.

- BY SEA → the various parts that make up the machine are enclosed in flat bottomed crates and anchored with tie rods. The crates are lined and have a door for customs checks. They also contain bags with desiccant salts against moisture and sea salt.
- BY AIR → the various parts that make up the machine are enclosed in flat bottomed crates and anchored with tie rods. The crates are lined and have a door for customs checks. They also contain bags with desiccant salts against moisture and other atmospheric agents.
- VIA GROUND→ transport via ground can be divided into two categories:
  - LONG DISTANCE TRANSPORT, where the various parts of the machinery are covered with protective sheets, enclosed in flat bottomed wooden creates and anchored with tie-rods on the loading surface of the articulated vehicle.

    Carefully follow the instructions printed on the outside of the packaging to lift the crates. Packaging can be recovered for possible re-use; therefore, it is good practice to try to keep them in a protected place in order to avoid damaging them and making them unreliable. If they have to be thrown out, it will be the responsibility of the Customer to dispose of them according to the regulations in force in their own country.

  - MEDIUM AND SHORT DISTANCE TRANSPORT, where each individual component of the machinery is fixed to a platform and covered with protective sheets.

    The anchorage points for lifting are indicated on the transport packages.

    All the indications for identification of the contents and for safe handling are also provided on the outside of the various packages:

    - ✓ Address of recipient and sender
    - ✓ Dimensions (length, width, height)
    - ✓ Gross, net and tare weight
    - ✓ Centre of gravity
    - ✓ Annotations and pictograms (i.e. fragile, tall, etc.).
    - ✓ Packing list plate (a copy must be present inside each package).

4.3 LIFTING AND HANDLING

You must know the weight of the machine before performing any handling and/or lifting.

CAUTION

All handling and/or lifting operations must be carried out by qualified personnel, aware of the standards regarding the lifting and handling of loads, and in full compliance with them.

CAUTION

Use a suitable lifting device, adequate for the weight and the encumbrance of the load to be handled.

CAUTION

Always ensure correct balancing of the load. If it is unbalanced, immediately place it on the ground and reposition it.

CAUTION

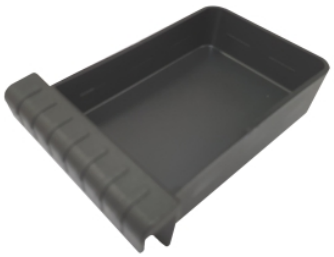
When the load is lifted to a height greater than 50 cm, the operators must remain at a safe distance from the perimeter, greater than 2m.

A break in the slings or an uncontrolled movement of the load are in fact serious dangers to personnel safety.

4.3.1 PARTS COMPLEMENTARY TO THE MACHINE

In addition to delivery of the machine, the manufacturer provides the following components:

- WR32 open end wrench [only for P040i machine]
- WR32 open end wrench [only for P080i and P120i machines]
- Waste recovery tray



4.3.2 WEIGHT OF PACKAGES

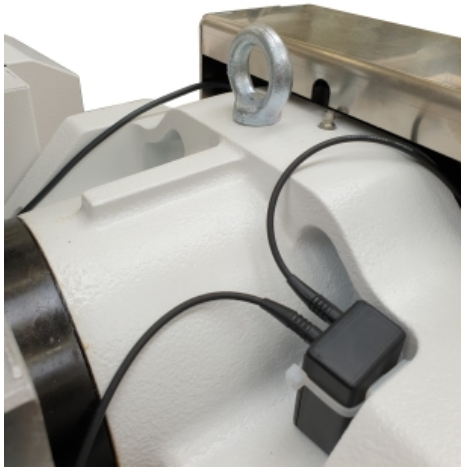
Description	P040i Weight	P080i Weight	P120i Weight
Complete machine	165 Kg. (364 lb)	165 Kg. (364 lb)	165 Kg. (364 lb)
➢ Structure	150 Kg. (331 lb)	150 Kg. (331 lb)	150 Kg. (331 lb)
➢ Terminal reel support	10 Kg. (22 lb)	10 Kg. (22 lb)	10 Kg. (22 lb)
➢ Accessories	5 Kg. (11 lb)	5 Kg. (11 lb)	5 Kg. (11 lb)

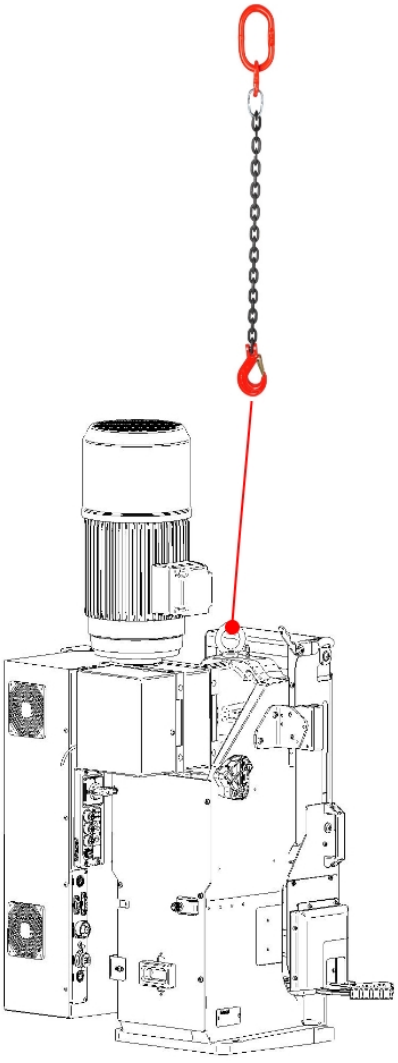
4.3.3 MACHINE LIFTING WITH A HOOK

Il sollevamento ed il trasporto della macchina tramite carroponte va eseguito come da istruzioni seguenti:

The lifting and transport of the machine by overhead crane must be carried out according to the following instructions:

- Secure the machine properly using the eyebolt shown.
- Hook the straps to the hook of the lifting equipment.
- Lift the load slowly, avoiding sudden movements.
- Carry the load as close to the ground as possible.
- Once you have reached your destination, make sure the support point is solid and stable.
- Lower the load slowly and gradually.
- Remove the bands only after checking that the load is resting perfectly on the ground or on the workbench.





5. INSTALLATION

Before installing the machine:

- Remove the protective packaging of the various parts that make up the machine.
- Remove any fasteners used for transportation.

5.1 MACHINE INSTALLATION

5.1.1 GENERAL SAFETY PRECAUTIONS

The operations described in this paragraph must be performed by authorised personnel. Unauthorised personnel must remain outside the installation area.

HAZARD

Make sure there is nothing around during installation of the various parts that make up the machine (cables, pipes, etc.) that could cause interference or danger to operators.

CAUTION

Personnel in charge of all installation, connection, checks and verifications must be trained to avoid incorrect operations that could damage the machine.

ADDITIONAL INFORMATION

See the specific manuals for information on the integrated devices.

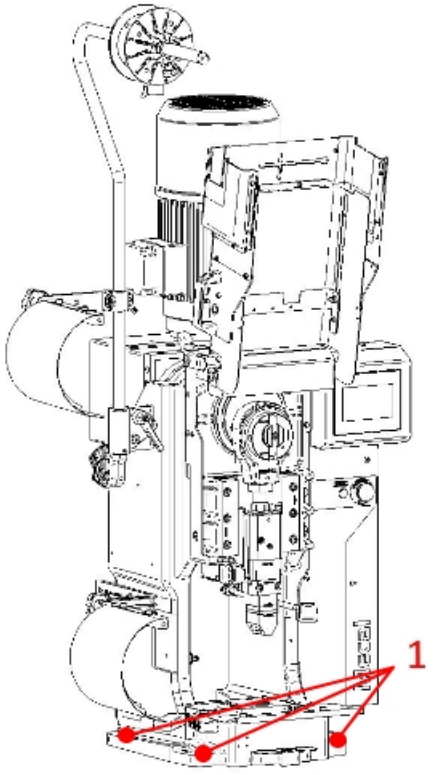
5.1.2 CHOOSING THE SITE AND VERIFYING INSTALLATION REQUIREMENTS

The customer MUST prepare:

- A sufficiently large room, free from obstacles, equipped according to the safety regulations in force in the user country.
- Proper ventilation and lighting
- Appropriate lifting means
- Operating spaces
- Transit routes
- Escape routes
- Flooring capable of supporting the weight of the machine
- A general power supply, including the earthing conductor, according to the characteristics and tolerances required
- A pneumatic supply, according to the characteristics and tolerances required.

5.1.3 POSITIONING AND SECURING THE MACHINE

See the attached layout to position the machine.
Then check the correct levelling of the machine, positioning a spirit level on the base of the applicator, both longitudinally and transversely. Then, if necessary, adjust the support bench until the correct position and stability of the crimping machine is achieved.
The frame can be fixed using the three holes present ①.



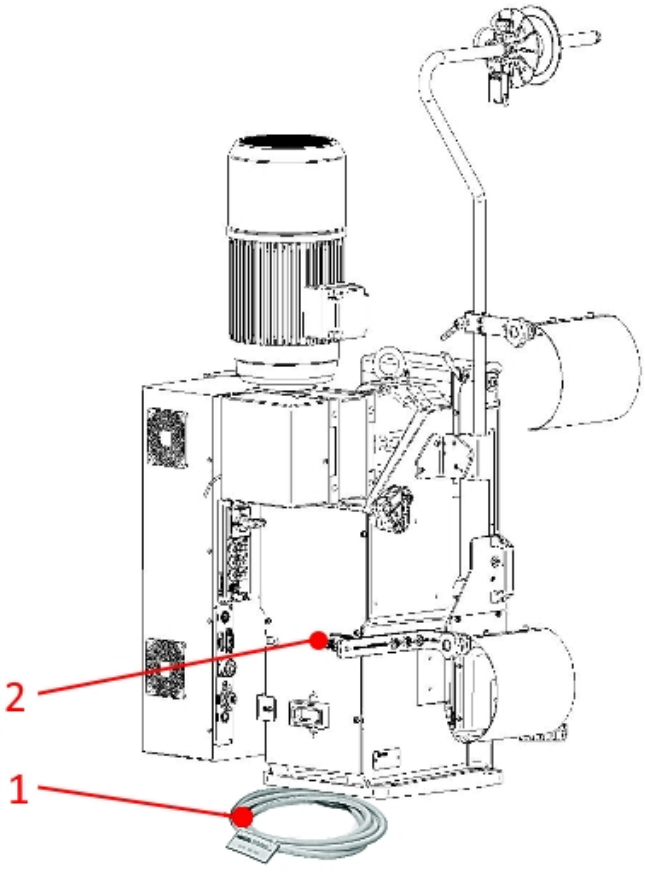
5.2 CONNECTIONS

The machine must have the following connections:

- Electrical ①
- Pneumatic ② (if a pneumatic applicator is installed).

HAZARD

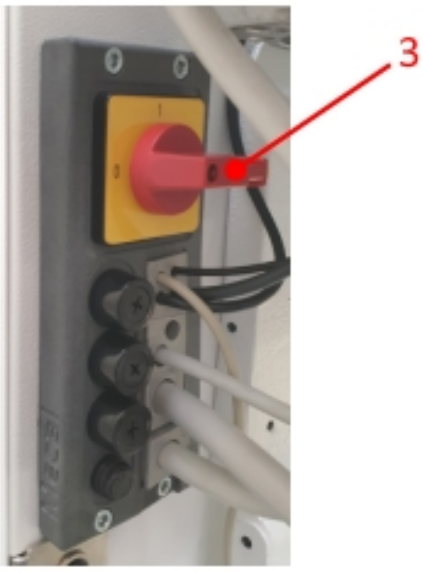
Machine power supply connection operations must be carried out solely by specialised personnel and are subject to use of personal protective equipment.



5.2.1 CONNECTING TO THE ELECTRICAL MAINS

Before making any electrical connections:

- Make sure the main switch of the power distribution line is in the OFF (O) position and lock it.
- Check that the switch ③, located on the electrical panel, is in the OFF (O) position.
- Make sure that the line voltage corresponds to the voltage indicated on the technical specifications plate and/or on the plate applied to the electrical cable of the crimping machine and/or on the attached wiring diagram.
- First, connect the ground wire.
- Connect the power cables.
- Move the main switch to the ON position (I).
- Move the disconnecting switch ③ to the ON position (I).



HAZARD

Make sure that the electrical distribution line is sized according to the machine load.

Make the connection to the earthing system and to the equipotential protection circuit before any other connection to the electrical distribution line.

ADDITIONAL INFORMATION

For more information about the system, please refer to the attached wiring diagram.

5.2.2 CONNECTING TO THE PNEUMATIC NETWORK

The crimping machine is equipped with a 1/8" coupling ④, on which the pneumatic supply coming from the line is to be connected. Inside the working area is a quick coupling female ⑤and male ⑥for the Ø6 pipe, on which the applicator can be connected to the system.
The applicators usually require air pressure at a nominal value of 6 Bar [0.6 MPa / 87 psi], while some types require different working pressures, so refer to the use and maintenance manual of the device.

CAUTION

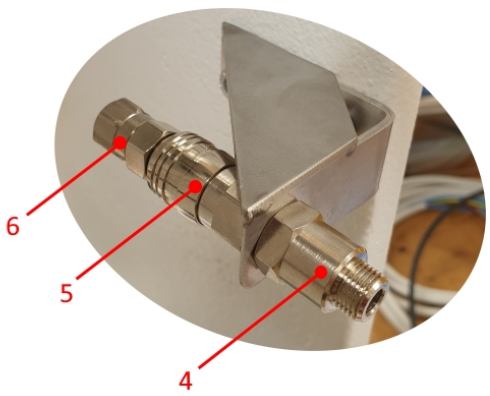
The air, destined for the machine and / or the applicator and deriving from the line, must be treated by a F.R.L. and result in **dry air**.

Before making any pneumatic connections:

- Check the operating pressure of the applicator to be installed.
- Check that the pneumatic supply line is capable of delivering compressed air at a constant pressure required by the applicator.
- Check the conditions of all distribution pipe connections and that they are properly connected and secured.
- Make sure that an air handling unit is installed upstream and that its tap is closed.

HAZARD

Uncontrolled actuator movements can occur when pneumatic energy is applied. It is therefore important to make sure that no person is present in the danger zone upon installation.



CAUTION

Any drop in pressure not caused by manual intervention or drops in the line supply can be caused by leakage, clogging or component failure.

Connecting to the pneumatic network:

- Connect the Ø6 pipe from the applicator to the quick coupling ⑥ inside the work area.
- Connect the pipe to the 1/8” sleeve ④ on the back of the crimping machine.
- Open the main tap from which the system will take power.
- Open the tap upstream of the air handling unit.
- Check the outlet pressure from the air handling unit.

CAUTION

Periodically check the condensate recovery cup and empty it by pressing on the appropriate valve or unscrewing the drain tap.

ADDITIONAL INFORMATION

For more information about the system, please refer to the pneumatic diagram of the applicator to be installed on the crimping machine.

ADDITIONAL INFORMATION

For further information on applicator installation, see paragraph *6.5.3 – Applicator installation*.

5.3 CHECKS AND VERIFICATIONS

Before starting the machine, carry out a series of checks and verifications in order to avoid problems during its operation.

CAUTION

Before making any movement, make sure that there are no faults in order to avoid damage to the machine. Before cancelling any faults, check the cause and eliminate it.

5.3.1 GENERAL CHECKS ON THE MECHANICAL UNITS

HAZARD

These checks and verifications must be carried out with the machine stopped and with all energy sources deactivated.

- Perform a general visual inspection of the various units making up the machine, making sure that there are no particular mechanical faults or foreign bodies.
- Check that the machine parts and its guards have been properly anchored.
- Verify that the handling parts are properly lubricated if they need to be.

NOTE

Contact the Manufacturer immediately if any problems are detected.

CAUTION

Insulate the power cables by channelling them and divide them from the signal cables to avoid electromagnetic interference. Follow the reference standards.

5.3.1.1 CHECKING CRIMPING MACHINE CALIBRATION

Check the working height of the crimping machine with the appropriate calibration tool.

Depending on need, there are manual or automatic calibration verification instruments (PAL 3001 or PAL 4000) that allow CMK tests to be carried out on the crimping machine.

CAUTION

Verification of the correct calibration height of the crimping machine at the bottom dead centre BDC is a very important operation for the correct functioning of the machine itself and the equipment installed on-board.

ADDITIONAL INFORMATION

Always refer to the use and maintenance manual of the equipment to be installed on the crimping machine and on the control instruments used.

HAZARD

These checks and verifications must be carried out with the machine stopped and with all energy sources deactivated.

Check the machine data sheet. The working height must be **135.8mm ±0.02mm** or **212mm ±0.02mm**, depending on whether it is used with applicators or dies.

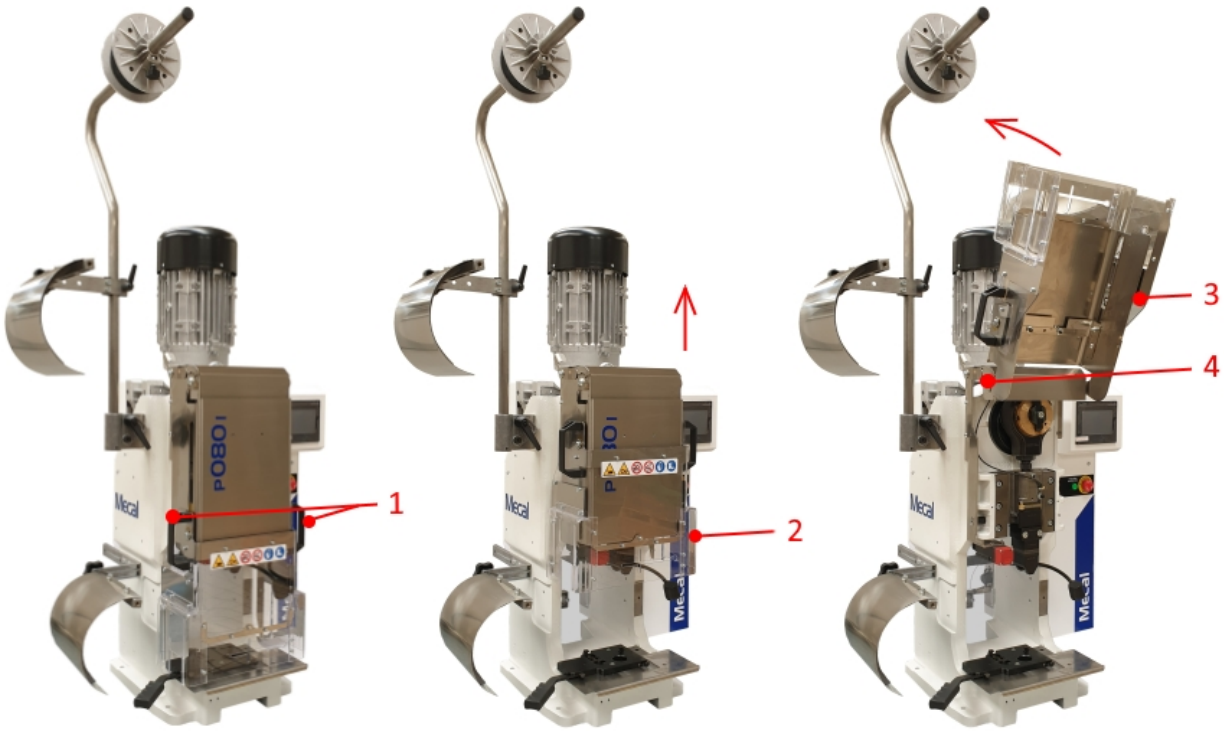
Calibration tools
PAL 3001 – Code 870380092
PAL 4000 – Code 870380144

Calibration tool for 135.8 mm working height
Code 871710000
Spacer for 212mm working height
Code 991400003

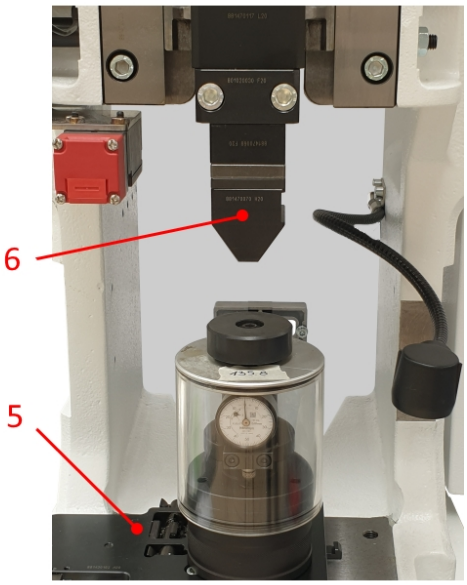
5.3.1.1.1 CHECKING CALIBRATION WITH TILTABLE SAFETY COVER

Procedure to check the working height:

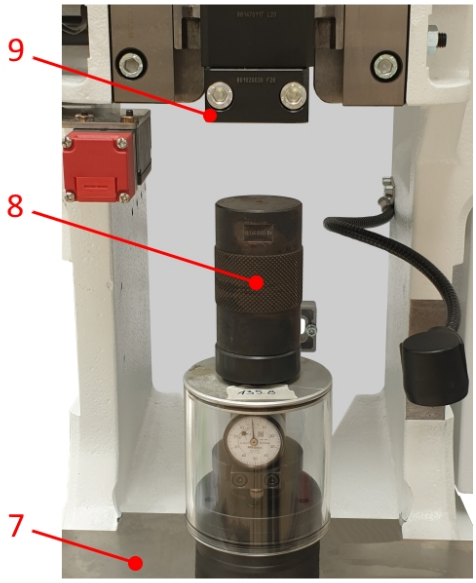
- Access the work area: lift the handles ① of the safety cover with both hands to open the movable Lexan door ②; then turn the steel safety cover ③ until the locking hook is engaged ④.
  For detailed information, see paragraph *6.4.2 – Opening and closing the movable guard*.



- Place the calibration tool on the baseplate ⑤ and under the "T" connection ⑥ <u>if the working height is 135.8mm (5.35 in), for use with an applicator</u>.
  Place the calibration tool on the protective plate ⑦ at the base and the spacer ⑧ over the tool and under the shank ⑨ (the "T" connection must be removed: for detailed information, see paragraph *8.5.2 – Changing working heights*) <u>if the working height is 212mm (8.35 in), for use with a die</u>.



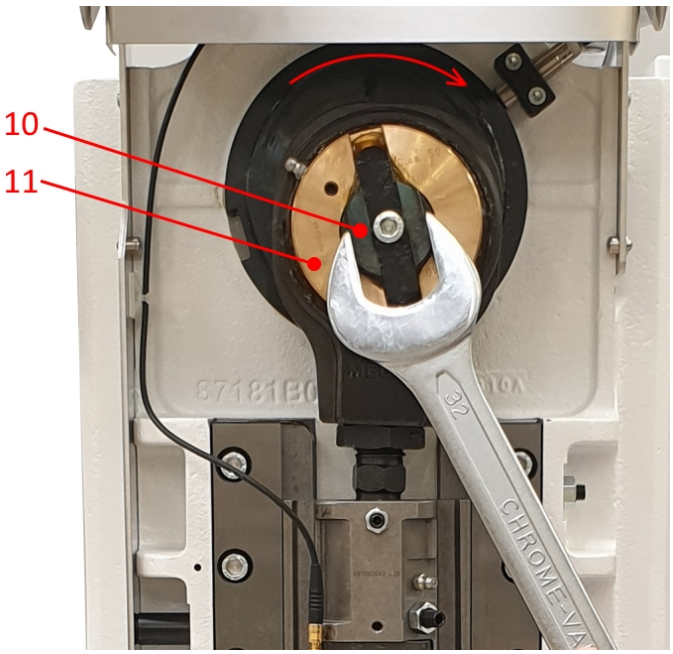
Calibration height 135.8 mm (5.35 in). → For Miniapplicator installation



← Calibration height 212 mm (8.35 in) for die installation.

