



**GRAVOGRAPH**

## User Manual

# M40<sup>ABC</sup>

**Electronic Engraving Machine**

**First Contact**



Before installing and using this machine, you must read this user guide carefully. Keep it in a safe place, in case you need to refer to it later.



GravoTechMarking SAS reserves the right to modify the information contained in this document without notice.

TYPE OF MACHINE	:	Electronic Engraving Machine
MANUFACTURER	:	GRAVOTECH MARKING SAS BP 15 - Z.I. - 10600 LA CHAPELLE SAINT LUC - FRANCE

Importer's address

This publication and its contents are proprietary to GravoTech Marking SAS (Gravograph is a trademark), and are intended solely for the contractual use of GravoTech Marking SAS customers.

While reasonable efforts have been made to assure the accuracy of this manual, GravoTech Marking SAS shall not be liable for errors contained herein or for incidental or consequential damage in connection with the furnishing, performance, or use of this material.

GravoTech Marking SAS reserves the right to revise this manual and make changes from time to time without any obligation by GravoTech Marking SAS to notify anybody of such revision or changes.

Gravotech Marking SAS can not be held liable for any problems arising out of the application or use of any products, circuits, or software described herein. Neither does it convey a license under its patent rights nor the patent rights of third parties.

GravoTech Marking SAS provides no warranties whatsoever on any software used in connection with a Gravograph Engraving System, express or implied. Neither does it guarantee software compatibility with any off-the-shelf software package or any software program that has not been written by GravoTech Marking SAS.

Intended use of this system must be followed within the guidelines of this manual. In no event will GravoTech Marking SAS be liable for any damages caused, in whole or in part, by customer, or for any economic loss, physical injury, lost revenue, lost profits, lost savings or other indirect, incidental, special or consequential damages incurred by any person, even if GravoTech Marking SAS has been advised of the possibility of such damages or claims.

Gravograph is a registered trademark of GravoTech Marking SAS.

Windows is a registered trademark of Microsoft Corporation.

(c) GravoTech Marking SAS, 2011

All Rights Reserved.



**GRAVOGRAPH**



# Summary

<b>Information about regulations .....</b>	<b>4</b>
Conformity Standards.....	4
Electrical security.....	4
<b>Presentation.....</b>	<b>5</b>
Introduction .....	5
Contra-indications .....	5
Precaution in use of the touchscreen .....	6
Stages of unpacking.....	7
Unpacking - Contents of package.....	8
<b>Description.....</b>	<b>9</b>
Front view of the machine.....	9
Engraving table.....	9
Tool holder .....	10
Rear view of the machine.....	10
Left side view of the machine .....	11
Control panel of the machine.....	12
Touch Pad .....	12
Inputs/outputs .....	13
<b>Installation .....</b>	<b>14</b>
Physical installation advice .....	14
TouchPad installation and wiring .....	15
Electric installation advice .....	16
Electrical connections of the machine .....	16
Switching the machine on .....	17
Problems .....	17
Switching the machine off.....	17
Switching on again.....	17
<b>From the transfer to the engraving .....</b>	<b>18</b>
Positioning the plate onto the vice.....	18
Positioning the plate onto the optional engraving table.....	18
Adjusting the spindle.....	19
Setting of the cutter on the tool-holder .....	20
Setting-up the spindle origin.....	21
Adjusting the tool depth.....	21
Starting to engrave .....	22
<b>General maintenance .....</b>	<b>23</b>
Changing the fuses .....	23
Touchscreen cleaning .....	24
Adjusting the reference points of the machine .....	24
To adjust the M40 ABC machine with vice on the X,Y axis .....	24
To adjust the M40 ABC machine with table on the X,Y axis.....	25
To adjust the M40 ABC machine on the Z axis .....	26
<b>Technical characteristics .....</b>	<b>27</b>
Physical characteristics .....	27
Electrical characteristics.....	28
Engraving software characteristics .....	28
TouchPad kit .....	29
Optional accessories.....	29



