

OPERATING AND MAINTENANCE MANUAL

mio

Electronic engraving machine



M_M10_EN_A - Last updated: 03/2018 - Translation of the French original document

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A. Foreword

1. Appreciation

Thank you for choosing M10 - Gravograph.

Gravotech is pleased to count you among the users of its engraving and traceability solutions.

For help, contact Gravotech.

For more information on products, visit www.gravograph.com website.

2. Information



To ensure security and productivity, read this manual before starting-up the equipment. It provides details about the installation and use of the equipment.

Keep this manual in case you need to refer to it.



For the attention of users having an individual cardiac assist device fitted:

Our equipment is designed and manufactured with the greatest care in order to guarantee their compliance with the EMC Directive currently in force. This means that the levels of electromagnetic emissions produced by this equipment when in operation are limited and do not exceed the thresholds defined by the Directive.

However, multiple factors make it impossible to guarantee the total absence of risk for users having a cardiac assist device fitted. Consequently, it is recommended that standing for a prolonged period within less than 1 m (3.281 ft) of an operating machine should be avoided.

B. Legal notices

Last updated: 10/15

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The Product's specifications are altered by (i) any Product's modification or alteration, (ii) any adaptation and installation of accessories that are not recommended by Gravotech, (iii) the integration of a control system and (iv) the connection to an external device. Such specifications' alterations may lead to the non-compliance of the Product with applicable rules and standards. Shall the Product be non-compliant, the person in charge of the Product's installation shall be responsible of the final workstation's compliance. In no event, Gravotech shall be liable for any damages arising from such non-recommended or unauthorized Product's alterations. It is precised that the warranty shall not apply in such case.

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C. Regulation observance

Last updated: 02/2018

EC declaration of conformity or declaration of incorporation supplied with the machinery

Type of machine	Directives - Standards
<p>Dot peen marking: Machine XF500p, XF500m, Impact p, Impact eZ p, Impact m, Impact eZ m P5000PN, P5000EM</p> <p>Scribing marking: Machine B-Engraver, M10, M10 Jewel, M20 Pix, M20 Energy RingCube, TagCube</p> <p>Sharpening by grinding: Machine CG30</p> <p>Bevelling: Machine B4, B6</p> <p>Engraving by milling: Machine IM3, IF3 M20, M20 Jewel, M20 ABC, M20 Pen, M20 Beauty Cube, M20 V3 M40, M40G, M40 ABC IS200, IS400, IS400 Volume IS6000, IS7000, IS8000 - XP - XP Milling</p> <p>Hot foil stamping: Machine M20 Artfoil</p> <p>Dot peen marking: Transportable machinery - Partly completed machinery XF530p, XF530m, XE320Cp, XE320Cm</p> <p>Dot peen marking: Partly completed machinery XF510Cp-Sp-Dp, XF510Cm-Sm-Dm, XE310Cp-Sp</p> <p>Scribing marking: Partly completed machinery XF510Cr-Sr-Dr, SV510</p> <p>CCU, Rack, TouchPad UC500, UC500 SV, UC300, UC Laser Racks IS</p> <p>Laser fume extractor ES10, ES20, ES30, ES40, ES50 LE120HP, LE140HP, LE150HP, LE190HP, LNI900</p> <p>Accessory: Partly completed machinery APF Rotary, APF Laser PFD500 TAG3500 Cylinder attachment DMC15, DMC25, DMC25PN, DP3500, DP4500, DP4500PN RD1, RD2, RDM</p>	<p>- Low voltage: 2014/35/EU - EMC: 2014/30/EU - RoHS 2: 2011/65/EU</p>
<p>Dot peen marking: Portable machine XM700</p>	<p>- Low voltage: 2014/35/EU - EMC: 2014/30/EU - RoHS 2: 2011/65/EU - Cells and batteries: 2006/66/EC</p>
<p>CO2, Yag and fiber laser marking: Machine (gantry) LS100 Energy, LS100 Ex Energy, LS900 Energy LS100, LS100 Ex, LS900, LS900 XP, LS1000XP LS100 Ex Fibre, LS900 Fibre LS900 Edge</p> <p>CO2, Yag and fiber laser marking: Machine (galvo) LW1, LW2 Laser Solution Hybrid-Series (Energy), Laser Solution Green-Series (Energy), Laser Solution CO2-Series (Energy)</p>	<p>- Machinery: 2006/42/EC - Low voltage: 2014/35/EU - EMC: 2014/30/EU - RoHS 2: 2011/65/EU</p> <p>- Safety of laser products - Part 1: Equipment classification and requirements: EN 60825-1:2008 - Safety of laser products - Part 4: Laser guards: EN 60825-4+A1+A2:2006</p>
<p>CO2, Yag and fiber laser marking: Partly completed machinery (galvo) – Class 4 Laser Solution Fiber-Series (Energy)</p>	<p>- Low voltage: 2014/35/EU - EMC: 2014/30/EU - RoHS 2: 2011/65/EU</p> <p>- Safety of laser products - Part 1: Equipment classification and requirements: EN 60825-1:2008 - Safety of laser products - Part 4: Laser guards: EN 60825-4+A1+A2:2006</p>

D. Introduction

1. Presentation

The M10 machines are electronic engraving machines.