"T" connection to be removed for crimping machine use at working height 212mm (8.35 in).

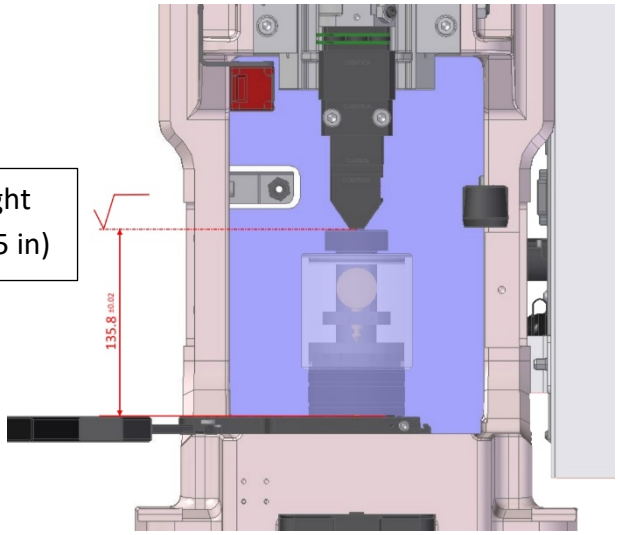
- Using the housing on the drive shaft ⑩ with the appropriate open-end wrench, turn the crank ⑪ clockwise until the slide unit is moved downward and attach to the lower dead centre [BDC].



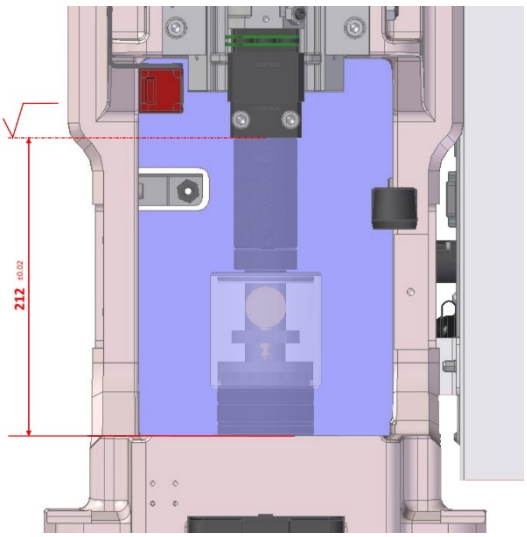
- Detect the height deviation on the comparator of the tool [the big pointer will have to make a complete turn, repositioning on "0", while the small pointer will have to pass from "2" to "1", i.e. mark the deviation of 1mm].

If the deviation value is different from the reference value, it is necessary to proceed with calibration at 135.80mm ±0.02mm, and then follow the procedure for calibration in paragraph *8.5.1 - Adjusting the working height of the crimping machine*.

Working height
135.8mm (5.35 in)



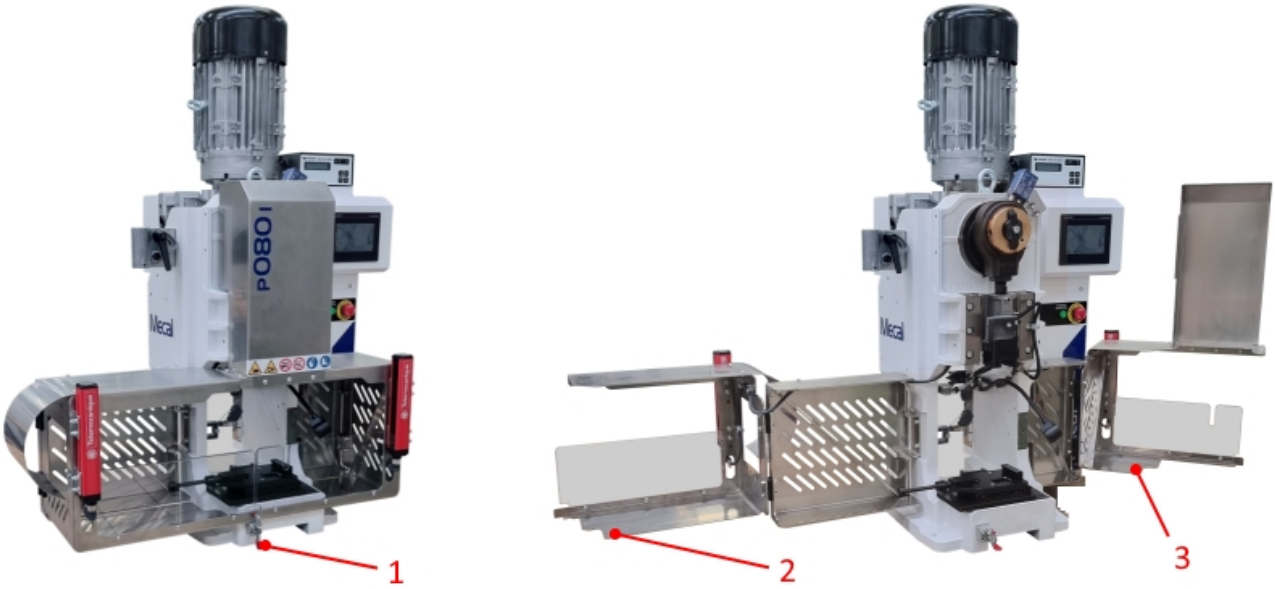
Working height
212mm (8.35 in)



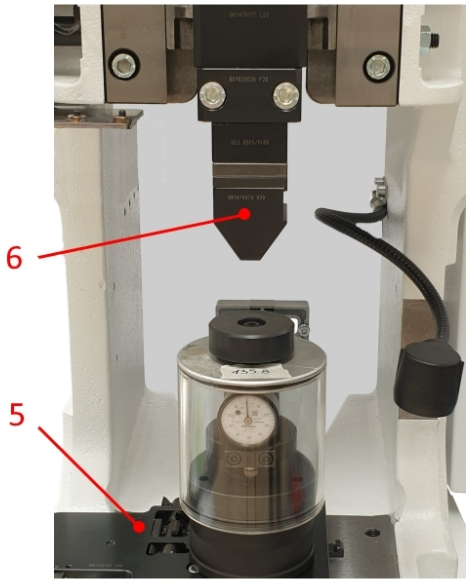
5.3.1.1.2 CHECKING CALIBRATION WITH SAFETY COVER WITH BARRIERS

Procedure to check the working height:

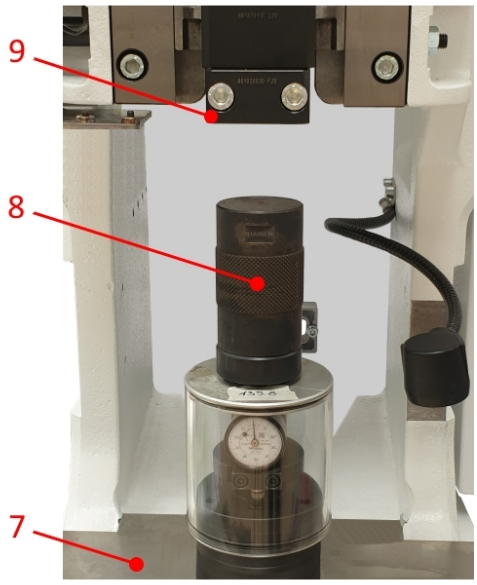
- Access the work area: Act on the protection closing presser ①, lifting the red lever unlocks the left door ② and consequently the right door ③.
  For detailed information, see paragraph *6.4.2 – Opening and closing the movable guard*.



- Place the calibration tool on the baseplate ⑤ and under the "T" connection ⑥ <u>if the working height is 135.8mm (5.35 in), for use with an applicator</u>.
  Place the calibration tool on the protective plate ⑦ at the base and the spacer ⑧ over the tool and under the shank ⑨ (the "T" connection must be removed: for detailed information, see paragraph *8.5.2 – Changing working heights*) <u>if the working height is 212mm (8.35 in), for use with a die</u>.



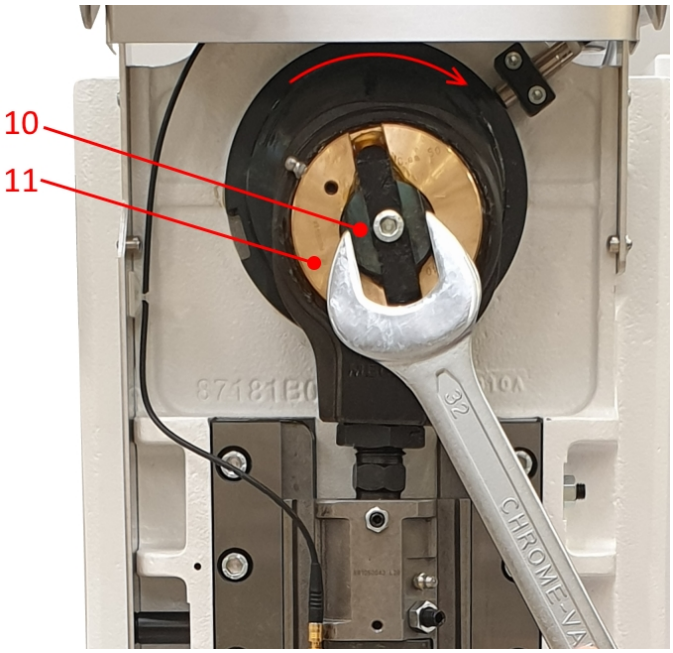
Calibration height 135.8 mm (5.35 in). → For Miniapplicator installation



← Calibration height 212 mm (8.35 in) for die installation.

"T" connection to be removed for crimping machine use at working height 212mm (8.35 in).

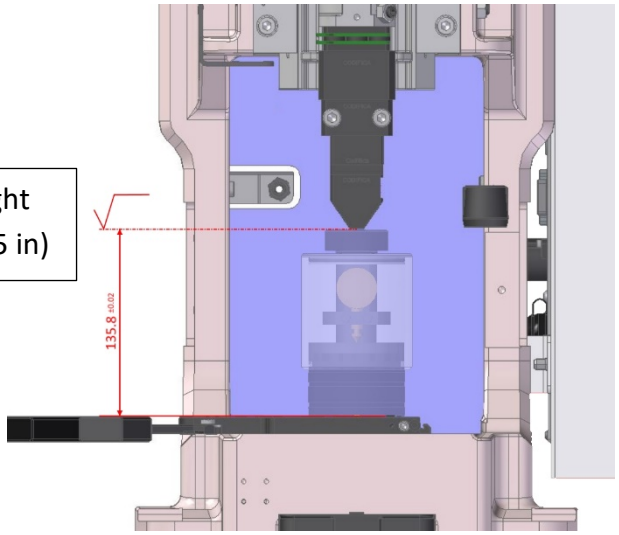
- Using the housing on the drive shaft ⑩ with the appropriate wrench, turn the crank ⑪ clockwise until the slide unit is moved downward and attach to the lower dead centre [BDC].



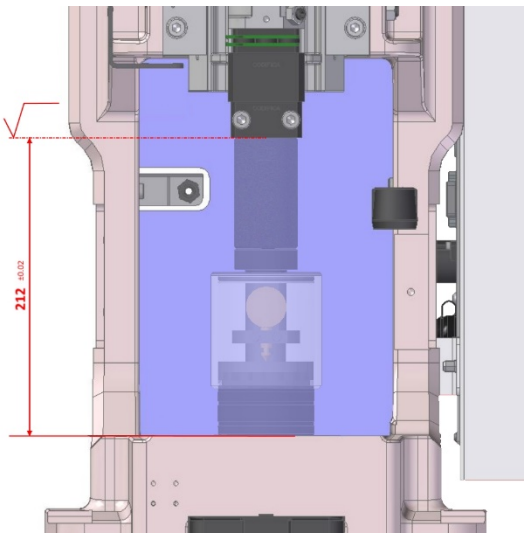
- Detect the height deviation on the comparator of the tool [the big pointer will have to make a complete turn, repositioning on "0", while the small pointer will have to pass from "2" to "1", i.e. mark the deviation of 1mm].

If the deviation value is different from the reference value, it is necessary to proceed with calibration at 135.80mm ±0.02mm, and then follow the procedure for calibration in paragraph *8.5.1 - Adjusting the working height of the crimping machine.*

Working height
135.8mm (5.35 in)



Working height
212mm (8.35 in)



5.3.2 ELECTRICAL SYSTEM CHECKS

Proceed with a general check of the electrical system, in particular:

1. Check that all cables are connected and secured.
2. Check the grounding of the system.
3. Perform the power insertion test and check the power and voltage distribution to the auxiliary circuits.
4. Verify the correct connection of the interconnections between the electrical panel and peripherals (complementary to the machine).
5. Verify the correct operation of:
   - Buttons and Selector switches
   - Foot pedal switch
   - Indicator Lights
   - Acoustic warning devices.
6. Check the correct position and fixing of the foot pedal switch, if present.

ADDITIONAL INFORMATION

For more information about the system, please refer to the attached wiring diagram.

5.3.3 PNEUMATIC SYSTEM CHECKS

Proceed with a general check of the pneumatic system, in particular:

1. Check that the fittings are tightened correctly.
2. Check that all the piping is connected to the respective fittings and that they do not have any corners that are too tight, causing the system to choke.
3. Verify that the pressure value, indicated on the air handling unit pressure gauge, is that indicated by the technical specifications of the applicator used.

ADDITIONAL INFORMATION

For more information about the system, please refer to the attached pneumatic diagram.

5.3.4 SAFETY SYSTEM CHECKS

Proceed with a general check of the safety circuits:

1. Verify the correct operation of the safety cover switch.
2. Verify the correct operation of the emergency circuits:
   - Emergency push-button
3. Check that all guards on the casing are correctly installed and working.

HAZARD

The safety of the machine is not guaranteed in the event of tampering and/or removal of safety devices.

ADDITIONAL INFORMATION

For more information about the safety system, please refer to the attached wiring diagram.

5.4 UNIVERSAL INTERNATIONAL RECYCLING CODES FOLLOWING INSTALLATION

Following the removal of machine packaging and its installation, remove the packaging from the area surrounding the machine and dispose of it in accordance with the regulations in force. The international recycling codes are indicated below.

Simbol	Code	Description
		Plastics
	#1 PET o PETE	Polyethylene Terephthalate or Arnite: water bottles, drink bottles, shampoo bottles.
	#2 HDPE	High density polyethylene: yogurt container, detergent bottles.
	#3 PVC o V	Polyvinyl Chloride: food containers.
	#4 LDPE	Low density polyethylene: frost bags, squeezable bottles.
	#5 PP	Polypropylene or Moplen: bottles.
	#6 PS	Polystyrene or Polystyrene: disposable glasses.
	#7-#19 O	All other plastics.
		Paper
	#20 PAP	Corrugated cardboard: boxes.
	#21 PAP	Non-corrugated cardboard: food packaging.
	#22 PAP	Paper: food packaging, newspaper, paper bags.
	#23-#39	All other paper.
		Metallic materials
	#40 FE	Steel
	#41 ALU	Aluminum: cans.
	#42-#49	All other metallic materials

Simbol	Code	Description
		Wood Materials
	#50 FOR	Wood.
	#51 FOR	Cork.
	#52-#59	All other wood materials.
		Textiles
	#60 TEX	Cotton.
	#61 TEX	Jute.
	#60-69	All other textile materials.
		Glass
	#70	Clear glasses, colorless glasses: water bottles.
	#71	Green glasses: wine bottles.
	#72	Brown glasses: beer bottles.
	#73-79	All other glasses materials.
		Composite materials
	#80	Paper and cardboard / Various metals.
	#81	Paper and cardboard / Plastic.
	#82	Paper and cardboard / Aluminum.
	#83	Paper and cardboard / Tin.
	#84	Paper and cardboard / Plastic / Aluminum.
	#85	Paper and cardboard / Plastic / Aluminum / Tin.
	#86-#89	All other composite materials.
	#90	Plastic / Aluminum.
	#91	Plastic / Tin.
	#92	Plastic / All other metallic materials.
	#93-#94	All other composite materials.
	#95	Glass / Plastic.
	#96	Glass / Aluminum.
	#97	Glass / Tin.
	#98	Glass / Various metals.
	#99	All other composite materials.

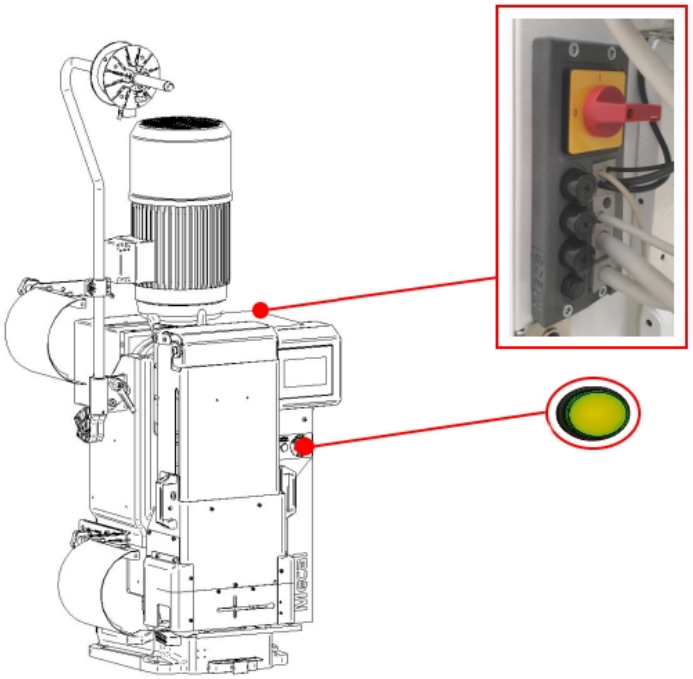
6. USE

6.1 GENERAL CIRCUIT BREAKER

There is a padlockable power switch on the rear of the crimping machine, above the electrical panel and an auxiliary power switch button/lamp on the front.

The disconnecting switch has two positions:

- OFF (O) position, where the power supply is interrupted and the auxiliaries indicator light is off.
- ON position (I), in which the power supply is switched on and the indicator light is lit and flashing green.



6.2 ELECTRICAL CIRCUIT

The machine is designed to operate and manage the crimping cycle according to user needs and coordinates the movement of the actuators present. This operation is managed by the electronics inside the electrical panel and the plant engineering on-board the machine.

NOTE

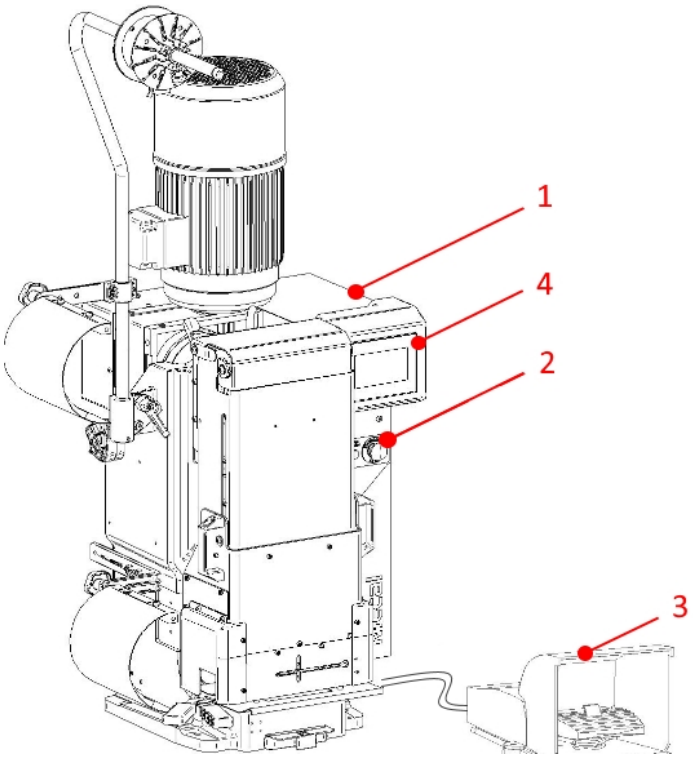
Since all machine movements are controlled by electrical and/or electronic signals, it is advantageous if these signals are controlled by qualified personnel.

Further clarifications on the electrical connections and the components used are available on the relative wiring diagram and on the relative bill of materials.

6.3 CONTROL SYSTEMS

Below is the location of the control systems on the machine.

- ① Electrical panel
- ② Control area.
- ③ Foot pedal switch.
- ④ Monitor.



6.3.1 ELECTRICAL PANEL

The electrical panel is an integral part of the machine safety cover. Leadthroughs for the signal cables, the power supply and the fuse housing are found on the rear. Just below are the interface sockets for accessories. The cooling fan and dust filter are located at the rear.

Drive	Description
	Type: Manual, padlockable two-position disconnecting switch: OFF (O) / ON (I). Function: Cuts off electrical power based on operator need.

6.3.2 CONTROL AREA

Drive	Description
	Type: Green lit button with guard. Function: Enables the machine auxiliaries.
	Type: Red hold-to-run push-button with rotation reset. Function: Allows emergency stop of all machine movements.

6.3.3 FOOT PEDAL SWITCH

The foot pedal switch is positioned on the floor in front of the machine.

Drive	Description
	Type: Foot pedal button, with hold-to-run action. Function: Starts up the machine cycle. Allows use of the JOG function.

6.3.4 MONITOR

Drive	Description
	Type: Touch screen monitor. Function: Allows interaction with the machine system.

ADDITIONAL INFORMATION

The monitor takes control of some manual commands, inhibiting their setting and managing the settings from the touch screen.

See the corresponding manual for more details.

6.4 INTERFACE SYSTEMS

The rear of the control panel houses a plate with interface connectors for accessories.

The interface connectors are arranged as follows:

① Inputs/outputs for external controls.

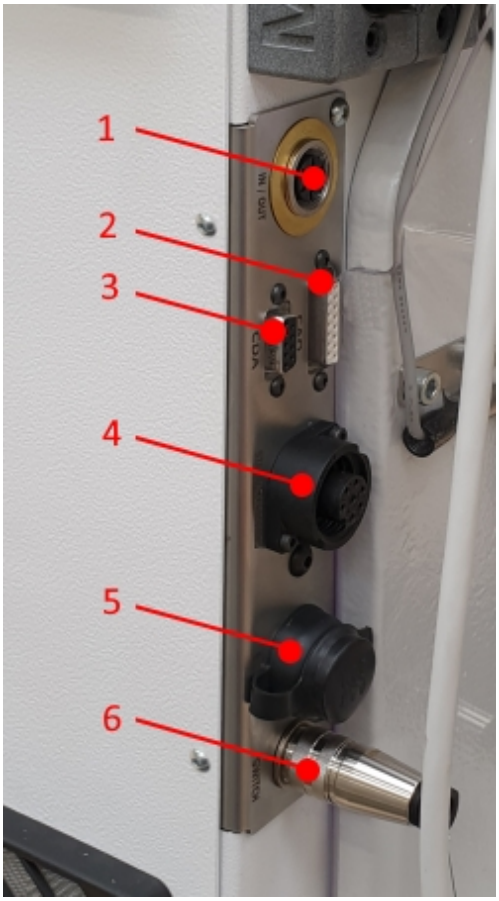
② CAO system inputs/outputs.