## Information about regulations

### Conformity standards

This hardware was designed and build in conformity with the relevant EC marking and EEC directives :

- "Machine Security" Directive 2006/42/CE
- "Electromagnetic compatibility" Directive 2004/108/CE
- "Low Voltage" Directive 2006/95/CE



**The modification or transformation of this equipment, the adaptation and installation of accessories not recommended by GRAVOTECH MARKING SAS, the installation of this equipment in a manufacturing process, the piloting by a robot, the connection to an external automaton, modify the characteristics of this material and can make it not compliant with the European Directives it is subjected. These modifications voids the responsibility of the manufacturer.**

**In this case, the person who fits the machine and the equipment is responsible for the EC compliance of the final work station.**

### Electrical security

This hardware complies with standards EN 60204-1 and EN 60950-1, which also refer to the LASER system safety standard CEI 825-1 (08/2001).

The different fuses of the machine comply with the IEC 127-2 norm (International Electric Committee).

The different security levels the input/output answer are indicated for each connector in the chapter «Rear view of the machine». Two security levels are possible :

- Dangerous voltage (power supply, accessories, plugs ...).
- Very low security voltage.

### Machine security

This hardware is in conformity with the norm EN ISO12100-1 and EN ISO12100-2.

### Electromagnetic compatibility

This hardware is in conformity with electromagnetic compatibility norms:

- EN 55022 - classe B ; EN 61000-3-2 ; EN 61000-3-3 (emission in residential, commercial, and light industrial environment)
- EN 61000-6-2 (immunity in industrial environment)

All the cables used with this hardware must be in conformity with the electronic compatibility standards, norm EN 55022 - classe B.

### Electrical security

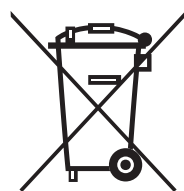


**This material is «class 1». The mains plug MUST always be connected to a neutral socket and comply with the regulations in force in the country of installation. If you do not have a plug of this type, have one installed by an approved electrician. Under no circumstances should you depart from this instruction.**

The manufacturer bears no responsibility towards any user where alterations have been carried out contrary to the manufacturer's specifications, notably with respect to electrical/electronic elements.



**Any operation, other than those mentioned here, must only be carried out by an approved Gravograph technician.  
Do not take the machine apart to repair or clean it : this will void your guarantee.**



**This symbol indicates that once this equipment has reached the end of its useful life, it must not be disposed of with non-sorted municipal waste, in accordance with the European Directive 2002/96/EC.**

**The equipment must be disposed of at an appropriate collection point for processing, sorting, and recycling of Waste Electrical and Electronic Equipment (DEEE).**

**The elements which compose Electrical and Electronic Equipment may contain substances which have harmful effects on the environment or on human health.**

**By following these instructions, you are helping the environment, contributing to the preservation of our natural resources, and protecting human health.**



## Presentation

### Introduction

Thank you for purchasing the **M40 ABC** machine and for your confidence in our knowledge in the field of the engraving. Thanks to its innovative design and with its performance results, the **M40 ABC** machine combines flexibility and full featured performance without sacrificing simplicity, ease of use, or ease of maintenance.



To begin with, we highly recommend that this entire manual be read before attempting to use the M40 ABC machine. The manual includes important information about safety, assembly, use, and maintenance of the M40 ABC machine.



The machine must never be handled without an adult present. Keep the machine, wires and cables out of children's reach.  
The M40 ABC engraving machine is a high performance machine :  
All dispositions contributing to the safety of use must imperatively be respected.

### Contre-indications d'emploi



This machine is only designed for flat work and must never be used for other applications.  
To use this machine, you are advised to wear protectives glasses against the chip ejections.  
Never use this machine for sawing or drilling.  
Do not use this machine for working with wood.  
Do not use this machine in explosive environment.



This machine is only designed for one user. Do not let several people use the machine simultaneously.