- They are provided with a keypad for controlling the machine.
- The files to be engraved are transferred from the software to the engraving machine.
- The object is held in position on a Gravogrip mat.
- Engraving is performed by the tool holder assembly (diamond point).

Function	Engraving area
Flat engraving (diamond engraving)	70 mm (2.756 in) x 60 mm (2.362 in) (maximum)

2. Identification of the marking equipment

The marking equipment is identified by:

- 1 identification plate on the rear face

Have the model and serial number of the equipment available when contacting Gravotech.

E. Unpacking



Unpack the machine with 1 operator(s).

1. Unpacking

1. Remove the machine from the packaging (carrying handles).



2. Unpack the accessories.









3. Check that nothing is missing from the parcel. If anything is missing, contact Gravotech.

Keep the packaging in order to move the machine safely. This packaging is designed to protect the machine during shipping (return for repair...).

The packaging complies with European recycling standards.

Unpacking

2. Package contents

	M10
	DVD containing the instruction manual
	Power cable + machine power supply unit (24 V - 100 W)
	Screwdriver
	Allen key x2 (1.5 mm (0.059 in) - 3 mm (0.118 in))
	Gravogrip mat + square
	Program ABC

F. Safety

1. Recommendations and safety

■ Personnel safety



Turn off the machine before beginning any cleaning, maintenance or repair procedure.

- The machine is designed for light engraving only and under no circumstances should it be used for other applications.
- Do not use this machine for routing or intensive cutting operations. Do not use this machine for wood work.
- Do not use this marking equipment in an explosive environment.
- Never hold the materials for engraving by the hands. Use only Gravograph clamping systems designed for the machine.
- Do not start engraving without first ensuring that the object to be engraved is securely clamped.
- Never take hold of the material for engraving when engraving is in progress.
- Interrupt engraving by means of the function provided for this purpose on the machine control panel.
- Keep away from the area above the machine. Keep clear of the tool-holder.
- Ensure that people are kept clear of the area of travel of the moving parts of the machine and that no objects risk obstructing their movement.
- Warning: Hazardous moving parts - Keep fingers and other body parts away. To prevent any risk of crushing, avoid placing the hands in the locations identified.

Safety

■ Handling the machine

- Any operations on the machine must be carried out under the responsibility of an adult. Do not allow children to touch the machine, leads or cables.
- Never move the tool holder manually, except in the event of a mechanical blockage of the machine.
- In the event of an extended period of non-use, unplug the power cable and protect the machine.
- Never pour or spill liquid on the machine (drinks, cleaning products, etc.) except where recommended by Gravotech.
- Do not place any object on the machine other than the object to be engraved.
- Use the machine with Gravograph tools only.
- This machine is designed for a single user only. Do not allow its operation by multiple users at the same time.

■ Required safety labels

 A yellow triangular warning sign with a black border. Inside the triangle, there is a black silhouette of a hand being crushed between two horizontal lines, with a small downward-pointing arrow above the hand.	<p><i>Warning: Crushing of hands</i></p>
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G. Description of the machine

1. Front view of the machine



1. *Control panel (9-key flexible keypad)*
2. *Frame*
3. *Window*
4. *Engraving table*
5. *Door*

Description of the machine

2. Rear view of the machine



Each connection meets one of the following safety levels:





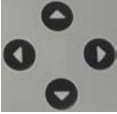





- Dangerous voltage
- SELV (Safety extra-low voltage)



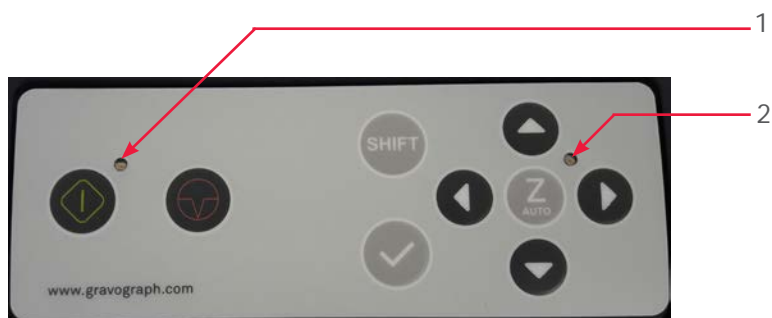
1. *General stop button*
2. *Port: USB - SELV*
3. *Power inlet / outlet (24 V - 100 W) - SELV*