③ Connection to the external Load Cell.

④ Pedal or accessories input.

⑤ Ethernet plug.

⑥ Slide applicator consent.



It is possible to interface a supervisor computer to the crimping machine through connection to the LAN network. This allows control and data acquisition from/to the PLC with MOD-BUS transmission protocol.

ADDITIONAL INFORMATION

See the manual containing information on the crimping machine network connection manual and the MOD-BUS system for more details.

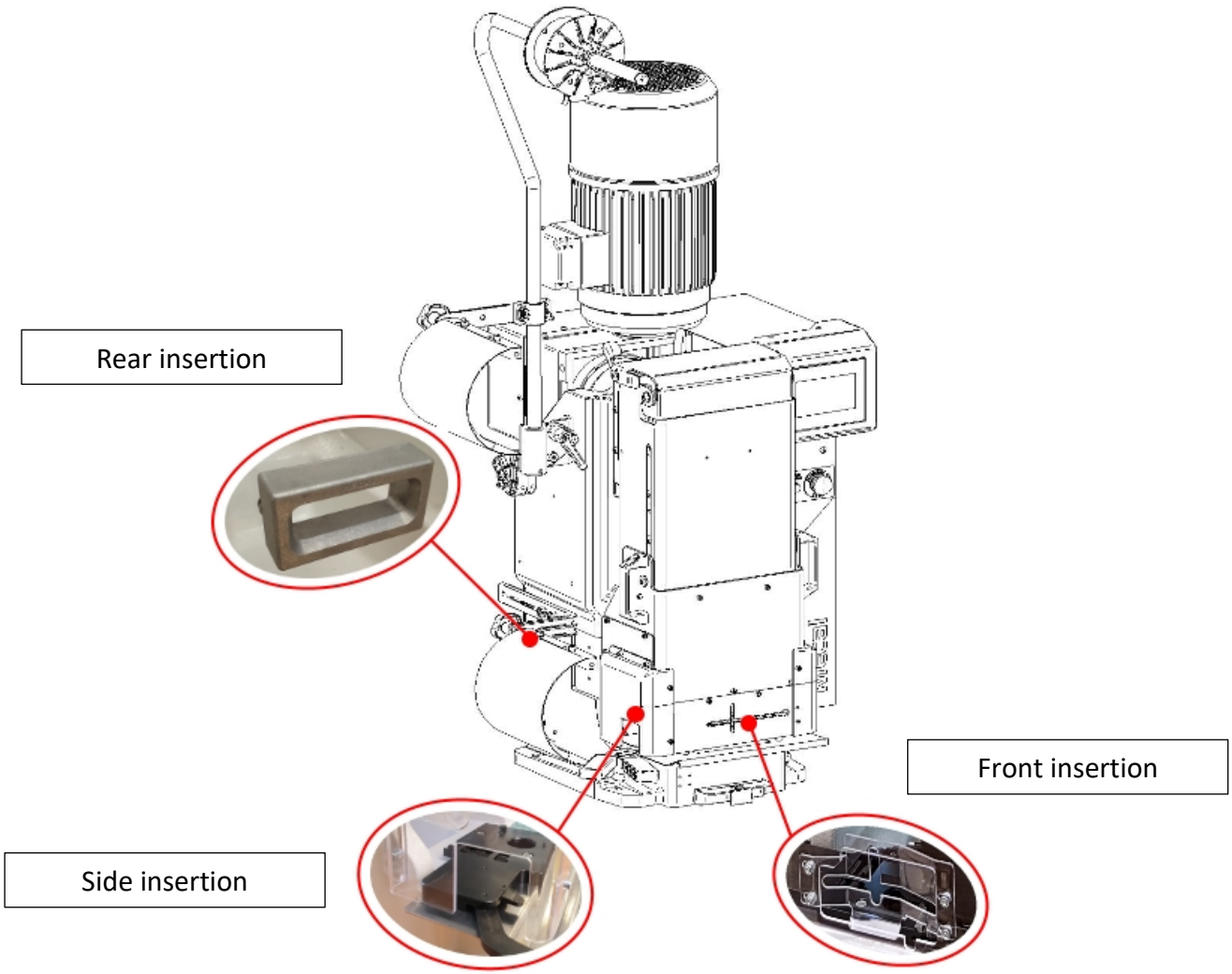
6.5 MACHINE ARRANGEMENT

HAZARD

All installation and maintenance operations must be carried out with the crimping machine in emergency conditions or switched off.

6.5.1 LOADING MATERIAL FOR MACHINING

The machine is able to receive the material to be processed through four entry points, depending on the different crimping operations: front, side (left/right), rear;



Front Loading

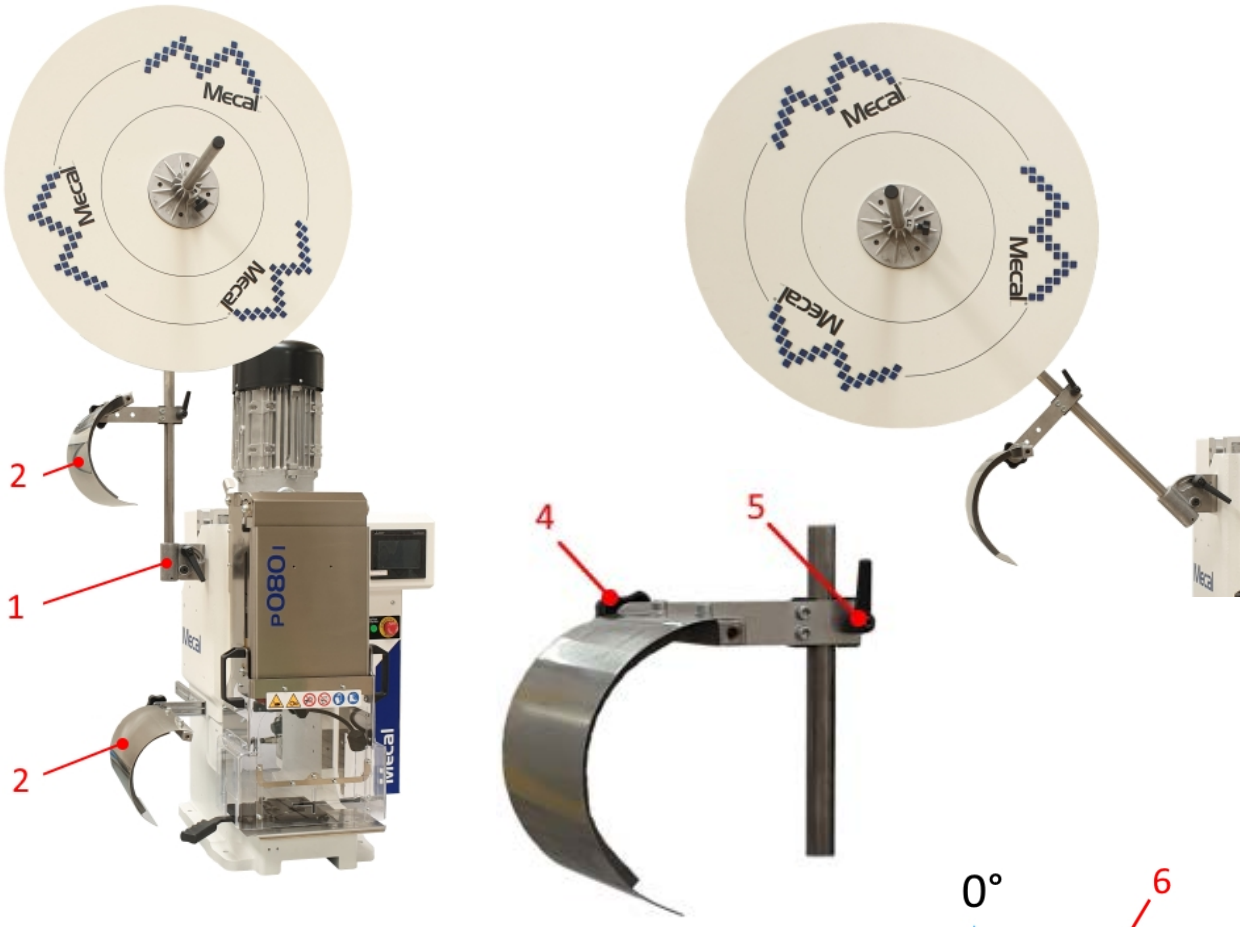
The loose terminal is placed manually in position on the slide applicator.
The slide is then moved once again manually into the crimping position.

Side Loading

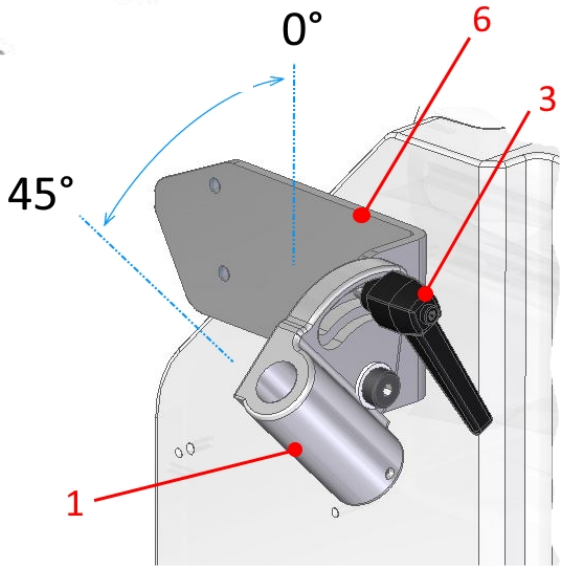
The terminal strip is inserted from the side inlet and the reel can be installed on an independent unwinding support.

The support of the rod ① has an adjustment of about 45 ° to tilt the reel and is installed on the front part of the bracket ⑥ while the coordination of the conveying plates ② facilitates the entry of the terminal into the work area to obtain a natural unwinding of the strip.

To orient the rod (from 0 ° to 45 ° with respect to the vertical axis) it is necessary to loosen the adjustable handle ③ on the support ①, while for the conveyor plates it is necessary to intervene on the lobe handwheels ④ and on the adjustable handles ⑤.



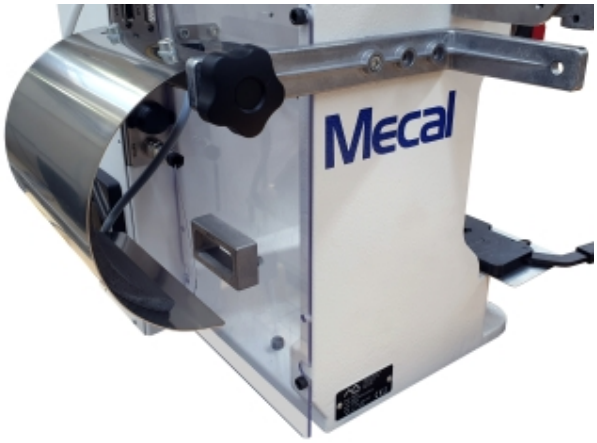
↓ Detail of positioning of the lower conveyor in the side reel loading condition.



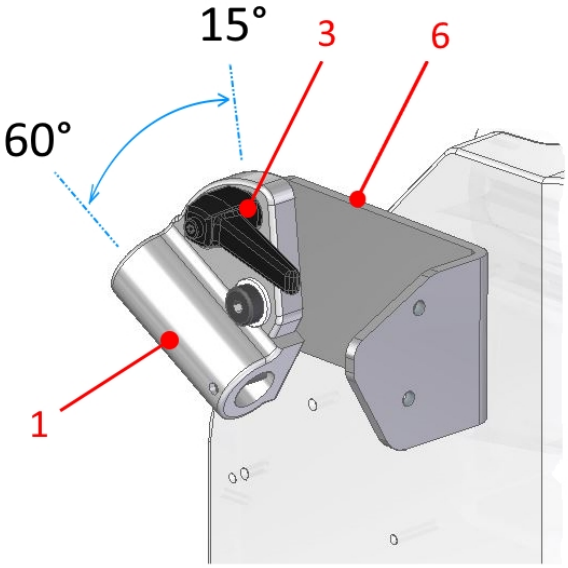
Rear Loading

The terminal strip is inserted from the rear inlet and the reel can be installed on an independent unwinding support.

The rod support ① has an adjustment of about 45 ° and is positioned on the back of the bracket ⑥. The orientation of the rod (from 15 ° to 60 ° with respect to the vertical axis) takes place by loosening the adjustable handle ③. To orient the conveyor plates it is necessary to intervene on the lobe handwheels ④ and on the adjustable handles ⑤.



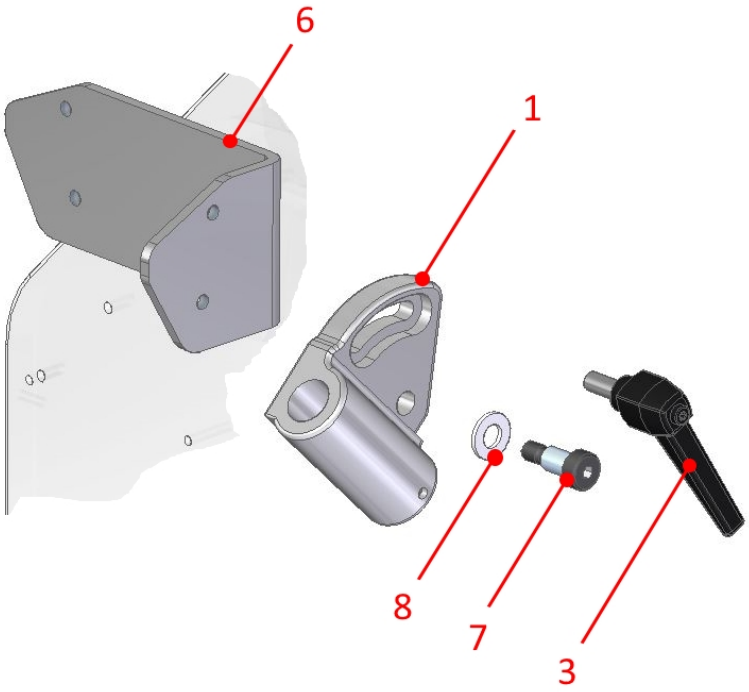
↑ Detail of positioning of the lower conveyor in the rear reel loading condition.

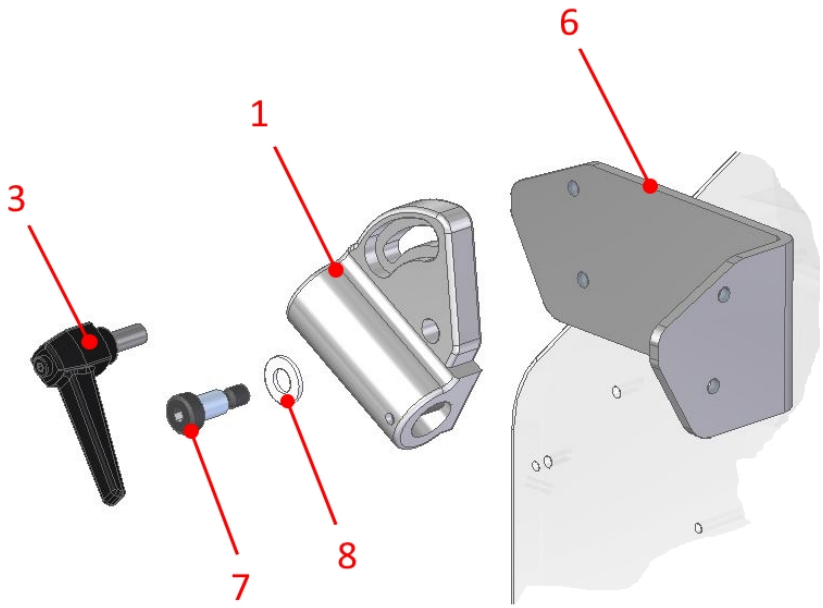


Change of swiveling support arrangement for side / rear loading

Position the swiveling support ① on the bracket ⑥ and fit the collar screw ⑦ with its washer ⑧.
Place the adjustable handle ③ by passing it through the slot in the support.
Orient the support in the desired position, tighten the collar screw and the adjustable handle.

Arrangement for side loading





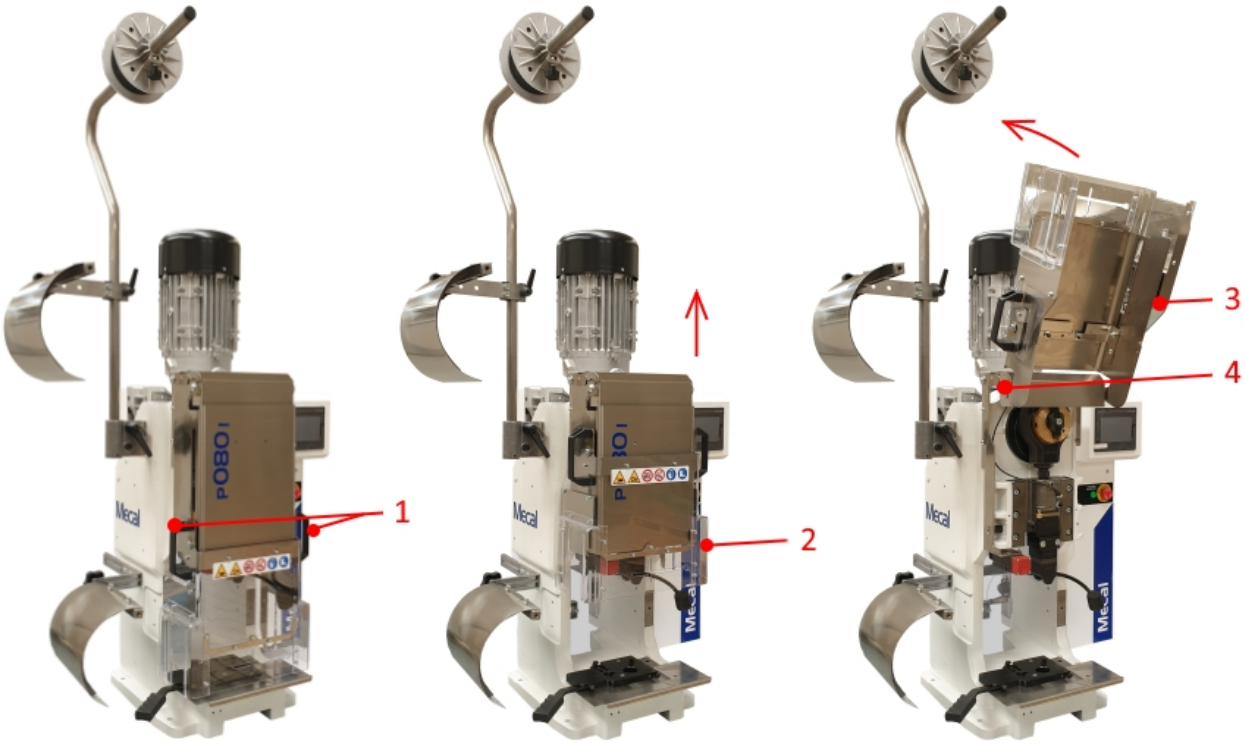
Arrangement for rear loading

6.5.2 OPENING AND CLOSING OF THE MANUAL MOVABLE GUARD

6.5.2.1 TILTING MOVABLE GUARD

Opening the tilting movable guard

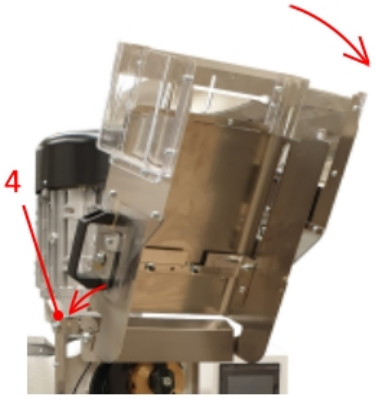
Lift the handles ① of the safety cover with both hands to open the movable Lexan door ②; then turn the steel safety cover ③ until the locking hook is engaged ④.



Closing the tilting movable guard

The guard is closed by pressing down on the locking hook ④ with the left hand, while rotating the steel safety cover ③ with the right hand. Then use both hands to lower the handles ① of the safety cover to close the Lexan door until the key is inserted in the interlocked switch.

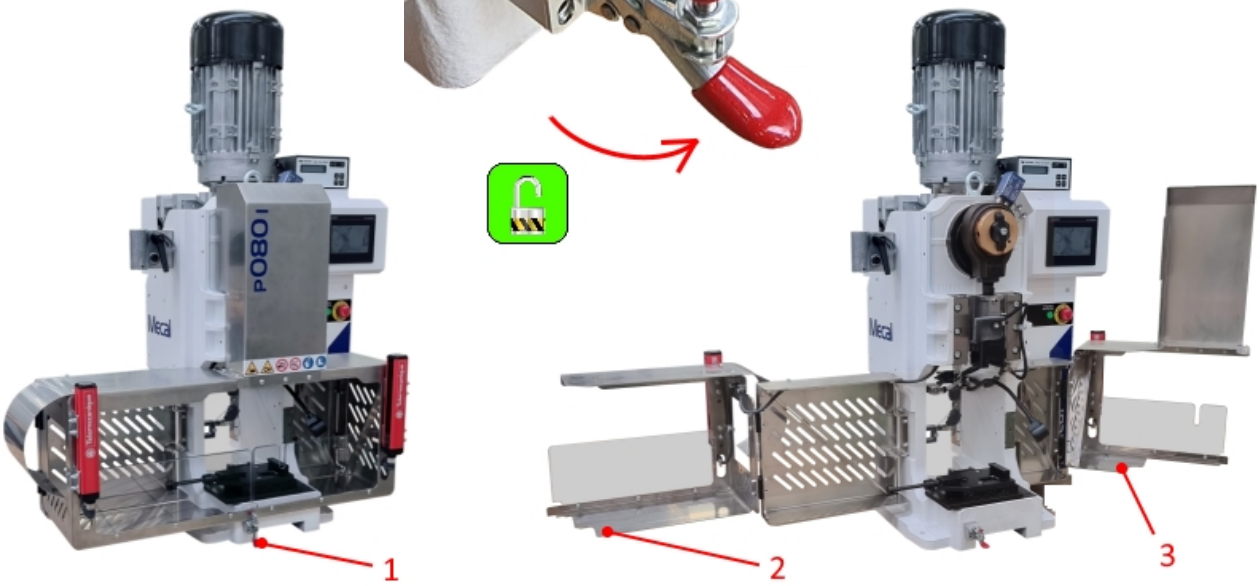
If the key is not correctly inserted in the switch, the crimping machine will not start and a warning message will appear on the monitor.