Description of the machine

3. Control panel

	Start	Engraving start
	Pause	Marking suspended
	"Check" key	
	Z	Activation/deactivation of Z axis travel
	Joystick	Head movement (X, Y, Z)
	Pause + Left arrow	Origin: adjustment (X, Y)
	Pause + Z	Origin: adjustment (Z)
	Shift + Z	Automatic ZRef.
	Shift + Up - Down arrows	Door open
		Door closed

■ Indicator light function



1. Indicator light on = machine powered on
2. Indicator light on = travel of the Z axis

H. Recommendations for installation



Turn off the machine before any intervention (put the On/Off switch in the "O" (Off) position).

1. Physical installation

- Place the machine on a horizontal, stable and clean surface that can support 100 kg (220.462 lb) or more.
- Place the machine in a clean, ventilated environment.
- Ambient light is enough to light the equipment properly.
- Arrange the work surface for rapid and easy access to each external part of the machine and, if necessary, to the main machine stop button.
- Do not obstruct the movement of the moving parts of the machine.



Make sure the connector screws are properly tightened to prevent the cables from becoming disconnected while the machine is switched on. This could cause permanent damage to the circuit boards.

The power cable must always be easily accessible (power shut-off device).

- Protect the equipment against:
 - damp (rain, snow, condensation etc.)
 - heat (exposure to full sun, heating etc.)
 - sudden changes in temperature
 - dust (extraction duct)
 - spillages of liquids onto the electrical unit, cables and connections, and all other parts of the machine; except in situations recommended by Gravotech (lubrication)
 - vibrations
 - electrical/electronic radiation

Recommendations for installation

2. Electrical installation

The connection to the single phase power supply is made with a standard, 3 pin plug with grounding. Grounding must be done according to the regulations in effect to ensure the safety of the personnel.

To avoid interference problems due to the external environment, observe the following:

- Connect the machine direct to a mains power line and avoid connecting more than one device to that line (by plugging several devices into the same mains socket or into a multi-way adapter). Exception: Where equipment is connected, such as a computer and the machine, supply power to the devices through the same mains power line.
- Do not allow inductive or capacitive devices to be connected to the same mains power line as the machine (motors, solenoid valves, chargers, etc.).
- Avoid the installation of manual or automatic switching systems on the same mains power line as the machine (relays, timers, programmers, automatic circuit-breakers, automatic switches, etc.).
- Check that devices in the vicinity of the machine meet the standards for electromagnetic interference. Read the technical data sheet for each device. If they are non-compliant, move them as far away from the machine as possible.
- Use the Gravograph accessories.



Always switch the machine off before connecting or disconnecting a cable or optional accessory.

I. Connections - Installation

1. Connections

■ Power supply connection

1. **Connect the power supply unit mains lead to the socket connection on the machine.**
2. **Connect the power supply unit mains lead to the mains socket connection.**

To cut off the power to the machine if there is a serious problem, unplug the power cable or operate the On/Off switch (general stop button).

■ Machine / PC connection

The machine installation and usage procedure is based on a PC-type computer running Windows®. For help, contact Gravotech.

1. **Switch off the machine.**
2. **Connect the USB cable to the machine's USB port.**
3. **Connect the USB cable to the PC's USB port.**

2. Installation

■ Switching on the machine

1. **Place the switch in the "I" position (On).**

The machine emits an audible signal.

The power LED lights up.




Leave the machine powered on, even if it is only going to be used at intervals.

Connections - Installation

■ Resolution of the problems

If the machine does not switch on:

- Check that the power cord is correctly plugged in to both the machine and the power supply.
- Check that there is power to the mains plug.

	<p>If the machine emits a long beep followed by a short beep and there is no movement, call a Gravotech technician.</p>
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■ Power down

1. Set the general stop button to the "O"(Stop) position.


Switch off the machine in the following situations:

- when the operator is permanently leaving the machine
- in the event of physical damage (something is dropped on the machine, fire, a liquid is spilled on the machine, etc.)
- mechanical/electrical/electronic faults suggesting a breakdown
- if there is a major problem or the machine is jammed mechanically
- the machine is jammed on the part to be engraved/marked
- the machine is jammed on an object in the work area
- forced restart
- external/internal cleaning

■ Restarting

If the machine or the operating program locks, the machine may need to be restarted.

1. **Switch off the machine.**
2. **Wait approximately 30 s.**

	<p>This waiting time must be respected. It prevents an electric surge likely to damage the machine's power supply.</p>
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3. Switch on the machine.

■ Program installation

Refer to the user manual for the ABC / Gravotouch / Gravostyle program.

J. Using the machine

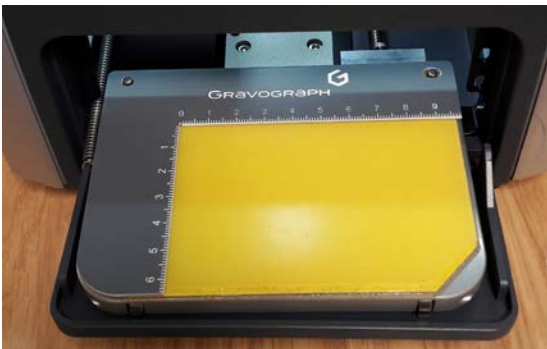
1. Transfer of the composition to the machine

1. **Switch on the machine.**
2. **Select (program):**
 - ZRef auto function
 - origin top left corner
or
center origin
3. **From the program, transfer the composition to the machine.**

2. Positioning the object to be engraved

The length of the object must never exceed that of the square.

1. **Open the front door:**  + .



2. **Position the plate in the top left corner of the engraving table.**



3. **Check that the object is correctly positioned. It must adhere to the Gravogrip mat to prevent it from moving.**

Using the machine

3. Start-up engraving

Engraving is launched from the control panel on the machine.

- 1. Check that the object is correctly positioned in the engraving area.**
- 2. Press the key: Start (control panel).**

The door closes automatically. The tool holder moves at a safe movement speed to the first engraving point and starts the engraving.


Automatic ZRef: The spindle moves down until the diamond tip touches the plate. When the position of the ZRef. has been stored, engraving starts.

In order to achieve a faster movement speed, press the Start key until the first engraving point is reached.

- **In the event of a problem, press the Pause button.**
The machine pauses momentarily.
To resume engraving, press the Start key.
- **To stop engraving completely, press one of the arrows on the joystick.**
- **To accelerate the movement speed of the spindle during engraving, press the Up arrow.**
- **To slow down the movement speed of the spindle during engraving, press the Down arrow.**

K. Preventive maintenance

1. General maintenance

	<p>Unplug the power supply plug before beginning any cleaning or maintenance operation.</p> <p>The mains power cable must be replaced immediately if it is cut or crushed, cracked or a conductor is stripped bare.</p>
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The machine's maintenance needs depend on the type of material used, the quantity of material removed, frequency of operation, environment and the effectiveness of the air extraction system. It is the user's responsibility to define them.

Dust and debris that accumulate on the machine's components can cause irregular or imprecise engraving, or the loss of the engraving position and the premature failure of components.

Regularly cleaning the machine improves its operation, extends the life of parts and reduces the risk of failure.

Recommendations: Check and, if necessary, clean the machine every 8 hours of engraving/marketing or cutting.

For help, contact Gravotech.

No internal parts of the machine require user intervention. Routine maintenance only involves external cleaning of the engraving area.

To clean other parts of the machine, call a Gravotech technician.

Preventive maintenance

2. Adjusting the machine

The center of the engraving area of the machine must be aligned with the clamping system.

The M10 machines have a machine reference point adjustment system which can be deployed by the user.

Adjust these settings every 3 months or whenever the machine has been moved.

■ Setting the table zero point

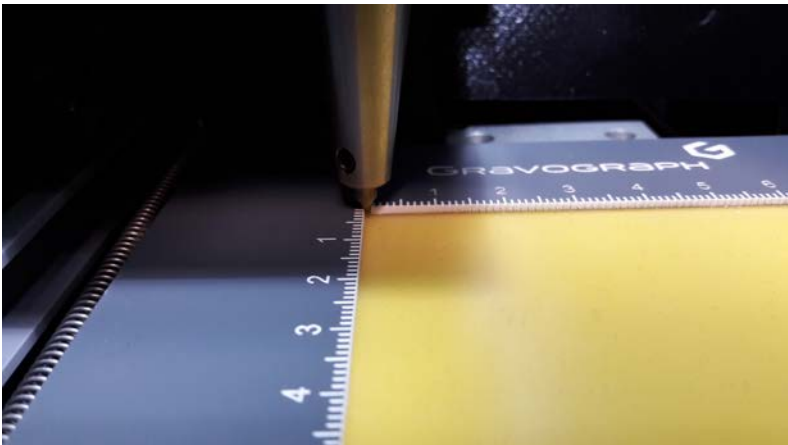
1. Press simultaneously on the 2 keys: Pause + Left arrow.