6.5.2.2 SAFETY COVER WITH BARRIERS

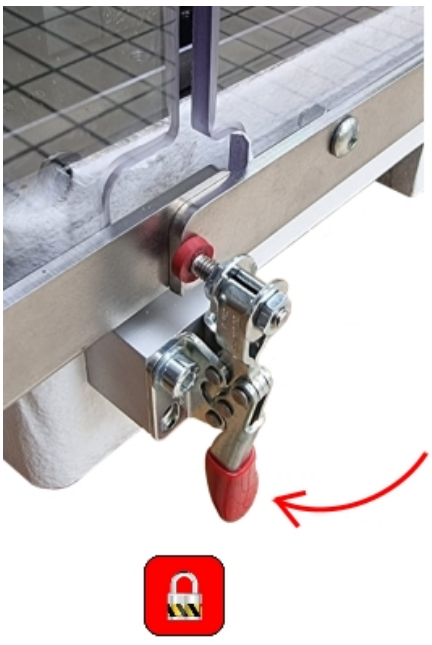
Door with barriers opening

Act on the protection closing presser ①, lifting the red lever unlocks the left door ② and consequently the right door ③. Open both halves of the casing on the door for maximum accessibility.



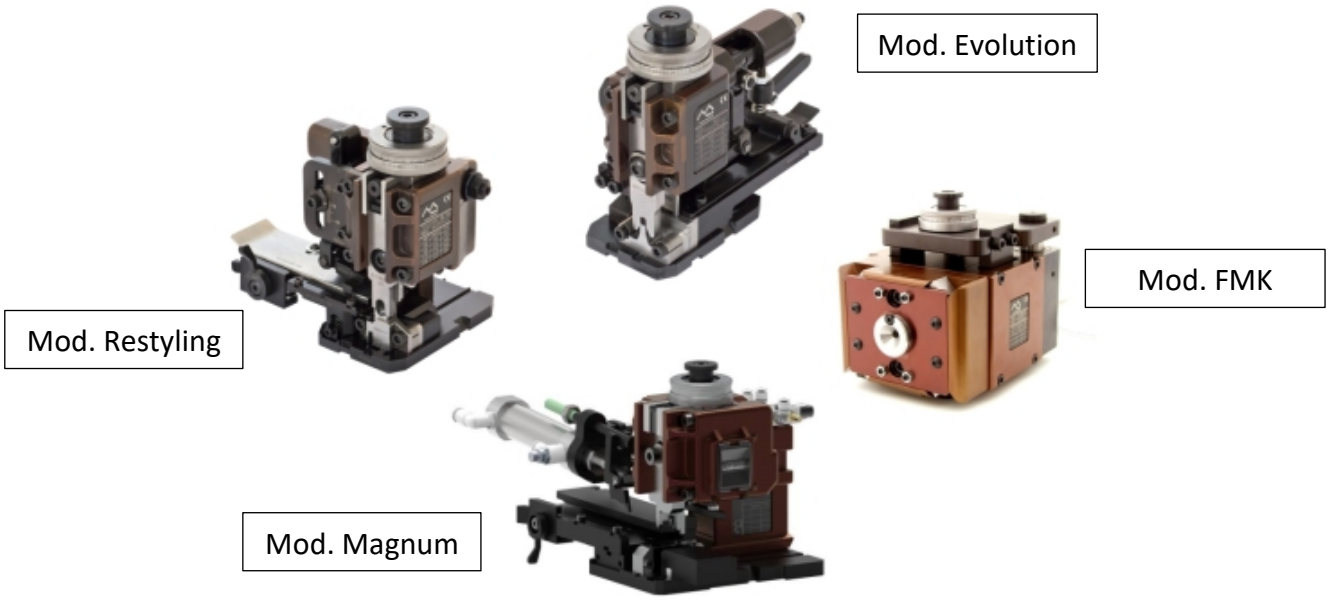
Door with barriers closing

Close by turning the right door and then the left one.
Act on the protection closing presser, lowering the red lever until it clicks.
If the doors are not closed properly and the barriers are not aligned, the machine will not start.



6.5.3 APPLICATOR INSERTION PROCEDURE

Restyling, **Evolution**, **Magnum** and **MK** series Mecal applicators are compatible with the crimping machine.



CAUTION

Pay attention during applicator installation/removal operations and their calibration so as not to damage parts of the machine.

CAUTION

Check the working height of the crimping machine and, if necessary, perform calibration with an appropriate tool.

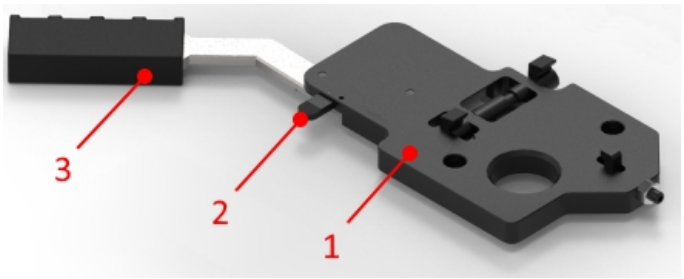
ADDITIONAL INFORMATION

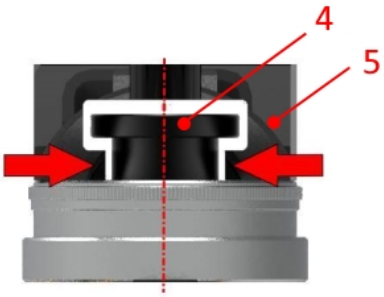
Always refer to the use and maintenance manual of the applicator to be installed on the crimping machine.

6.5.3.1 INSERTION ON A LEVER QUICK RELEASE BASEPLATE

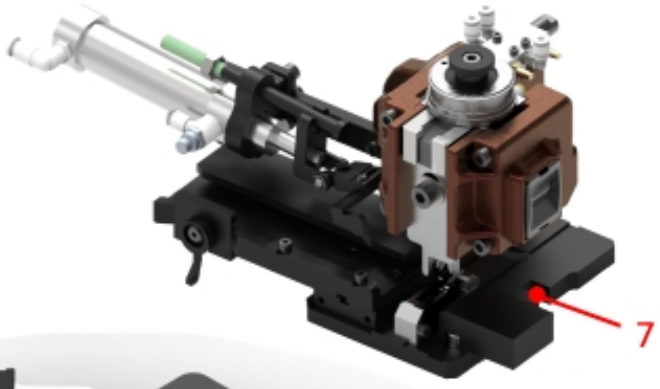
To insert the applicator:

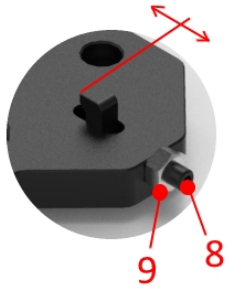
- Check that the crimping machine is switched off or in emergency status.
- Open the manual movable guard [see paragraph *6.5.2 – Opening and closing the movable guard*].
- Make sure that the bracket baseplate surface ⑥ of the applicator is clean and there is no residue from previous machining.
- Make sure that the crank is at top dead centre TDC.
- Check that the quick release baseplate ① is in the release position of the applicator and, if it is not, pull the trigger ② and simultaneously turn the lever ③ counter-clockwise to the release position.

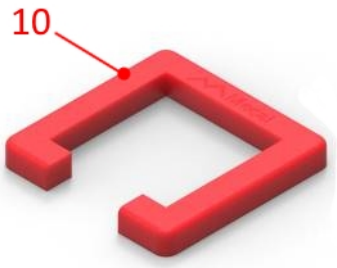




- Bring the applicator to the work area, pull out the ram unit and position the shank ④ in the "T" connection ⑤.
- Position the applicator over the baseplate ①, taking care to align the teeth ⑥ with the joints on the base of applicator ⑦.
- Check the perfect coplanarity between the applicator base and the quick release baseplate.
- Rotate the lever ③ clockwise until the trigger is locked ②.
- Verify the centring between the shank ④ and the "T" connection, or rather the alignment of the applicator axis with the crimping machine axis.
  Then, if necessary, align the applicator using the dowel ⑧, first loosening the nut ⑨.

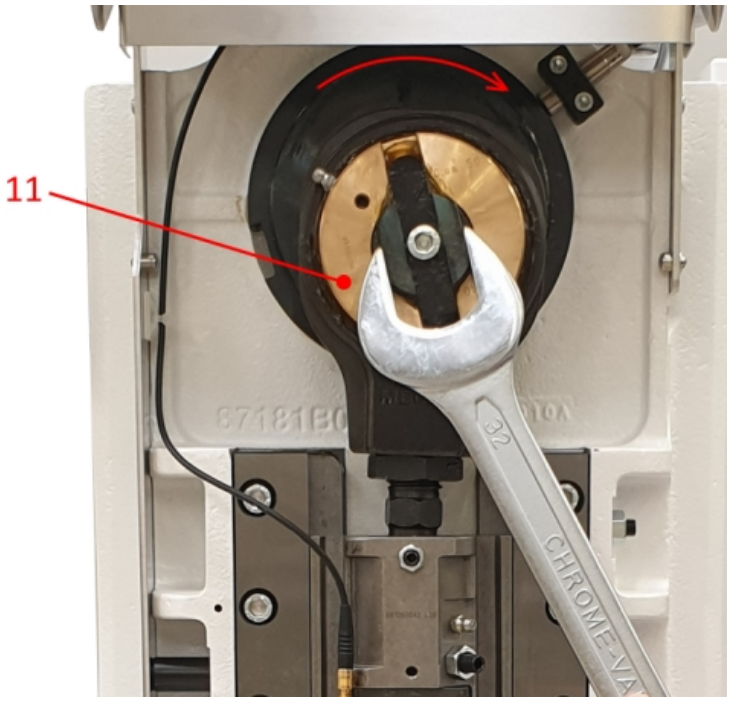






- Then check that it has locked correctly, checking that the applicator is coplanar to the fixing base and locked to it.
- Remove any cutlery protection ⑩ from the applicator.

- With the appropriate wrench, turn the crank ⑪ clockwise and complete the turn of the crimping machine, checking that there is no interference between the mechanical parts.



CAUTION

The control operation, indicated above, must be carried out with the applicator free: without any parts being machined.

CAUTION

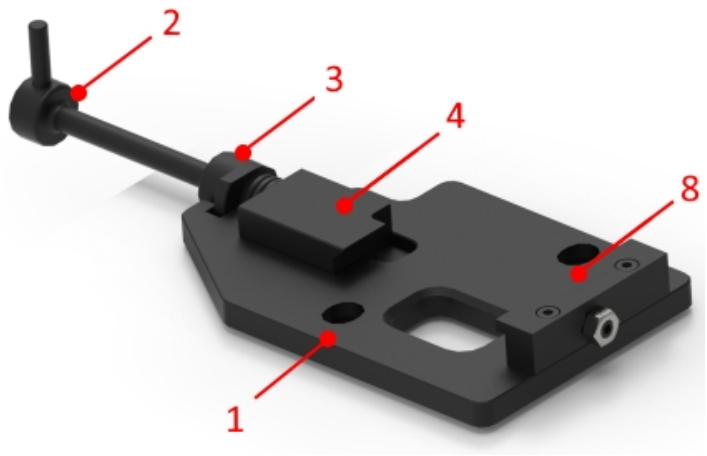
Check the correct feeding of the terminal and the correct alignment with the crimping parts of the applicator.

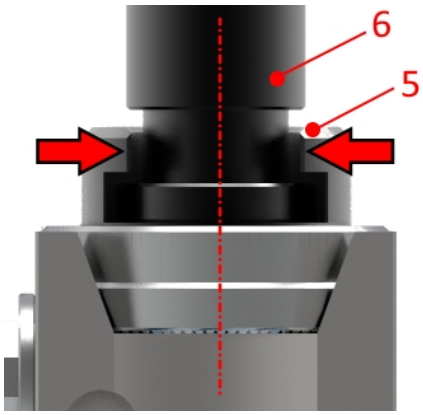
- Connect any electrical connectors on the applicator.
- Connect any pneumatic applicator piping to the solenoid valve.
- Close the manual movable guard [see paragraph *6.5.2 – Opening and closing the movable guard*].
- Turn the crimping machine on or remove it from emergency status.
- Perform a crimping cycle in JOG mode to check the correct crimping height adjustment.
- Make any adjustments to the applicator as described in the Use and Maintenance Manual.

6.5.3.2 INSERTION ON A ROTARY QUICK RELEASE BASEPLATE

To insert the applicator:

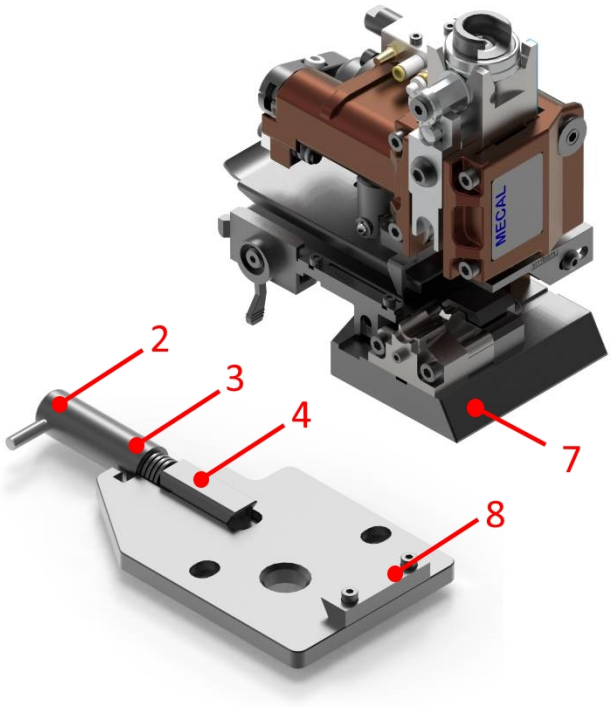
- Check that the crimping machine is switched off or in emergency status.
- Open the manual movable guard [see paragraph *6.5.2 – Opening and closing the movable guard*].
- Make sure that the bracket baseplate surface ⑥ of the applicator is clean and there is no residue from previous machining.
- Make sure that the crank is at top dead centre TDC.
- Check that the quick release baseplate ① is in the release position of the applicator and, if it is not, turn the handle ② until the cam is freed ③ from its housing and the movable tooth ④ is retracted.

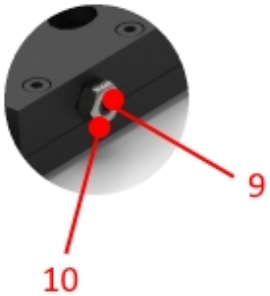




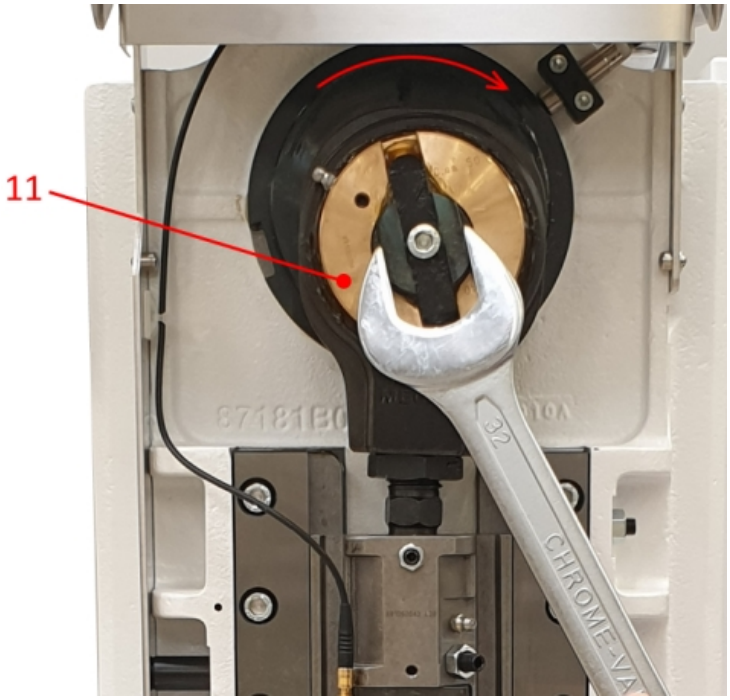
- Bring the applicator to the work area, pull out the ram unit and position the "T" connection ⑤ in the shank ⑥.
- Position the applicator over the baseplate ①, taking care to place the base of the applicator ⑦ next to the fixed tooth ⑧.
- Check the perfect coplanarity between the applicator base and the quick release baseplate.
- Move the movable tooth ④ forward, taking care to align it with the joint on the base of the applicator, until the cam ③ is in its housing and then turn the handle ② to bring the springs together.
- Verify the centring between the shank ④ and the "T" connection, or rather the alignment of the applicator axis with the crimping machine axis.

  Then, if necessary, align the applicator using the dowel ⑨, first loosening the nut ⑩ (left/right adjustment only available on some baseplate models).





- Then check that it has locked correctly, checking that the applicator is coplanar to the fixing base and locked to it.
- Remove any cutlery protection from the applicator.
- With the appropriate wrench, turn the crank ⑪ clockwise and complete the turn of the crimping machine, checking that there is no interference between the mechanical parts.



CAUTION

The control operation, indicated above, must be carried out with the applicator free: without any parts being machined.

CAUTION

Check the correct feeding of the terminal and the correct alignment with the crimping parts of the applicator.

- Connect any electrical connectors on the applicator.
- Connect any pneumatic applicator piping to the solenoid valve.
- Close the manual movable guard [see paragraph *6.5.2 – Opening and closing the movable guard*].
- Turn the crimping machine on or remove it from emergency status.
- Perform a crimping cycle test to check the correct crimping height adjustment.
- Make any adjustments to the applicator as described in the Use and Maintenance Manual.

6.5.3.3 QUICK CONNECTION PNEUMATIC APPLICATOR

The applicator can be equipped with a quick connector for Ø4 mm or Ø6 mm Rilsan® hose or a quick coupling connector (optional) for connection to the pneumatic power supply.

CAUTION

The air, destined for the machine and / or the applicator and deriving from the line, must be treated by a F.R.L. and result in **dry air**.

ADDITIONAL INFORMATION

Always refer to the operation and maintenance manual for the equipment to be installed on the crimping machine.

Applicator equipped with quick coupling for Ø6 hose

From the applicator fitting exit with a Ø6 mm hose and connect it to the quick coupling connector.

Applicator side

Crimping machine side

Applicator equipped with quick coupling for Ø4 hose

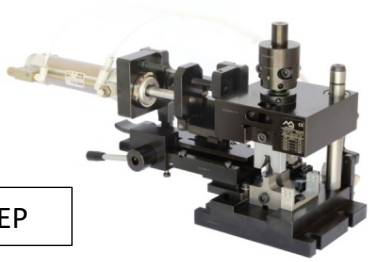
From the applicator fitting, exit with a Ø4 mm hose, insert a reduction from Ø6 to Ø4, connect the Ø6 hose and the latter to the quick coupling connector.

Applicator equipped with quick coupling connector (optional)

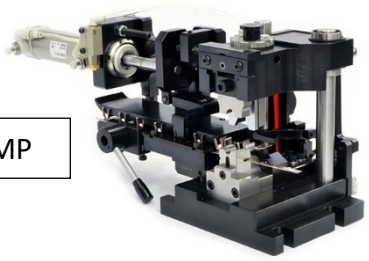
Connect the quick coupling directly to the appropriate fitting on the machine (see paragraph *5.2.2 - Connection to the pneumatic network*).

6.5.4 DIE INSERTION PROCEDURE

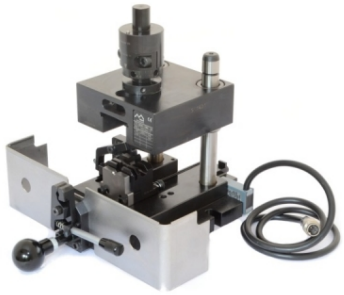
Mecal **MSES**, **MSEP**, **MSMP** and **MFSP** model dies are compatible with the crimping machine.



Mod. MSEP



Mod. MSMP



Mod. MSES

CAUTION

Pay attention during die installation/removal operations and their calibration so as not to damage parts of the machine.

CAUTION

Check the working height of the crimping machine and, if necessary, perform calibration with an appropriate tool.

CAUTION

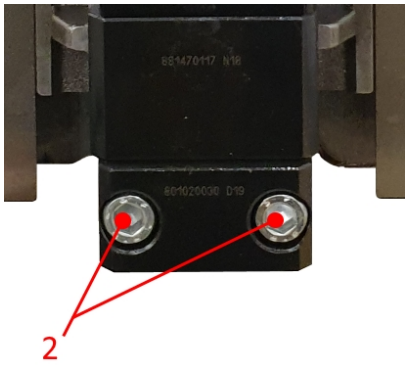
Check the compatibility of the stroke set on the crimping machine with the working stroke of the die and adjust if necessary.

ADDITIONAL INFORMATION

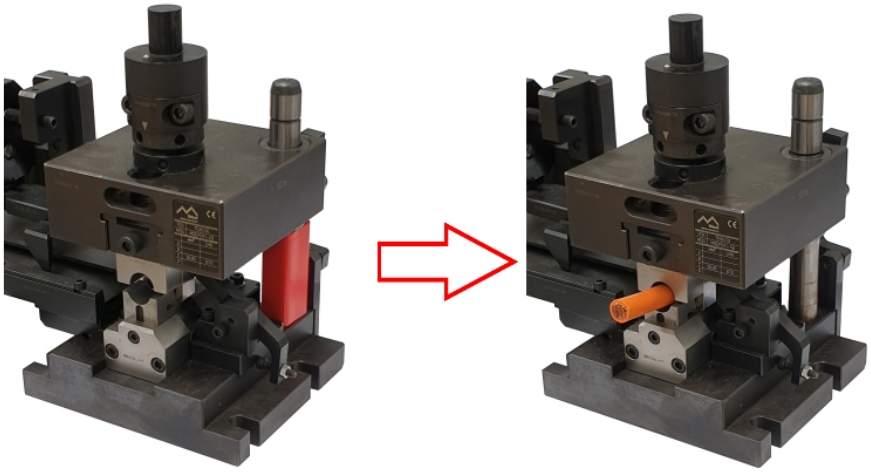
Always refer to the use and maintenance manual of the applicator to be installed on the crimping machine.