The tool carrier is moved to the top left corner of the table for the table zero point setting operation.

2. Set the zero point in the Y axis of the machine using the following keys: Up - Down arrows.

3. Set the zero point in the X axis of the machine using the following keys: Left arrow - Right arrow.

4. Store the position of the XY zero point by pressing the "Check" key for 3 seconds. The machine emits an audible signal.



Preventive maintenance

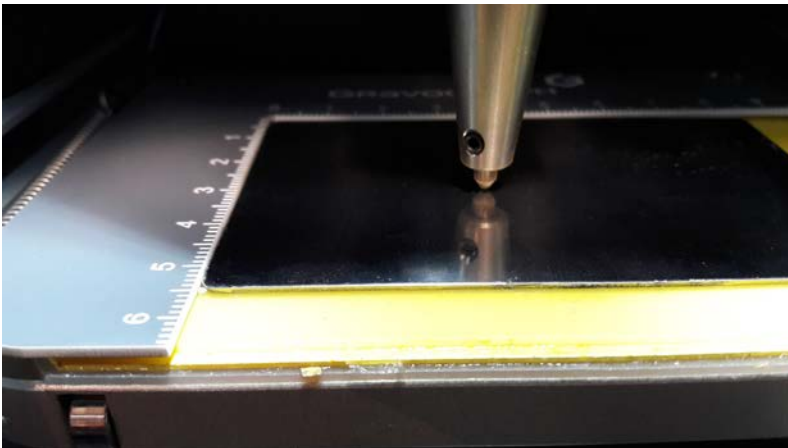
■ Adjusting the machine in Z

1. **Switch on the machine.**
2. **Position a plate to be marked.**
3. **Press simultaneously on the 2 keys: Pause + Z.**

The tool holder moves to the center of the table.

The spindle moves down until the diamond tip touches the plate.

4. **Set the zero point in the Z axis of the machine using the following keys: Up - Down arrows. Lower the spindle until the tool just comes into contact with the material.**
5. **Store the position of the Z zero point by pressing the "Check" key for 3 seconds. The machine emits an audible signal.**



L. Technical specifications

1. Physical characteristics

Dimensions (L x w x h): machine	225 mm (8.858 in) x 255 mm (10.039 in) x 290 mm (11.417 in)
Net weight: machine (no accessories)	7.4 kg (16.314 lb)
Dimensions (L x D x H): with packaging	390 mm (15.354 in) x 290 mm (11.417 in) x 480 mm (18.898 in)
Weight: with packaging	9 kg (19.842 lb)
Engraving area (useful surface area)	Maximum: 70 mm (2.756 in) x 60 mm (2.362 in)
Object to be engraved	Dimensions: 120 mm (4.724 in) x 80 mm (3.150 in) (maximum) Height: 40 mm (1.575 in) (maximum)
Travel distance Z	20 mm (0.787 in)
Surface flatness	< 0.1 mm (0.004 in)

2. Engraving characteristics

Automatic adjustment of the Z origin (automatic ZRef.)	Yes
Engraving tool(s)	Diamond point Diameter: 3.17 mm (0.125 in)
Engraving precision along XY	Maximum: < 0.1 mm (0.004 in)

■ Movement speed

Movement speed: XYZ No load (maximum)	25 mm (0.984 in)/s
Movement speed: XYZ Diamond engraving (maximum)	25 mm (0.984 in)/s
Repeatability	0.05 mm (0.002 in)

3. Noise emission of the machine (ISO 11201 standard)

L_{Aeq} - when awaiting engraving	< 63 dB (A)
L_{Aeq} - during nominal engraving	< 63 dB (A)
L_{pc} peak - peak at rated engraving	< 84 dB (C)

Technical specifications

4. Electrical characteristics

Electronics	Integrated
Nominal voltage / Type of current	External power supply unit Input: AC 100 - 240 V Output: 24 V
Absorbed current	Maximum: 1.0 - 0.4 A
Frequency	50-60 Hz
Absorbed power	35 W

5. Environment

Operating temperature	5 °C (41 °F) - 40 °C (104 °F)
Storage temperature	-5 °C (23°F) - 45 °C (113 °F)
Humidity level	20 - 80 %

6. Connection(s)

Connection to computer	USB
Power connector	Jack
Control panel	Tactile dome membrane
Number of keys	9
Screen	No