To insert the die:

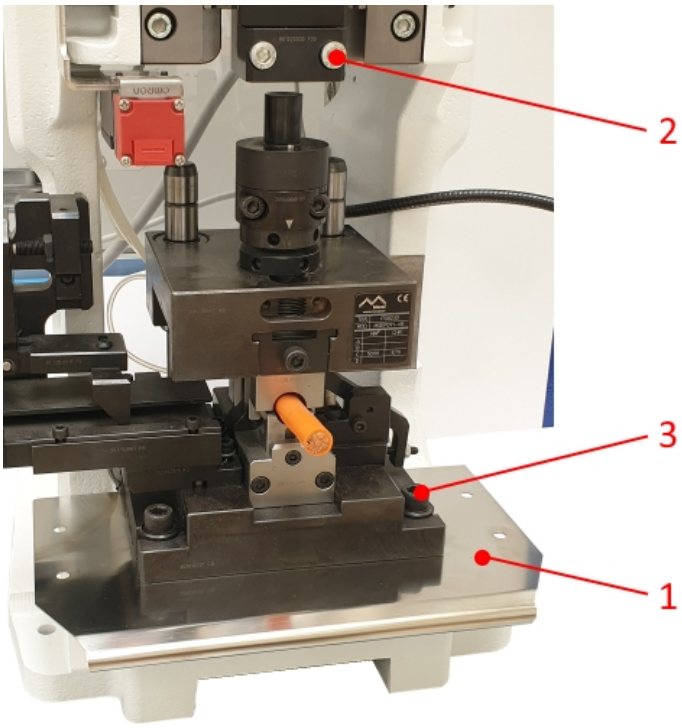
- Check that the crimping machine is switched off or in emergency status.
- Open the manual movable guard [see paragraph *6.5.2 – Opening and closing the movable guard*].
- Make sure that the base plate ① of the crimping unit is clean and there is no residue from previous machining.
- Make sure that the crank is at top dead centre TDC.
- Loosen the two screws ② of the shank attachment, not fully removing them.



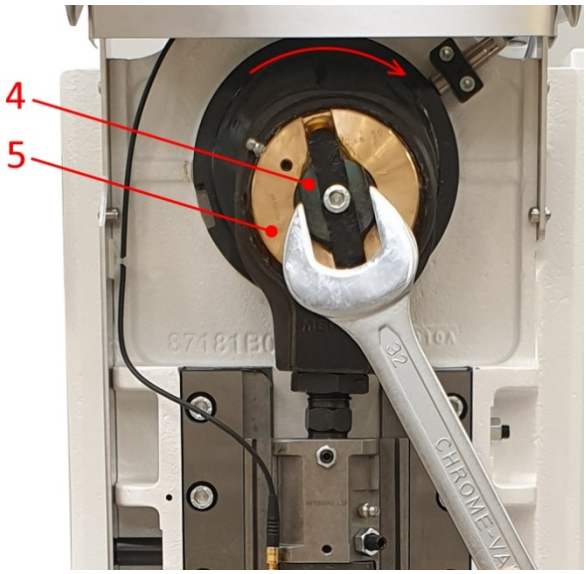
- Prepare the die: Remove the red protective spacer, place a piece of cable between the crimping die and the anvil to prevent damage to these parts and lay the top plate on the base of the die.

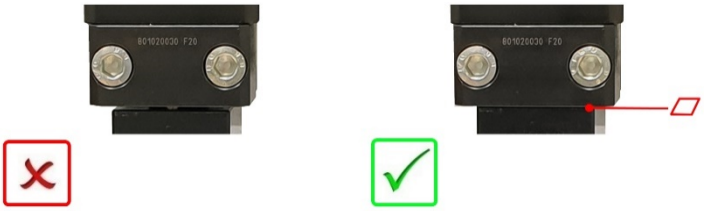


- Place the die on the support base ①, inserting the fixing screws ③ without tightening them. Pay attention to the cables and tubes of the applicator.



- Using the hexagonal seat on the shaft ④ with the appropriate wrench, turn the crank ⑤ clockwise until the slide unit is moved and the attachment ⑥ is centred on the die shank ⑦, eliminating the clearance between the two components.

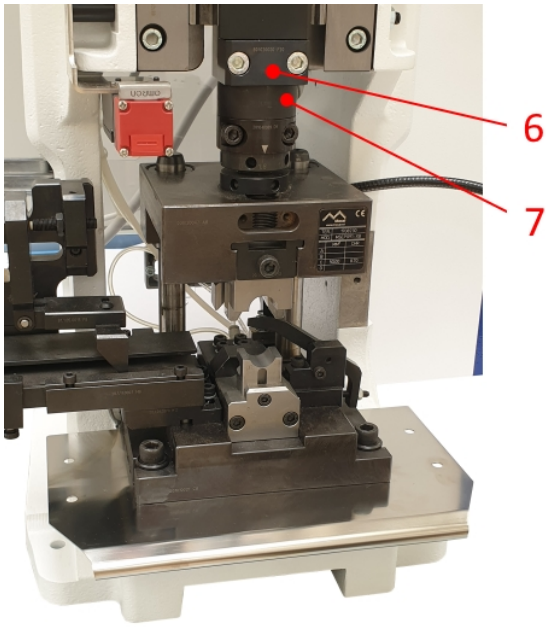




- Tighten the two screws ② of the coupling so that the remaining clearance of the semi-flange is equidistant.

Tighten the screws.

- Tighten the die fixing screws ③ to the base of the machine.
- Turn the crank ⑤ anti-clockwise until the cable previously placed between the crimpers is pulled out.



- Resume rotation of the ⑤ crank clockwise and complete the turn of the crimping machine, making sure that there is no interference and that the die columns slide freely.

CAUTION

The control operation, indicated above, must be carried out with the die free: without any parts being machined.

- Return the crank to top dead centre T.D.C.
- Connect any electrical connectors on the die.
- Connect any pneumatic piping on the die to the solenoid valve.
- Close the movable guard.
- Turn the crimping machine on or remove it from emergency status.
- Perform a crimping cycle in JOG mode to check the correct crimping height adjustment.
- Adjust the crimping height to the die as described in the Use and Maintenance Manual.
- Make any adjustments to the die as described in the Use and Maintenance Manual.

CAUTION

Check the correct feeding of the terminal and the correct alignment with the crimping parts of the die.

6.5.4.1 QUICK CONNECTION PNEUMATIC DIE

The DIE can be equipped with a quick connector for Ø6 mm Rilsan® hose or a quick coupling connector (optional) for connection to the pneumatic power supply.

CAUTION

The air, destined for the machine and / or the applicator and deriving from the line, must be treated by a F.R.L. and result in **dry air**.

ADDITIONAL INFORMATION

Always refer to the operation and maintenance manual for the equipment to be installed on the crimping machine.

Die equipped with quick coupling for Ø6 hose

From the die fitting exit with a Ø6 mm hose and connect it to the quick coupling connector.

Die side

Crimping machine side

Die equipped with quick coupling connector (optional)

Connect the quick coupling directly to the appropriate fitting on the machine (see paragraph *5.2.2 - Connection to the pneumatic network*).

6.5.5 ACCESSORY INSTALLATION PROCEDURE

The crimping machine can be equipped with a quick release baseplate with fitting for accessory equipment (e.g. stripping units, scrap cable cutters, etc.).

CAUTION

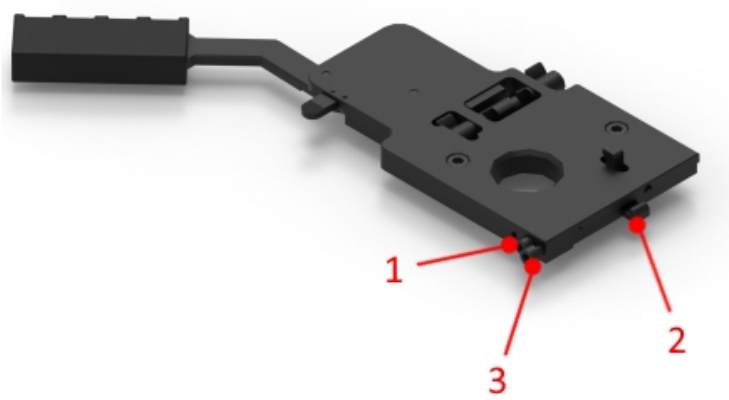
Pay attention during equipment installation/removal operations so as not to damage parts of the machine.

ADDITIONAL INFORMATION

Always refer to the operation and maintenance manual for the equipment to be installed on the crimping machine.

To insert the equipment:

- Check that the crimping machine is switched off or in emergency status.
- Access the work area [see paragraph *6.5.2 – Opening and closing the movable guard*].
- Unscrew the dowel ① in the counter-clockwise direction to loosen the retaining pin ②.
- Also loosen the TCEI adjustment screw ③.
- Position the desired accessory, fitting it over the head of the adjustment screw ③ and the pin ②.
- Screw in the dowel ① without tightening it: thus causing the retaining pin ② to come together but allowing the accessory to move linearly on the baseplate for its depth.
- Adjust the position using the screw ③.
- Once you have found the correct position, tighten the dowel ① to secure the accessory.



- Connect any electrical connectors to the crimping machine.
- Connect any pneumatic piping.
- Close the manual movable guard [see paragraph *6.5.2 – Opening and closing the movable guard*].
- Turn the crimping machine on or remove it from emergency status.

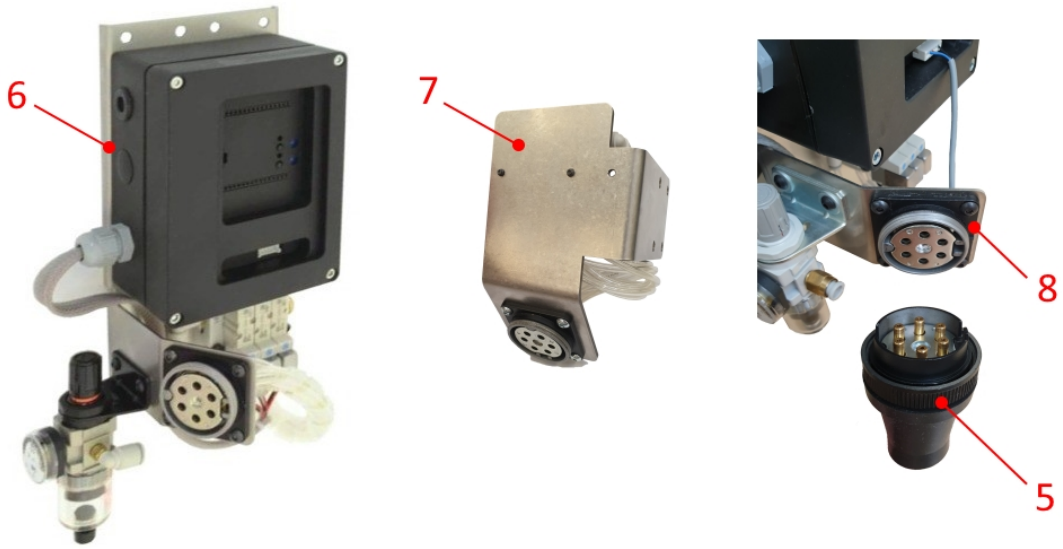
Perform a crimping cycle test to check the correct accessory adjustment.

6.5.5.1 QUICK PNEUMATIC ACCESSORIES CONNECTION

Mecal accessory equipment is equipped with a mobile quick coupling sleeve ⑤ for pneumatic connection with the crimping machine on which they are installed.

The coupling interfaces both with Mecal control units ⑥ and with the electro-pneumatic kit ⑦ on board the crimping machine.

To connect the male sleeve ⑤, deriving from the installed accessory, to the female coupling ⑧ of the control unit / kit, it is necessary to align the coupling points between the two connectors, insert the sleeve and screw the ring nut.



CAUTION

The air, destined for the machine and / or the applicator and deriving from the line, must be treated by a F.R.L. and result in **dry air**.

ADDITIONAL INFORMATION

Always refer to the operation and maintenance manual for the equipment to be installed on the crimping machine.

6.6 MACHINE USE PROCEDURES

6.6.1 INITIAL CHECKS

The operator must check the following before starting the machine:

- Make sure that all power sources are properly connected to the respective power supply networks.
- Make sure that there are no foreign bodies in the radius of action of the machine.
- Verify correct functioning of the safety devices present (emergency buttons, etc.).
- Check that the machine is not in maintenance or cleaning status.
- With the guards closed, verify that all keys are properly inserted in the interlocked switches.

6.6.2 CONNECTING POWER

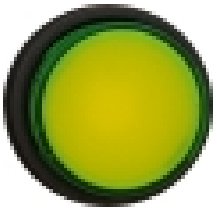
Before starting the machine:

- Connect the electricity.
- Turn the padlockable disconnecting switch on the electrical panel to the ON position (I).
- Switch on pneumatic power (if necessary).
- Open the tap upstream of the air handling unit (the machine does not have its own tap for cutting off pneumatic power.

6.7 OPERATING MODE

To start the crimping machine, press the "AUX ON" button on the left push-button control panel, enabling the auxiliary circuits. The light on the pressed button changes from flashing green to steady green.

If the button does not change its flashing status, verify that the machine is not in emergency or blocked status.



ADDITIONAL INFORMATION

Refer to the use and maintenance manual of the Display for information on the functions and detailed configurations of the crimping machine.

6.7.1 STARTING THE WORK CYCLE IN AUTO MODE

The Lexan guard must be correctly closed to start the work cycle in automatic mode. Select "AUTO" mode from the JOG menu and proceed by pressing the foot pedal switch.

ADDITIONAL INFORMATION

Refer to the use and maintenance manual of the Display.

6.7.2 JOG FUNCTION

The machine is fitted to work in automatic "AUTO" mode, but it also has a function called "JOG" that allows the slide unit to advance slowly, controlled by the operator.

This function can be activated only with the guards closed and from the JOG menu on the display, using the buttons on the monitor or via the crimping machine foot pedal switch.

In the first case, select and hold down the button of the desired direction of shaft and crank rotation to feed the slide unit in slow motion. Release the button to immediately stop movement in the desired position.

In the second case, the clockwise or counter-clockwise direction of rotation can be selected via the two buttons on the display and the foot pedal switch must be used to feed the slide unit in slow motion. Release the button to immediately stop movement in the desired position.

In both cases, the direction of rotation is reversible in any position of the slide unit.

ADDITIONAL INFORMATION

Refer to the use and maintenance manual of the Display.

6.7.3 CHOOSING THE WORK CYCLE IN AUTO MODE

The work cycle to be used for crimping can be selected in automatic “AUTO” mode. To select it, access the CYCLE menu on the display and press one of the buttons corresponding to the function:

Mod. A – Standard work cycle.

Mod. B – Slowed work cycle.

Split-Cycle – Split work cycle.

Selecting the work cycle takes you to the screen where you can edit the parameters.

ADDITIONAL INFORMATION

Refer to the use and maintenance manual of the Display for detailed information on the functions and ranges of values that can be set.

6.8 START-UP AFTER AN EMERGENCY STOP

If the machine cycle is interrupted by an emergency stop, you may need to intervene by opening the guard to eliminate the source of the error and/or danger and to reposition the crank to top dead centre T.D.C.

HAZARD

All status reset operations after an emergency stop must be carried out with the crimping machine in emergency status or switched off.

CAUTION

Be careful during status reset operations after an emergency stop so as not to damage parts of the machine and/or equipment.

WARNING

The crimping machine starts working only if the crank is in its initial position, at top dead centre T.D.C.

6.8.1 ACCESS TO THE WORK AREA IN EMERGENCY MODE

Accessing the work area in emergency mode is necessary to restore the initial position of the crank to top dead centre TDC and/or to remove any errors and/or check the machine conditions.

The procedure is as follows:

- Make sure that the machine is in emergency status or switched off.
- Perform all checks to make sure the machine is not yet in maintenance.
- Open the movable safety cover to access the work area and remove any errors and/or check the machine conditions.
- Close the safety cover.
- Switch on the crimping machine.
- Restore the status of the emergency stop push-button by turning it clockwise and checking that it returns to the stand-by position.
- Press the "AUX ON" button (the light must turn steady green).
- Start the work cycle.

6.8.2 RESTORING THE INITIAL MODE

The initial conditions are restored as a result of an emergency stop, but it is not necessary to enter the work area to remove any errors and/or check the machine conditions.

The reset procedure is as follows:

- Make sure that the machine is in emergency status or switched off.
- Perform all checks to make sure the machine is not yet in maintenance.
- Switch on the machine.
- Restore the status of the emergency stop push-button by turning it clockwise and checking that it returns to the stand-by position.
- Press the "AUX ON" button (the light must turn steady green).
- Use the JOG function to reposition the crank to top dead centre TDC.
- Start the work cycle.

Reset can be activated via manual operation:

- Make sure that the machine is in emergency status or switched off.
- Perform all checks to make sure the machine is not yet in maintenance.
- Open the movable safety cover to access the parts of the shaft and crank.
- Use a WR17 wrench to move the crank to top dead centre TDC.
- Close the safety cover.
- Switch on the crimping machine.
- Restore the status of the emergency stop push-button by turning it clockwise and checking that it returns to the stand-by position.
- Press the "AUX ON" button (the light must turn steady green).
- Start the work cycle.

WARNING

If the inverter is in error conditions, perform a “RESET”, switching off and keeping the machine off for more than a minute.

6.9 SWITCHING OFF THE MACHINE

To switch off the machine, turn the padlockable disconnecting switch on the electrical panel to OFF (O) and close the tap upstream of the system that arrives to the crimping machine.

6.10 UNLOADING THE MACHINE

CAUTION

Before making any movement, be sure to switch off the machine.

See the paragraph dedicated to switching off the machine for information.

6.10.1 UNLOADING MATERIAL FROM MACHINING

- If the applicator is not equipped with a strip cutting system or there is no additional system on the press, the residual strip that comes out of the equipment must be cut manually.
- Please refer to the use and maintenance manual of the applicator or die installed for material unloading (extraction of the residual terminal pieces on the strip).
- To remove the applicator, follow the reverse steps described in paragraph *6.5.3 - Applicator insertion procedure.*
- To remove the die, follow the reverse steps described in paragraph *6.5.4 - Die insertion procedure.*
- Remove any machining residues, taking care to always leave the machine clean.

CAUTION

Refer to the use and maintenance manual of the applicator to remove the terminal from it and not damage any machine and/or equipment components.

7. DISMANTLING

The following paragraph contains some recommendations and indications to correctly carry out the operations for decommissioning, dismantling and removal of the machine at the end of its operating life.

ADDITIONAL INFORMATION

The operations described below are the sole responsibility of authorised personnel.

- Make sure that there is enough space around the machine to allow personnel to perform all necessary movements without risk.
- Move the padlockable disconnecting switch to the OFF position (O).
- Disconnect the mains supply.
- Cut off the pneumatic supply, discharge the system and disconnect the piping.
- Disconnect the power cables from the crimping machine electrical cabinet.
- Disassemble the machine, proceeding downward for each unit.

HAZARD

Be very careful of the possible falling of parts and/or components of the machine during removal. This could cause serious harm to operators.

- Remove the moving parts and, as much as possible, separate the various components by type of materials (plastic, metal, etc.), to be disposed of through separate collection.
- Remove and move the machine parts from the work area taking all necessary precautions.
- Before lifting considerable size and/or weight components, check that the lifting devices are correctly secured and use only suitable slings and equipment.

ADDITIONAL INFORMATION

Disposal operations must be carried out in accordance with the regulations in force in the country where the machine is installed.

NOTE

If difficulty arises in disassembly, demolition and dismantling of the machine or for greater safety, contact the Manufacturer and indicate the cause of the removal and the serial number of the machine.

- The machine is built with different recyclable or non-recyclable materials. For this reason, its removal involves careful separation of the materials: glass, steel, aluminium, copper, bronze, special alloy, plastic, etc.
- The Manufacturer shall not be liable for damage caused by the use of any individual components differing from those prescribed.

CAUTION

Scrapping must be carried out in compliance with the laws in force. These rules must be respected.

7.1 DISPOSAL

Throughout the entire period of use of the machine, different types of waste materials are produced/used or exhausted, such as lubricants, etc.. Some specific regulations for environmental protection apply for the disposal of some of these materials.

The following environmental protection rules must be obeyed regarding the disposal of used lubricants:

- Lubricants risk contaminating water and soil; therefore, never pour lubricating products on the ground, in the water, or in sewer drains. Any infringement of these rules may be punishable by law. When using lubricants, keep an oil binder close on hand.
- Carefully recover the used lubricants, separating the mineral-based products from the synthetic-based ones. Upon disposal, comply with the regulations in force regarding the disposal of used oils.

It is the Customer's obligation to be aware of the laws in force in his/her country and to operate in such a way as to follow these laws.

Device 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.

8. MAINTENANCE

8.1 GENERAL SAFETY PRECAUTIONS

Maintenance, troubleshooting and repair operations are only allowed to be performed by authorised personnel.

Personnel in charge of machine operation and maintenance must be properly trained and have in-depth knowledge of accident prevention regulations. Unauthorised personnel must remain outside the work area during operations.

The accident prevention precautions contained in this paragraph must always be strictly observed during machine operation and maintenance in order to avoid harm to personnel and equipment.

These precautions will be referred to and further detailed in the Manual each time a procedure involving the risk of harm or injury will be required, by means of CAUTION and HAZARD notes:

HAZARD

Hazard notes precede an operation that can cause injury if not performed correctly.

CAUTION

Caution notes precede an operation that can cause damage to equipment if not performed correctly.

Restore the existing protections, checking their correct functioning, at the end of each maintenance operation.

SAVING

It is advisable to download the documents of each machine in possession, for easier and more immediate consultation.

8.1.1 GENERAL HAZARD NOTES

- High voltages can cause death on contact. Always operate with the utmost caution and according to the accident prevention regulations in force in the country.
- There are moving parts on the machine when it is running which can cause serious damage to people. For this reason, cleaning and specialised maintenance operations, relative to the dismantling or replacement of components on the machine and on the control units, must be performed with the system switched off and with systems unpressurised.
- The main disconnecting switches must be in the OFF position and locked with the safety padlock.
- Affix specific warning signs ("MACHINE MAINTENANCE - DO NOT CONNECT POWER") in correspondence with the electrical panel and on the air treatment unit.
- Keep away from the holes and from the drain cocks during system pressure discharge operations.
- Avoid the use of flammable or toxic solvents.
- Always use protective goggles and gloves when performing maintenance operations on the equipment.
- Make sure that the tools to be used are in perfect condition and have insulated handles, where required.
- Make sure that the insulation of the cables and conductors on test equipment does not show the slightest sign of breakage or damage.
- Failure to ground the equipment can cause serious personal injury. Always make sure that the ground connections are present and that they comply with standards.
- Prolonged overloads or failures can cause the overheating of electric motors and electrical equipment, with the creation of harmful fumes. Immediately cut off the power supply for safety and do not approach the equipment until the fumes have been dispersed with adequate ventilation. Avoid inhaling the fumes left inside the equipment during repairs.
- In case of fire, never use water jets on the equipment. Disconnect all power supplies and use CO2 fire extinguishers.
- Avoid prolonged, excessive or repeated skin contact with lubrication products and change clothes immediately if soaked, as lubricants are very harmful to the skin.
- Do not handle lubricants (such as oils, greases, etc.) in the presence of electrical sparks or open flames.

HAZARD

Lubricants are flammable products. Comply with the indications provided by the signs placed on the containers.

- Before making connections, carefully inspect all the connections and make sure there are no dirt or defects on the threading.
- Before applying pressure to the systems following a repair, verify the correct tightness of connections and joints.

- Before operating the equipment, always make sure that maintenance personnel are outside the protected area and that tools or materials have not been left near the equipment.
- As much as possible, troubleshooting activities must be performed outside the protected area. If it becomes necessary during troubleshooting activities to carry out interventions with the control unit and the systems powered, all precautions required by safety standards must be taken for operation in the presence of dangerous voltages and of live units.
- Always keep away from any component that can be set in motion by pneumatic pressure, when the latter has not been completely discharged from the systems.
- Do not wear objects that could get caught in the equipment or act as conductors (chains, bracelets, etc.).
- Maintenance, repair and troubleshooting interventions must end with verification of correct machine operation and with the restoring of all its safety features.

8.1.2 GENERAL WARNINGS

- Maximum machine reliability and minimum maintenance costs are the consequence of a scheduled maintenance and inspection that is scrupulously followed throughout its entire life. Strictly comply with the established maintenance time intervals and the frequency of interventions according to specific needs in relation to the machine production cycle.
- If operations of a certain significance are required, it is advisable to contact the manufacturer for any clarifications on the project or for technical support.
- Before starting any checks and maintenance operations, it is advisable to remove dirt from the machine.
- Always use perfectly dry air during cleaning and with pressure not exceeding 0.2 Mpa.
- Always use tools in perfect condition and specially made for the operation to be performed. The use of unsuitable or inefficient equipment can cause serious damage.
- During dismantling, mark the individual parts with an identification plate to ensure that they will be correctly reassembled.
- After each maintenance operation involving the disconnection of wiring and/or fixed and mobile parts, verify that the number/plate matches with the fixed or mobile part.
- Before restarting the equipment after a breakdown, carefully inspect it to check for any damage.
- Except after a breakdown, never intervene on the adjustments and positioning of the limit switch microswitches, if present: tampering with them can cause serious damage.
- Always take the utmost care in checking the lubrication on the various machine components, as insufficient or defective greasing can be detrimental to proper functioning.
- For lubrication, only the recommended lubricants or lubricants with equivalent and known and proven qualities must be used.
- The lubricants used must have good emulsion stability and be unalterable by ageing.
- It is absolutely necessary to continue to use the lubricants used when filling for the first time.

- Upon completion of the traditional maintenance activities shown on the sheets, technical maintenance personnel must also perform instrumental predictive maintenance operations when required, consisting of specialised analyses and checks aimed at predicting the occurrence of faults over time on some machine components.

8.2 QUALIFICATION OF MAINTENANCE PERSONNEL

CAUTION

The safety manager shall ensure that all the people working on the machine have received all the instructions concerning their task contained in this manual, including the initial installation and commissioning operations.

8.2.1 GENERAL SKILLS

To meet the need for ever-increasing qualification in the field of maintenance, maintenance personnel must:

- Be familiar with the directives in force concerning accident prevention during work performed on machines with motor drives and be able to apply them
- Have read and understood the paragraph on "Safety devices applied to the machine”
- Know the fundamental construction and functions of the handling systems
- Know how to use and consult manufacturing files and the machine documentation
- Take responsibility for making autonomous decisions regarding work on fully automatic manufacturing systems
- Be willing to adapt to technological changes on the machines
- Note irregularities in the production process and take the necessary measures, if necessary.

8.2.2 SKILLS RELATED TO QUALIFIED PERSONNEL

The composition and qualification of the personnel teams indicated in the maintenance plan are those recommended by the Manufacturer.

If necessary, the various operations can also be carried out by personnel with the same or higher qualifications who have followed corresponding training courses

The professionals responsible for intervening on the machine are as follows.

Machine manager

Typical activities:

Quality control and maintenance on part handling systems, in particular:

- Use and evaluation of diagnostic system results
- Use of the machine in its normal operating conditions and restoration of operation after the emergency stop switch has tripped
- If necessary, quality control and taking the necessary quality maintenance measures
- Cleaning of some parts of the machine (supporting elements, fixing elements)
- Collaboration to perform the following activities:
  - ✓ Maintenance
  - ✓ Troubleshooting and repairs

Carrying out regular checks/verifications, in particular:

Regular checks/verifications, in particular:

- Seal check of piping
- Lubrication effectiveness check
- Check of the state of wear of protective devices
- Check of the state of wear of cables and flexible hoses
- Checks for the absence of oil leaks visible around the hydraulic systems, where present
- Checks for the absence of foreign bodies in the machine work area
- Operational check on signal lamps
- Checks of operating pressures and flow rates in the hydraulic, pneumatic where present, lubrication systems

Required technical knowledge:

- Knowledge of machine use
- Knowledge of the lubricants used and the dangers associated with their use
- Logical search methods for failures and the evaluation of results
- Ability to organise in order to command and direct the necessary measures to return the machine to its functional state of use
- Professional experience on handling systems for special pieces (automatic handling systems, element handling systems, etc.)
- Basic knowledge of control techniques and pneumatic where present, hydraulic and electric regulation.

Required qualification:

- Complete training as an industrial mechanic, specialising in the technical automated systems sector.
- Instruction and training on the machine are ensured by the Manufacturer.

Lubrication personnel

Typical activities:

- Regular operations to empty and fill lubricant tanks on systems
- Checks of the lubricant level in the lubrication control units (where present)
- Checks of the lubricant level at points of motion
- Cleaning of lubricant tanks and replacement of their contents (where present)
- Topping up of consumed lubricant reserves
- Replacing too old or used lubricants

Required technical knowledge:

- Knowledge of the lubricants and greases used in the various interventions
- Ability to work independently according to pre-defined lubrication plans
- Knowledge of the correct methods of eliminating used lubricants, in the context of environmental protection

Required qualification:

- This work can be carried out by qualified personnel who have undergone a sufficiently long training period on the machine.

Mechanical maintenance personnel

Typical activities:

- Perform preventive maintenance, overhaul and, if necessary, repair of mechanical units, in particular:
- Checks on the execution of movements
- Checks of mechanical clearance
- Repair of mechanical units

Required technical knowledge:

- Substantial knowledge of mechanical, pneumatic and hydraulic installations
- Knowledge of numerical controls used on the machine
- Fundamental knowledge of electrical control and regulation techniques
- Ability to evaluate the results of reviews and to decide on necessary measures
- Knowledge on preparing audit reports

- Knowledge of measurement and test methods to determine actual machine conditions.

Required qualification:

- Complete training as an industrial mechanic, specialising in the technical sector.

Electrical/electronic maintenance personnel

Typical activities:

- Performing preventive maintenance, overhaul and, if necessary, repair of electrical and electronic units, in particular:
  - ✓ Analysis of microprocessor equipment failure
  - ✓ Analysis of electronic circuit failure

Required technical knowledge:

- Knowledge of troubleshooting and repair methods for faults in the control system, carried out through diagnostic systems, computerised control systems or similar equipment

Required qualification:

- Complete training as an industrial electronics engineering, specialising in the technical sector of devices.

8.3 SAFETY CONTROL PLAN

CAUTION

Electrically or mechanically bridging the circuit breakers on the safety circuits or tampering with them in any way is strictly prohibited.
Periodically check the efficiency of the safety systems on the machine.
This procedure must be repeated as part of normal maintenance practice.

8.3.1 CHECKS AND FUNCTIONAL TESTS ON SAFETY DEVICES

These operations must be carried out by competent personnel with specific knowledge on the use of safety devices.

EMERGENCY BUTTONS

Press each button on the machine and verify that it stops immediately.

INTERLOCKED SAFETY SWITCHES

Check the correct functioning of the systems following the various openings of the movable guards. Check their correct fixing.

ASSEMBLY FASTENERS

Check that nuts and bolts have not become deteriorated. Particular attention must be paid to the fixing screws on the parts.

CAUTION

Maintenance personnel must periodically check the functionality of safety devices.

8.4 MACHINE STOP PROCEDURE

Before carrying out the maintenance procedures described in the following chapter, the operator must stop and put the machine in maintenance status, following the procedure below:

- Set the machine in optimal conditions to be able to resume operation without delays due to abnormal cycle conditions.
- Isolate and padlock the power sources of the machine, if maintenance operations require it. In other cases, make no changes.
- Check for the presence of residual energy and discharge it before operating on the device, if necessary.
- Affix the sign "MACHINE IN MAINTENANCE - DO NOT OPERATION - WORKS IN PROGRESS, DO NOT RUN" near the main switches;

- At the end of the maintenance operations, restore the previously deactivated power supplies.
- Before resuming normal operations on the machine, re-check the entire system in accordance with the start-up procedures indicated in this manual.

8.5 ADJUSTMENTS

HAZARD

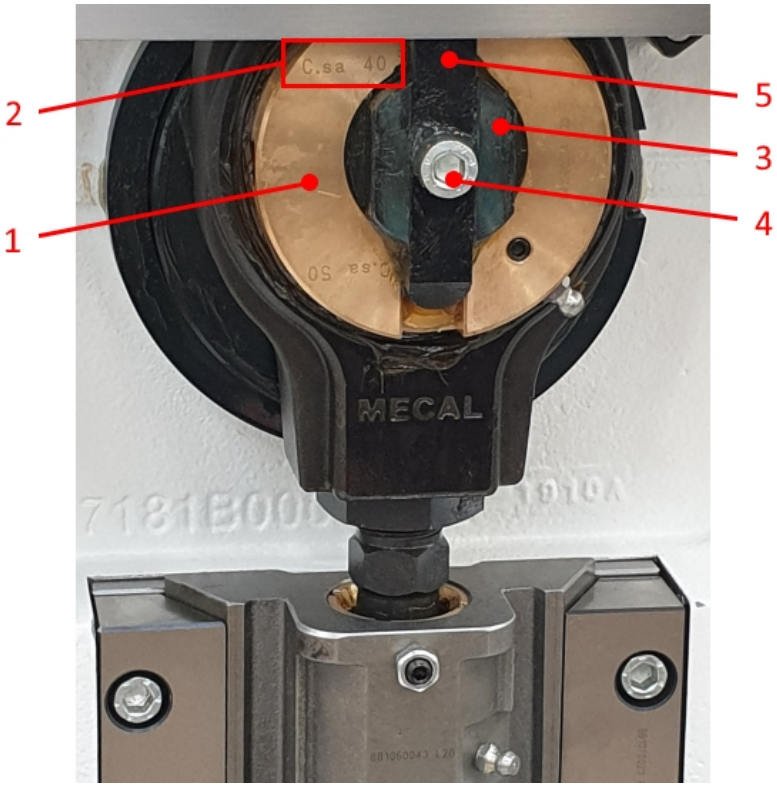
These checks and verifications must be carried out with the machine stopped and with all energy sources deactivated.

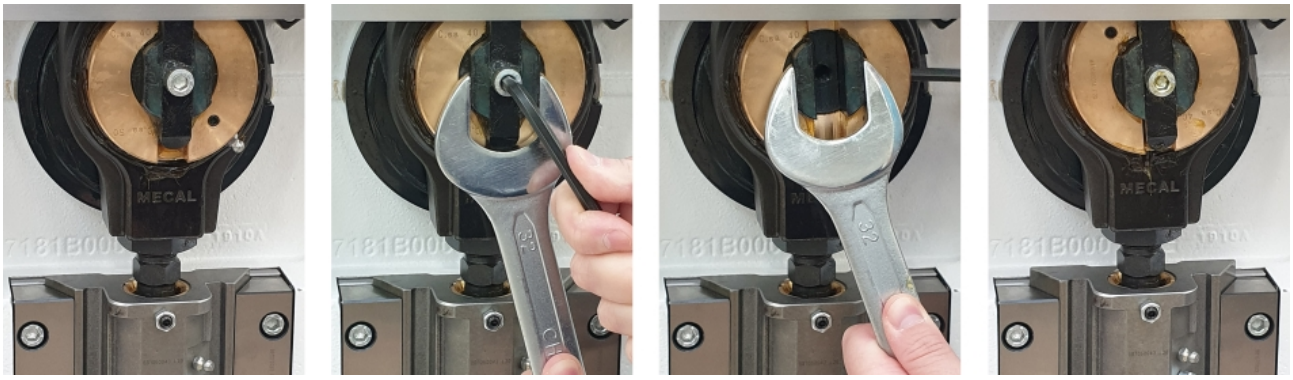
8.5.1 CHANGING PRE-SET STROKES

It is possible to vary the crimping machine stroke from one of the two pre-sets.
Bring the bringing the slide unit to top dead centre then, with the machine in stand-by, read the set stroke ② on the bush ①.

Perform the following operations to change the stroke:

- Use the supplied wrench to hold the shaft ③ and a 6mm Allen key to loosen the screw ④.
- Remove the screw and consequently the key ⑤.
- Using the Allen key, turn the bush ① 180°, bringing the key housing on the crank ① back into alignment with the key housing on the shaft ③.
- Insert the key ⑤ and insert the screw ④.
- Tighten the screw with the Allen key while holding the shaft in place with the wrench.
- Calibrate the crimping machine as described in paragraph *8.5.2 – Adjusting the working height of the crimping machine*.





CAUTION

Each time the stroke is changed, verify the correct calibration height of the crimping machine at the bottom dead centre B.D.C.

ADDITIONAL INFORMATION

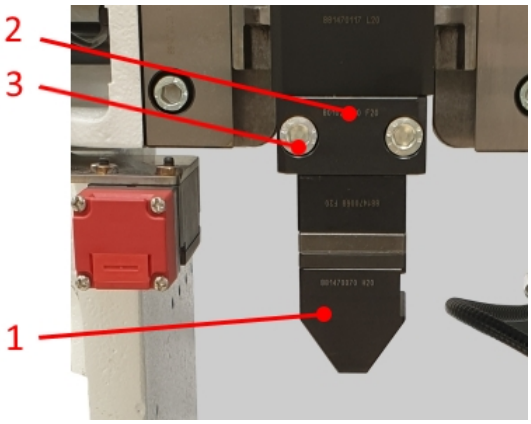
Always refer to the use and maintenance manual of the equipment to be installed on the crimping machine.

8.5.2 CHANGING WORKING HEIGHTS

The working height can be changed by installing or removing the entire "T" connection unit ① from the shank attachment ② on the crimping machine.

Installing the “T” connection will result in a working height of 135.8 mm (5.35 in); removing the “T” connection will result in a working height of 212 mm (8.35 in).

To remove the unit, loosen the two screws ③ on the shank connection.



Detail of the “T” connection unit.

Verify the perfect coplanarity between the support and the shank connection: this operation guarantees the correct crimping height of the machine.

CAUTION

Each time the working height is changed, verify the correct calibration height of the crimping machine at the bottom dead centre B.D.C.

ADDITIONAL INFORMATION

Always refer to the use and maintenance manual of the equipment to be installed on the crimping machine.

8.5.3 ADJUSTING THE WORKING HEIGHT OF THE CRIMPING MACHINE

Working height calibration operation is performed after a working height check with a negative outcome. For more information, see paragraph *5.3.1.1 - Checking crimping machine calibration*.

CAUTION

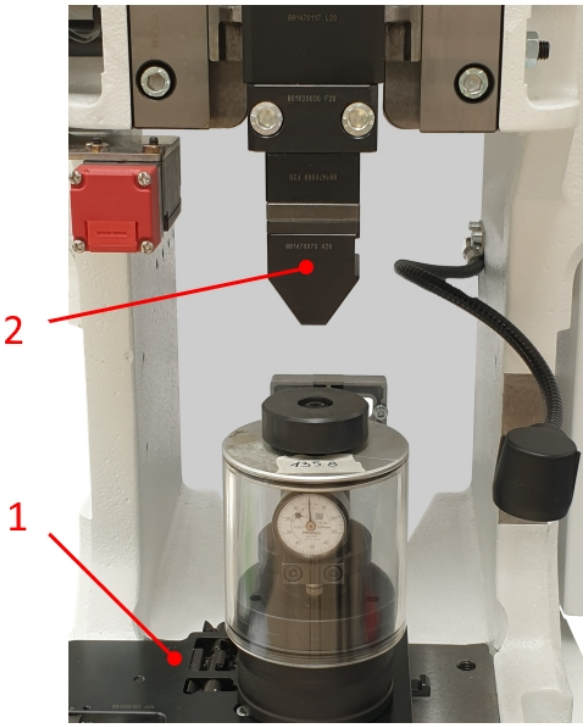
Verification of the correct calibration height of the crimping machine at the bottom dead centre B.D.C. is a very important operation for the correct functioning of the machine itself and the equipment installed on-board.

ADDITIONAL INFORMATION

Always refer to the use and maintenance manual of the equipment to be installed on the crimping machine.

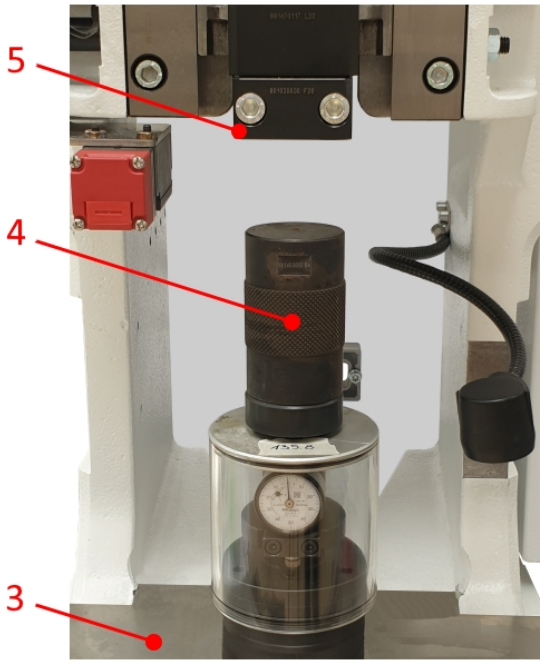
The operations to carry out for calibration:

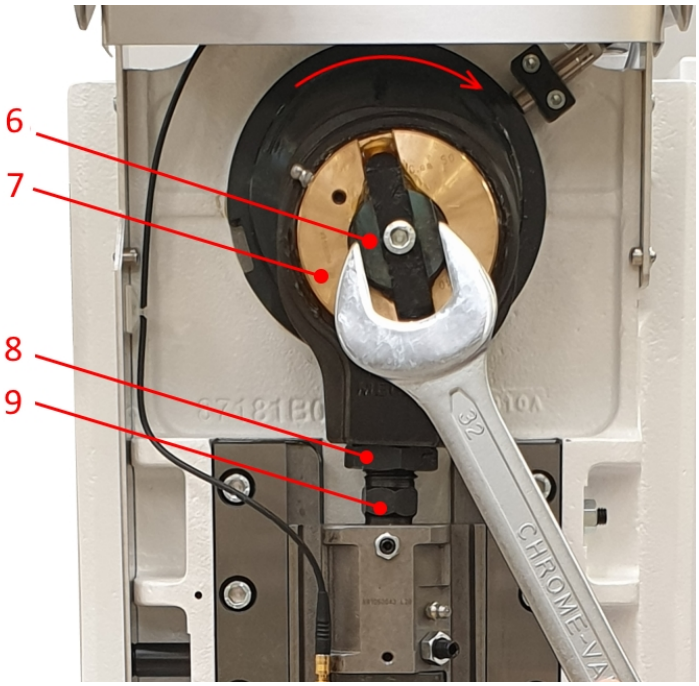
- Make sure the machine is switched off to safely access the work area.
- Place the calibration tool on the baseplate ① and under the "T" connection ② <u>if the working height is 135.8mm (5.35 in), for use with an applicator</u>.
  Place the calibration tool on the protective plate ③ at the base and the spacer ④ over the tool and under the shank ⑤ (the "T" connection must be removed: for detailed information, see paragraph *8.5.2 – Changing working heights*) <u>if the working height is 212mm (8.35 in), for use with a die</u>.



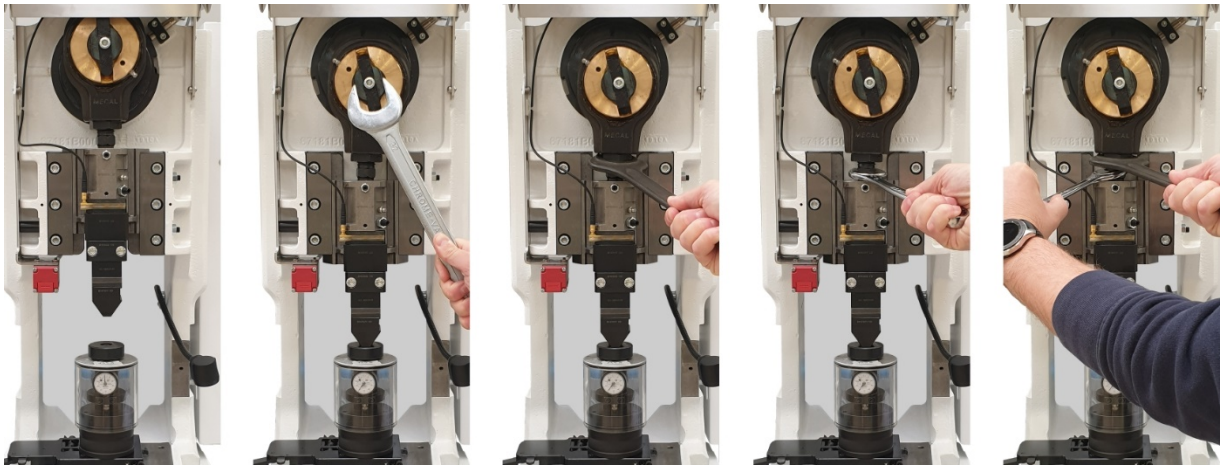
Calibration height 135.8 mm (5.35 in). → For Miniapplicator installation.

← Calibration height 212 mm (8.35 in) for die installation.

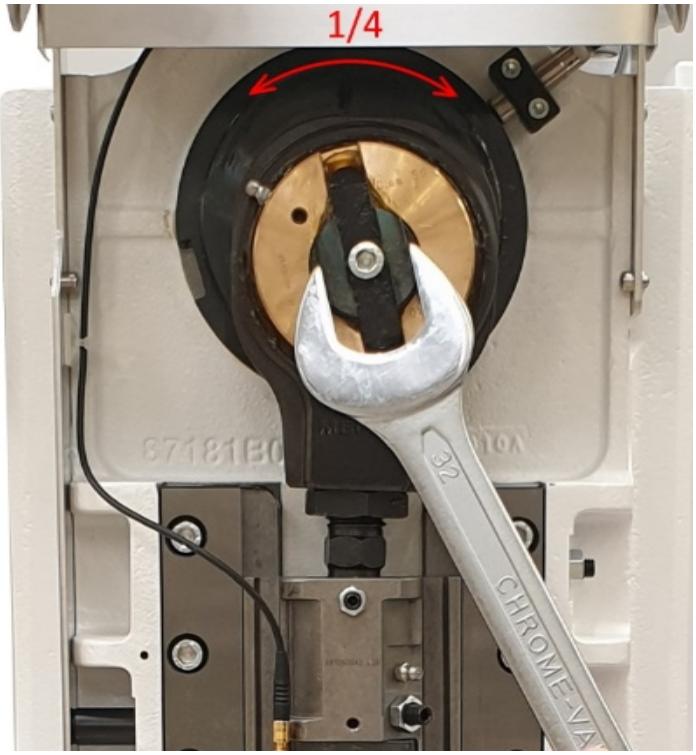




- Using the housing on the drive shaft ⑥ with the appropriate wrench, turn the crank ⑦ clockwise until the slide unit is moved downward and attach to the bottom dead centre [BDC].
- Make sure you are at BDC, observing the maximum deviation point on the dial gauge.
- Loosen the lock nut ⑧ using a wrench.
- Use a wrench and a ball screw ⑨ to adjust the height of the crimping machine (turn to the right to screw in the joint and thus increase the height; vice-versa, turn to the left to unscrew the joint to decrease the height).



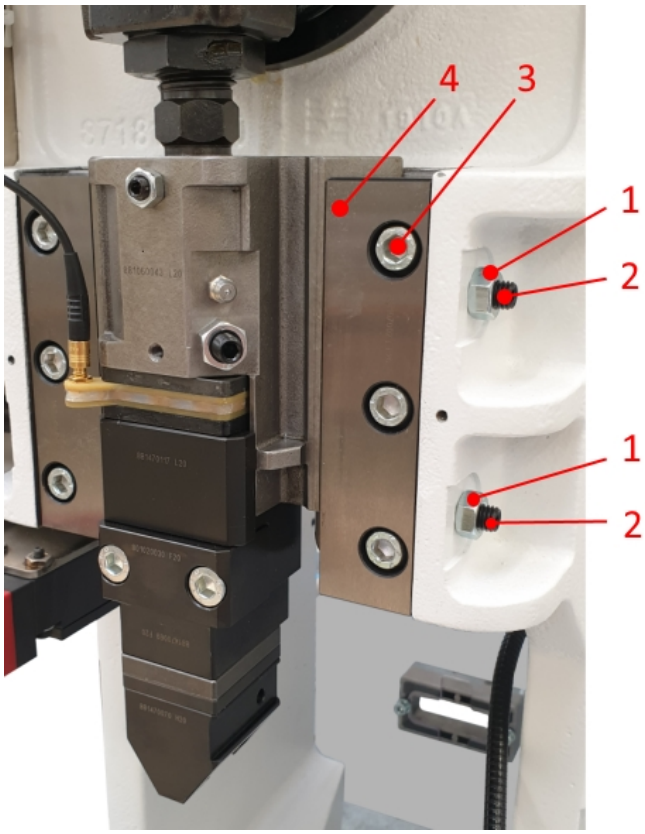
- Adjust and detect the height deviation on the comparator of the tool [the big pointer will have to make a complete turn, repositioning on "0", while the small pointer will have to pass from "2" to "1", i.e. mark the deviation of 1mm].
- To ensure the correct position, turn the wrench a ¼ turn of the crank in both directions and check on the micrometer that the maximum deviation is correct.
- Push the lock nut in manually.
- Hold the ball screw in with the wrench and tighten the lock nut with the other wrench.
- Turn the crank ¼ turn in both directions again and check the offset on the tool.
- If necessary, repeat the steps to make adjustments.



8.5.4 SLIDE/GUIDE UNIT ADJUSTMENT

To adjust the clearance between the slide and the guides:

- Centering the slide on the gibs's length.
- Loosen the nuts ① on the adjustment dowels ②.
- Loosen the screws ③ on the right guide ④.
- Tighten the adjustment dowels ② to decrease the clearance or unscrew them to increase it.
- The clearance to be obtained is 0.05 mm (0.00197 in), to be checked with a thickness gauge between the guide and the slide, both at the top and bottom, ensuring good parallelism between the two planes.
- Once adjustment has been completed, tighten the screws ③ on the right guide ④.
- Tighten the nuts ① on the adjustment dowels.

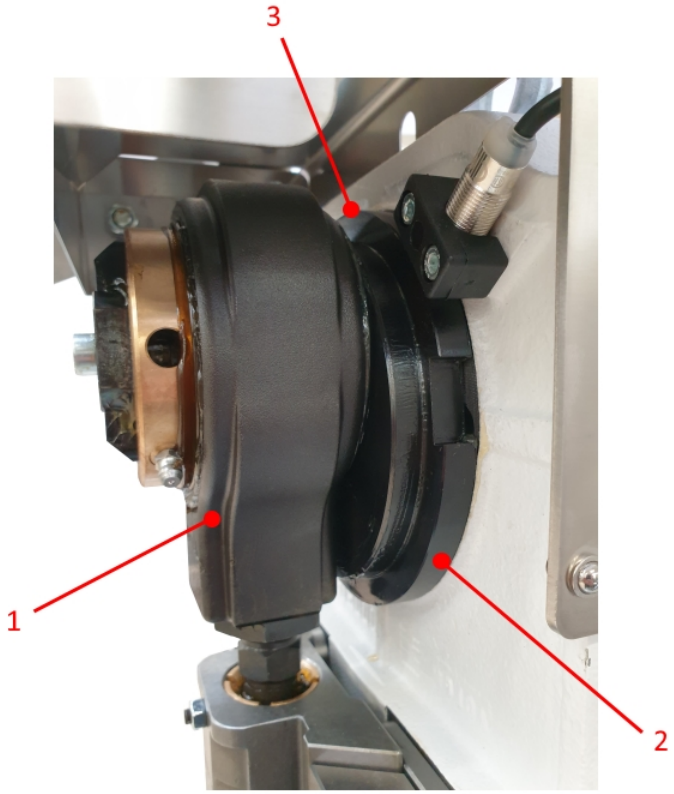


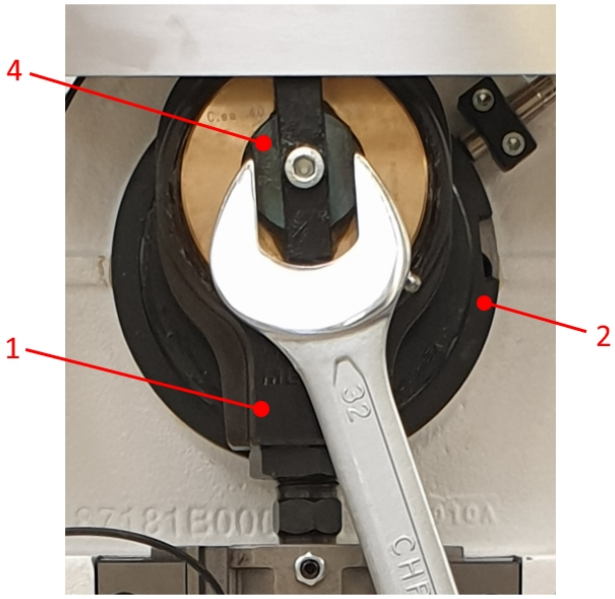
8.5.5 LIMIT SWITCH CAM POSITION ADJUSTMENT

The position of the limit switch cam, together with the proximity sensor, determine the end of the work cycle at top dead centre T.D.C.

The cam position is adjusted as follows:

- Carry out a crimping machine work cycle, letting the crank ① position itself at the final stop point (regardless of whether this is the correct position or not).
- Switch off the machine to safely access the work area.
- Take the position reference of the limit switch cam ② and counter-mark the side panel (i.e. with a marker).
- Unscrew the dowel ③ on the limit switch cam ②.
- Using the supplied wrench on the seat on the shaft ④ to turn the crank ① until the slide unit moves upwards and brings the coupling to top dead centre [TDC].
- Reposition the limit switch cam ② on the counter-marked point and tighten the dowel ③.
- Switch on the crimping machine and carry out a work cycle.
- Check that the slide unit is at top dead centre [TDC].
- If necessary, repeat the steps to make adjustments.



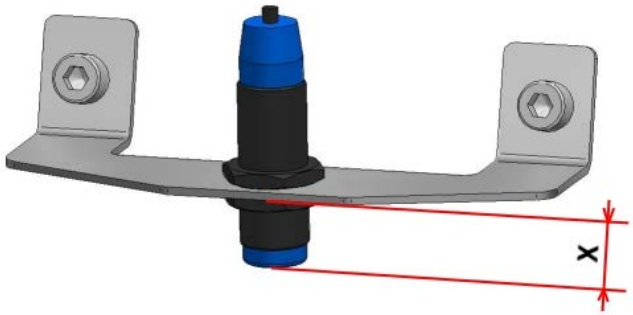


8.5.6 CAO SYSTEM ADJUSTING SENSORS

The CAO detection system consists of its sensors: the first, ultrasonic, detects the presence of the applicator, while the second, with a roller, detects the presence of the coil of terminals.
Both sensors can be changed and must be repositioned correctly as follows:

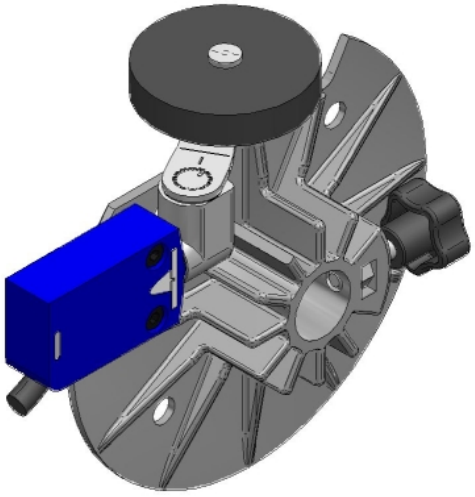
Ultrasonic presence sensor Applicator / Die

The ultrasonic sensor is positioned on a bracket inside the press frame and must be positioned at X = 20mm from the end of this (as in the image below).



Presence roller sensor Coil of terminals

The roller sensor is installed on a special flange for positioning the coil of terminals.
Check that the position of the wheel arm has an angle of 30 ° with respect to the sensor body, by viewing the two small dots on the body of the angular head (as shown in the photo below).



ADDITIONAL INFORMATION

Always refer to the use and maintenance manual of the CAO system.

ADDITIONAL INFORMATION

The ultrasonic sensor calibration operations are described in the use and maintenance manual of the Display system.

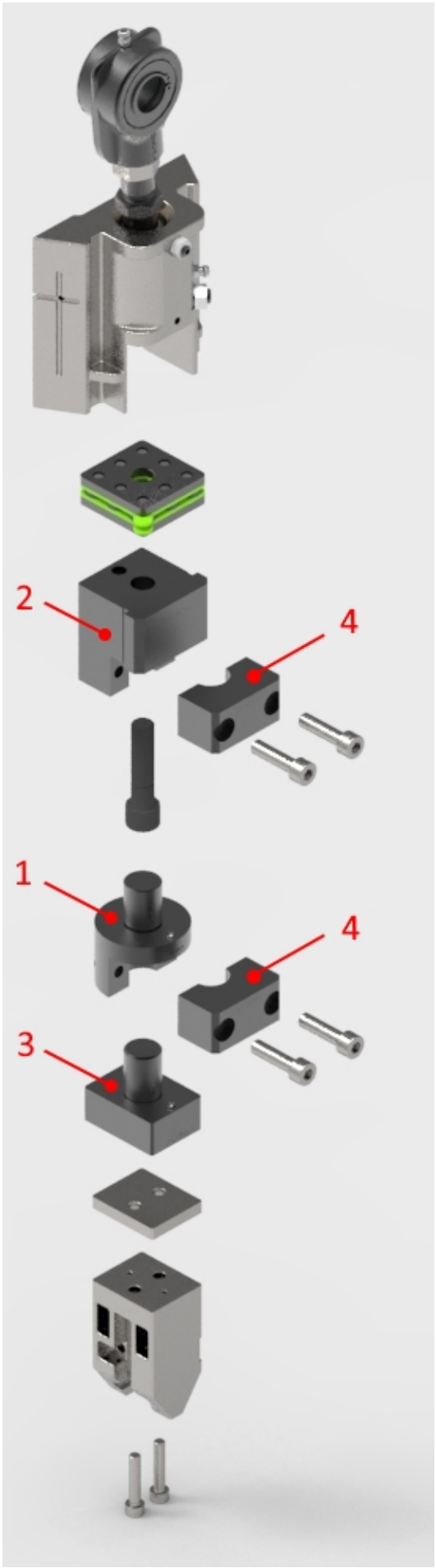
8.5.7 HEIGHT ADAPTER FOR P040i

The P040i crimping machine has a height adapter ① placed between the cell support / T attachment ② and the shank attachment ③ supported by an additional collar ④. The adapter is used to resume the length of the slide (shorter in this version of the machine).

Both the procedure for changing the working height from 135.8 mm to 212 mm (and vice versa), and the procedure for adjusting the same heights do not change.

It is necessary to pay attention to the polarization of the shank attachment and the adapter: the plug must be positioned frontally and inserted in the seat on the collar.

It is important to check the perfect coplanarity between the cell support / T attachment ② and the spacer ① and between the spacer ① and the shank attachment ③, in order to ensure a correct crimping height of the machine.



CAUTION

Each time the working height is changed, verify the correct calibration height of the crimping machine at the bottom dead centre B.D.C.

ADDITIONAL INFORMATION

Always refer to the use and maintenance manual of the equipment to be installed on the crimping machine.

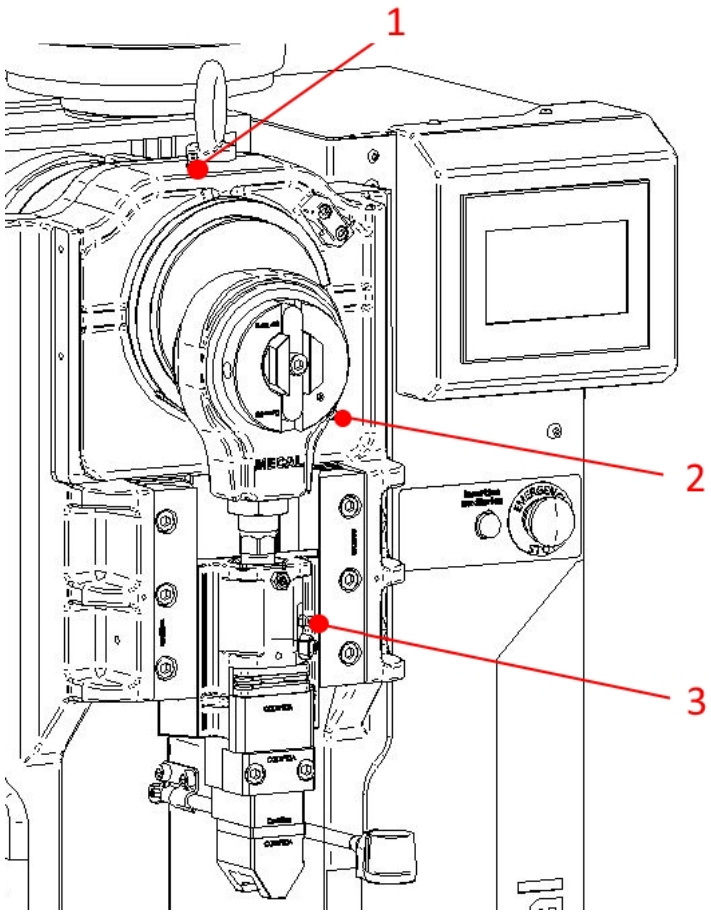
8.6 LUBRICATION

The crimping machine requires constant lubrication, therefore there are different lubrication and greasing points.

For lubrication of machine components, use:

TURMOGREASE Grease L 802 EP PLUS – Mecal code P1340 (1 Kg tin).

– Mecal code P1377 (5 Kg tin).



POS.	FREQUENCY	DESCRIPTION	LOCATION	QUANTITY	MODE
①	Monthly	Bearings on gear box shaft		2 pumps	Manual pump
②	Monthly	Crank		2 pumps	Manual pump
③	Monthly	Slide, guides and ball joint		2 pumps	Manual pump

8.7 CLEANING

Periodic and accurate cleaning allows the machine to always be kept in order and efficient.

- Clean the Lexan protections with water and non-aggressive detergent.

CAUTION

Do not use alcohol or other alcohol-based products to clean Lexan protections.

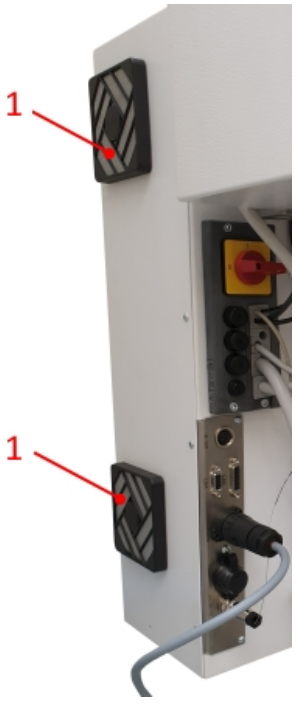
The use of alcohol-based products ruins and compromises the mechanical characteristics and functionality of the guard.

- Clean the work area with compressed air.
- Spray a film of protective oil on the applicator base and metal parts if the die is not to be used for an extended period of time.

ADDITIONAL INFORMATION

Always refer to the use and maintenance manual of the equipment to be installed on the crimping machine.

- Periodically clean the electric fan and its ventilation grille ①, located on the electrical panel, with compressed air.
  Replace the filters if deteriorated.



8.8 MAINTENANCE SHEETS

To guarantee the reliability of the machine, you need to ensure regular and effective maintenance and constant control of indicator instrument parameters.

Maintenance, troubleshooting and repair operations are only allowed to be performed by authorised personnel.

FREQUENCY	DESCRIPTION
At each applicator installation	Clean the applicator base of any machining residues.
At each die installation	Clean the die base of any machining residues
At the end of the work shift	Clean the work area with compressed air and remove any machining residues.
Every 900 hours of operation	Check the conditions of wear on the sliding parts. For example the Guides.
Daily	Clean the control unit and the Lexan protections.
Monthly	Periodically clean the fan and its ventilation grille, located on the electrical panel, with compressed air. Replace it if it has become deteriorated.
Every six months	Make sure that no fasteners have become loose.

MAINTENANCE LOG

DATE	OPERATOR	DESCRIPTION OF INTERVENTION

8.9 SPARE PARTS

Below is the list of components subject to wear over time (indicated with U) and those for which replacement is recommended (indicated with R).

CAUTION

Use original spare parts only. Replacement with non-original spare parts could compromise machine functionality.

ADDITIONAL INFORMATION

To order a spare part from the Manufacturer, contact him/her as indicated in paragraph 1.2 (SUPPORT).

8.9.1 MECHANICAL SPARE PARTS

U/R	DESCRIPTION	MANUFACTURER	QUANTITY INSTALLED	QUANTITY RECOMMENDED
R	Guide	Mecal 881070023	2	2
R	Slide (complete assembly)	Mecal 50C000082	1	1
R	Slide bearing w/o ring (in the slide assembly)	Mecal 880500040	1	1
R	Shaft bearing w/o ring (in the shaft assembly)	Mecal 880500058	1	1
R	Frame bearing w/o ring	Mecal 880500059	1	1

8.9.2 ELECTRICAL SPARE PARTS

U/R	DESCRIPTION	MANUFACTURER	QUANTITY INSTALLED	QUANTITY RECOMMENDED
R	Limit switch proximity sensor	Mecal 880630032	1	1
R	Interlocked safety switch	Mecal 880580004	1	1
R	Interlocked safety key	Mecal 881270002	1	1
R	Foot pedal switch	Mecal 880490000	1	1
U	Electric fan filter		2	2
U	Mains supply fuse 20A GT	Mecal 870270055	3	3
U	Low voltage supply fuse 1A FF	Mecal 870270018	1	1

8.10 TROUBLESHOOTING AND PROBLEM RESOLUTION

PROBLEM	POSSIBLE CAUSE	SOLUTION
The machine does not start and the power light is off.	Power supply not connected to the mains.	Connect the power supply to the mains.
	Padlockable disconnecting switch in the OFF position (O).	Move the disconnecting switch to the ON position (I).
	Protection circuit breaker tripped.	Reset.
	Blown fuses.	Check fuses for continuity and replace if necessary.
The machine does not start and the power light is on.	The emergency button has been pressed.	Restore machine status.
	The crank is not in position at top dead centre T.D.C.	Follow the procedure to restore the initial mode.
The machine does not stop at top dead centre TDC and does not start the next work cycle.	The machine has been put into emergency status during the work cycle o.	Restore machine status.
	The machine limit switch is not correctly adjusted.	Adjust the cam position.
	The machine limit switch is faulty.	Contact the Manufacturer.
	The inverter is faulty.	Contact the Manufacturer.
The machine does not stop at top dead centre TDC and restarts upon the next command to start the work cycle.	The inverter is faulty.	Contact the Manufacturer.

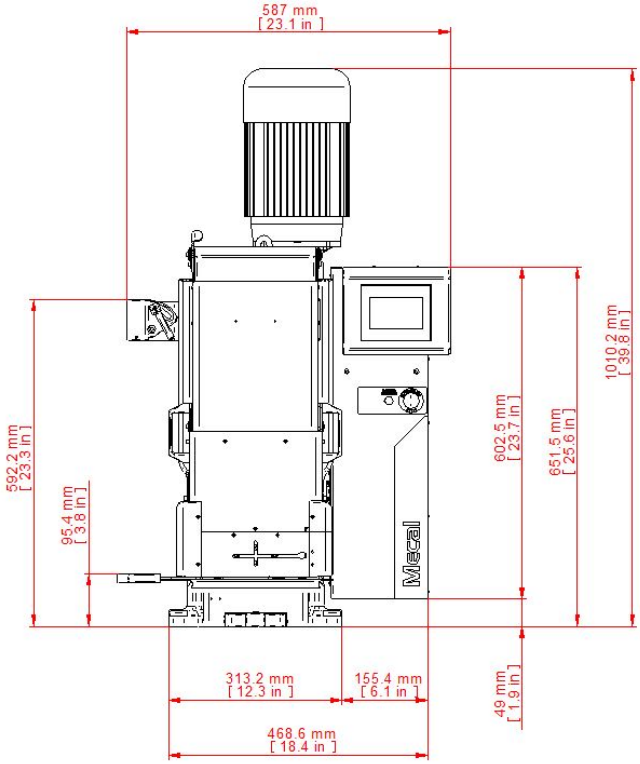
9. ATTACHED DOCUMENTATION

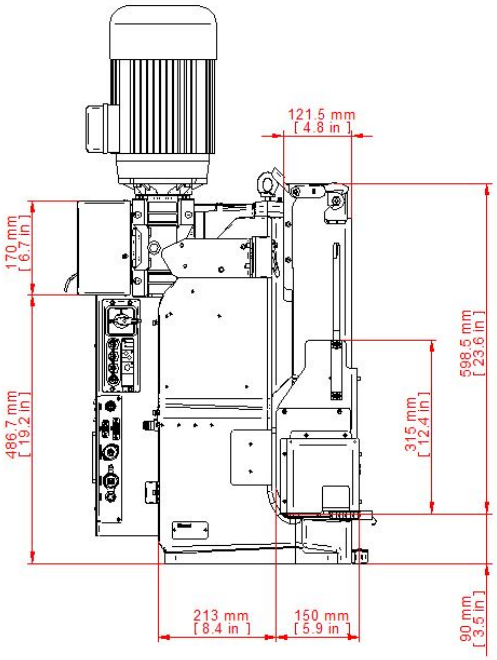
The following documents will be inserted at the end of this manual.

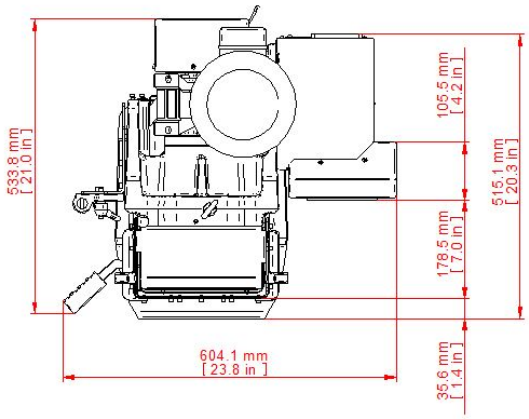
ATTACHMENT NR.	DESCRIPTION
9.1	Machine layout and detail of the working height
9.2	Exploded diagram of the machine
9.3	Wiring diagram
9.4	Pneumatic diagram

9.1 LAYOUT

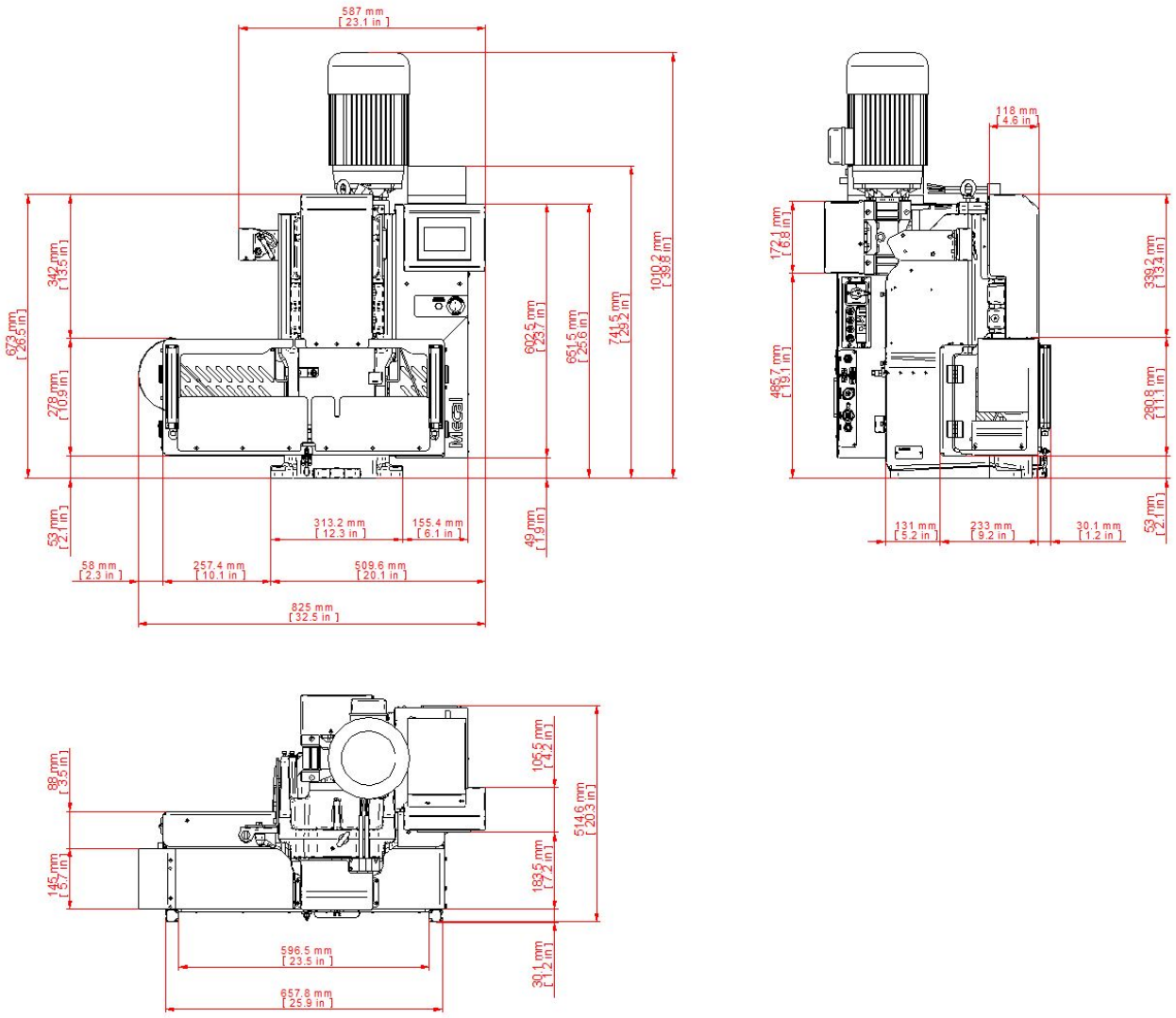
9.1.1 TILTING COVER



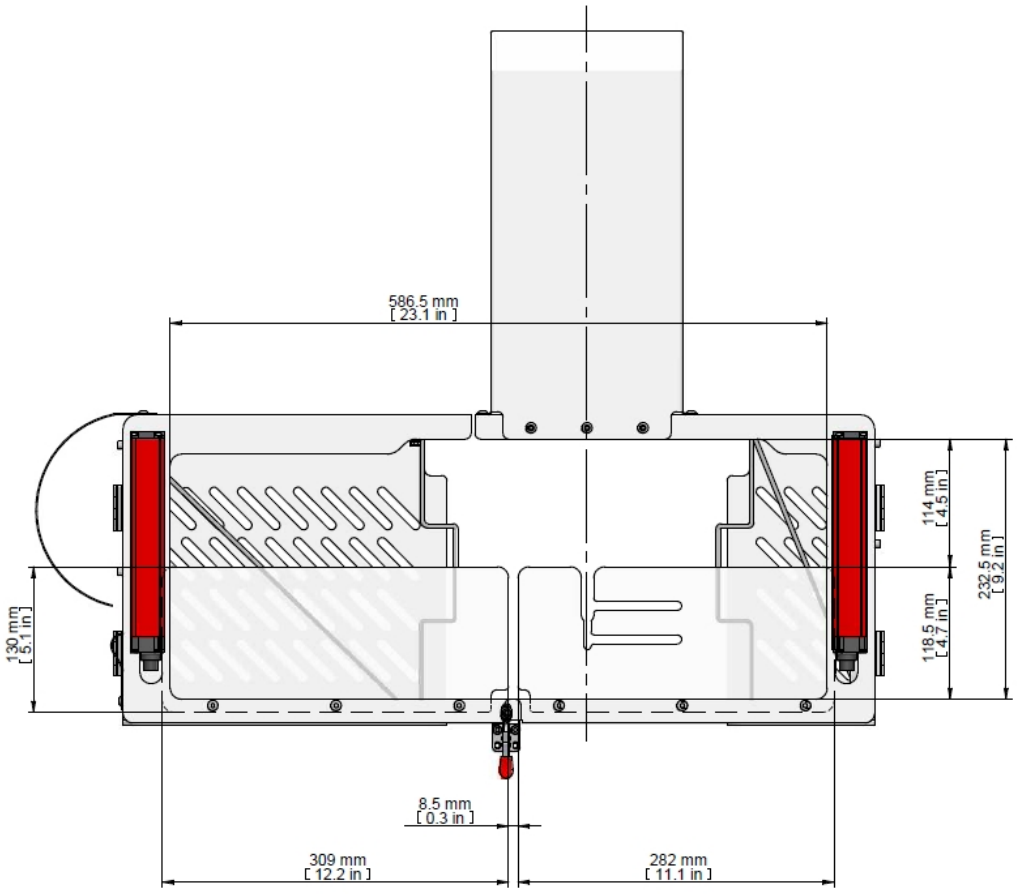




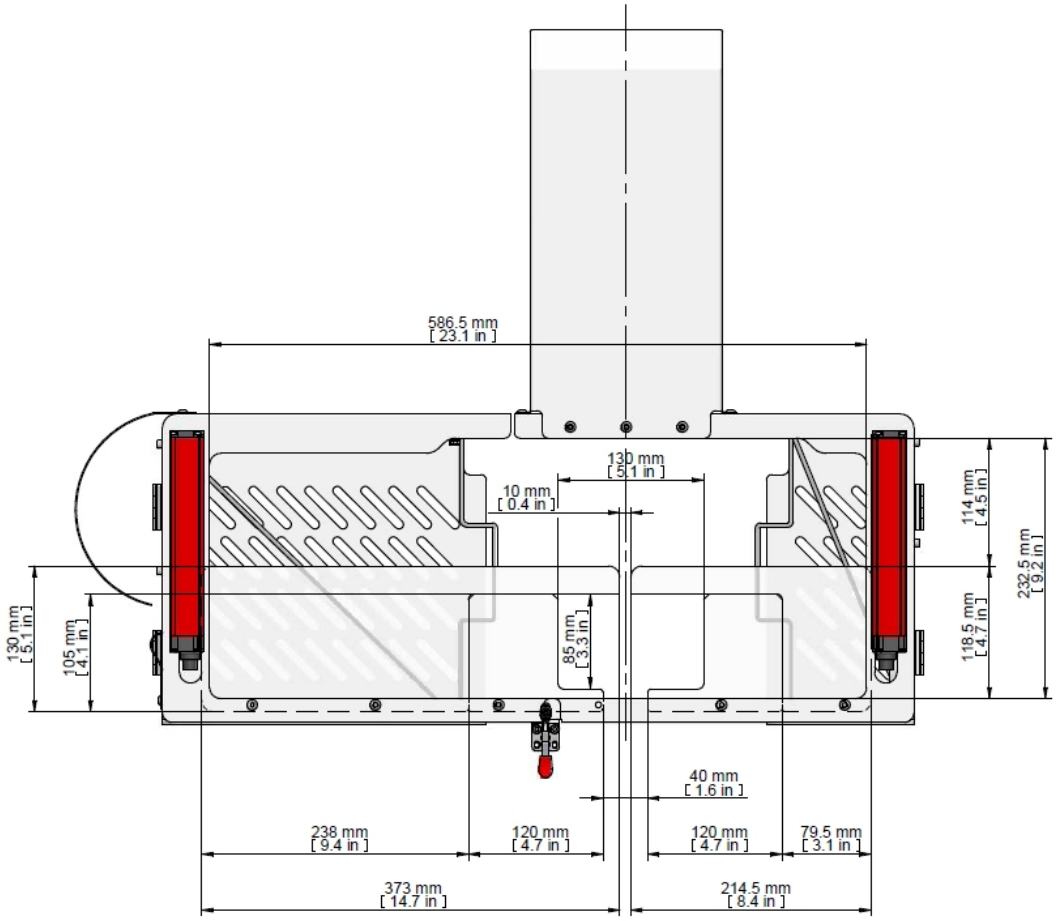
9.1.2 BARRIERS COVER



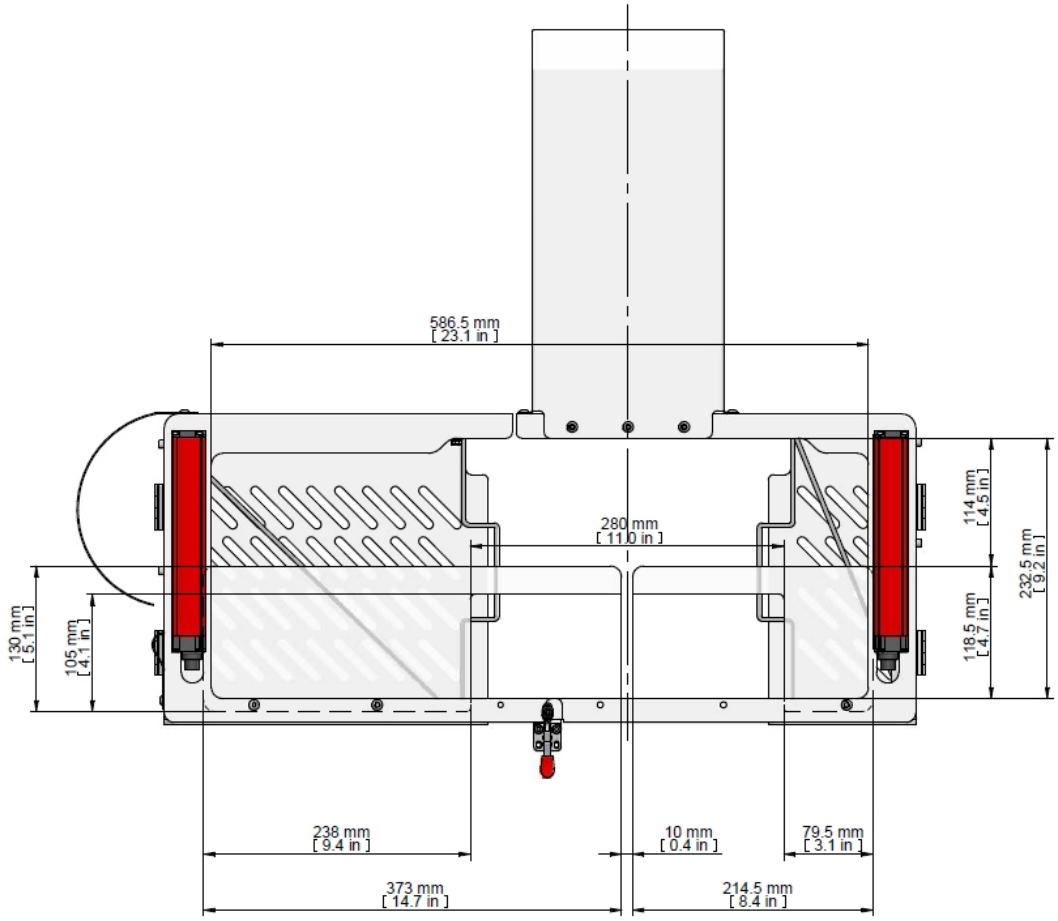
Detail of front protections for standard applicator



Detail of front protections for FMS applicator

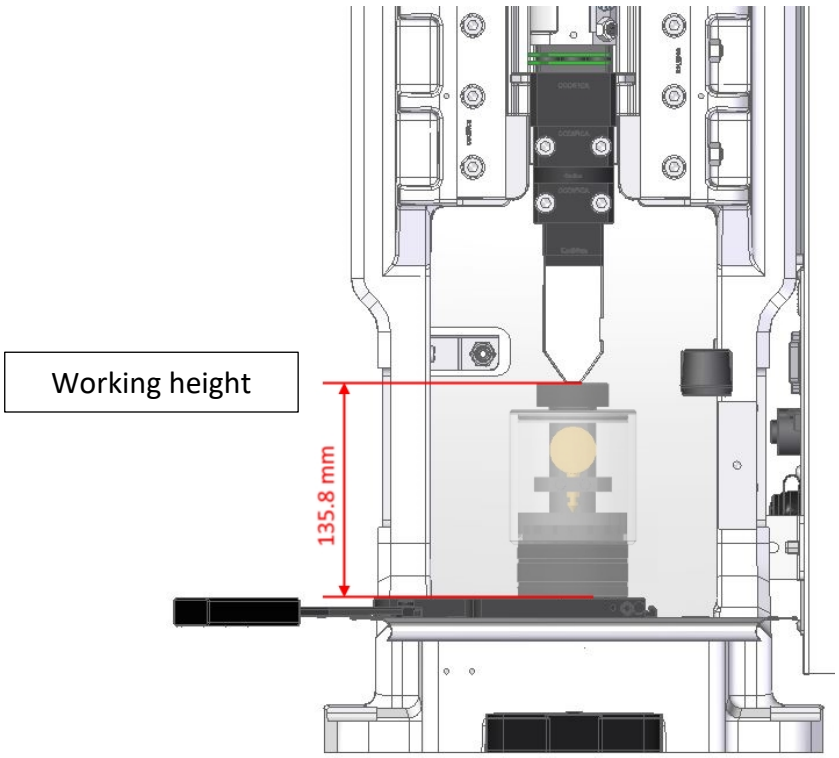


Detail of front protections for MSES mold

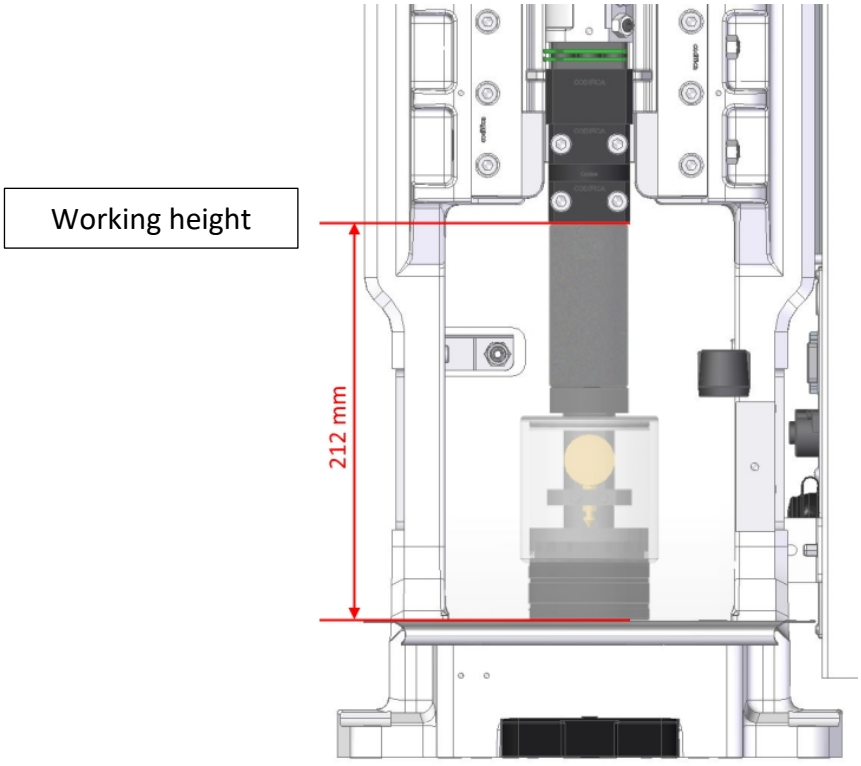


9.1.3 WORKING HEIGHT

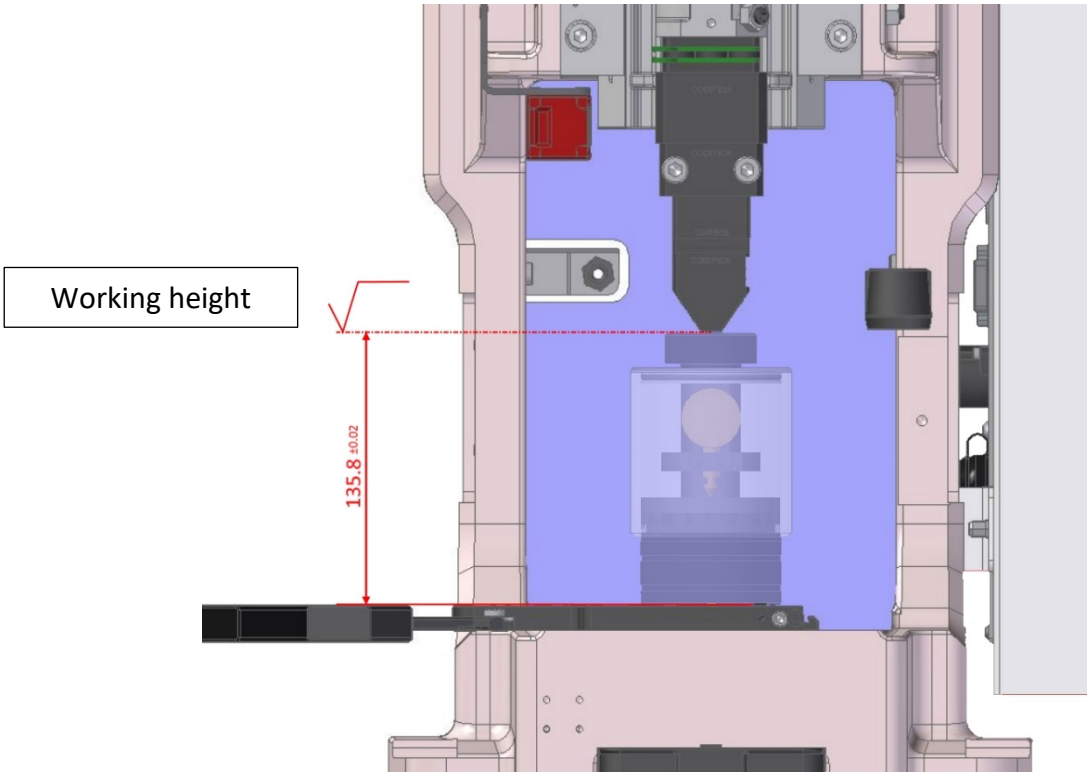
Detail of the working height 135,8 mm for applicator insertion on P040i crimping machine (with spacer):



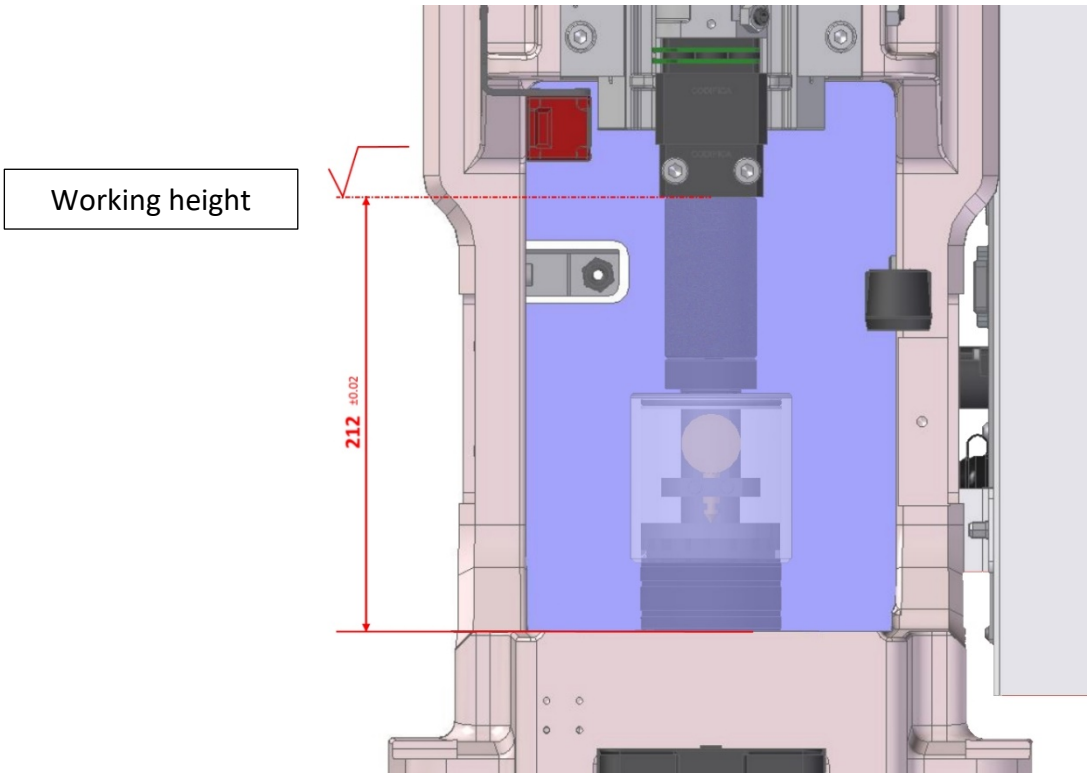
Detail of the working height 212 mm for die insertion on P040i crimping machine (with spacer):



Detail of the working height 135,8 mm for applicator insertion on P080i and P120i crimping machines:



Detail of the working height 212 mm for die insertion on P080i and P120i crimping machines:



9.1.4 MACHINE FIXING INTERFACE

Below is the position of the holes for fixing the seamer to the bench: use n.4 M10 screws.