To avoid any risks of being crushed by the machine during engraving, do not stand near the tools (the travel area of the tool is 12" x 8" <sup>1</sup>/<sub>4</sub> - 305 x 210 mm).  
Do not lean over the spindle holder.



This sign shown on the tool-holder of the machine shows the danger caused by the rotating spindle during engraving (risks of getting burnt or cut).



To avoid any risks of getting burnt, the protective housing of the tool-holder must be always closed, except when carrying out adjustments.

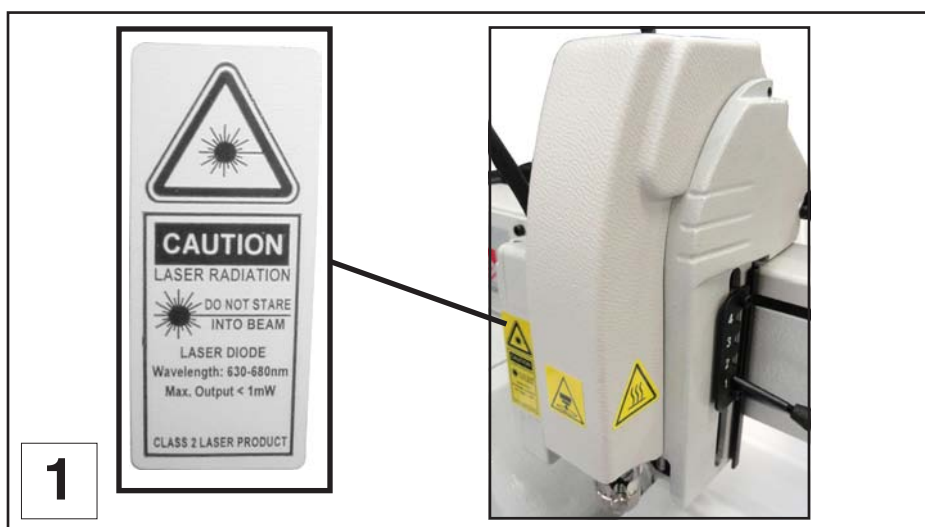


#### CAUTION - LASER RADIATION (pict. 1)

Do not stare into beam.

Laser diode - Wavelength: 630-680nm - Max. Output < 1mW

CLASS 2 LASER PRODUCT





- If the machine is not to be used for a long period, unplug the electricity supply and cover the machine (packaging, cover, lid...)
- Do not move the engraving head by hand unless mechanical block of the machine as described in the paragraph "Mechanical block" of this manual's "Installing" chapter.
- Do not spill any liquids onto the machine (drinks, cleaning fluids...) unless when recommended by GRAVOTECH MARKING SAS (example : lubrication).
- The machine should never be used with anything other than Gravograph accessories and tools.
- Never hold the material to be engraved in your hands. Only use the Gravograph clamping systems designed for your machine.
- Make sure that the material is well clamped before starting to engrave.
- During engraving, do not use this machine without a nose (depth regulating nose or vacuum nose) in order to avoid projections of swarf.
- Do not take the engraving material out of the machine during engraving.
- If the engraving must be stopped, use the function key provided for this purpose on the control panel of the machine.

#### **Precaution in use of the touchscreen**



**To clean the surface of the touchscreen, wipe it gently with soft cloth dampened by alcohol. Do not expose it to organic solvent. Do not contact or scratch the surface of the touchscreen with hard materials such as metal or glass or with one's nail.**



**Keep the touchscreen away from direct sunlight, also avoid them in high-temperature and high humidity environment for a long period.**



**Liquid in the touchscreen is hazardous substance. In case a contact with liquid crystal material is occurred, be sure to immediately wash such material away by soap and water.**



## Stages of unpacking



**Two people are necessary to unpack the M40 ABC machine.**



**Before opening the cardboard box, check that it is the right way up.**

### **1. Open the box.**

### **2. Take out the box of accessories.**

### **3. Take out the machine :**

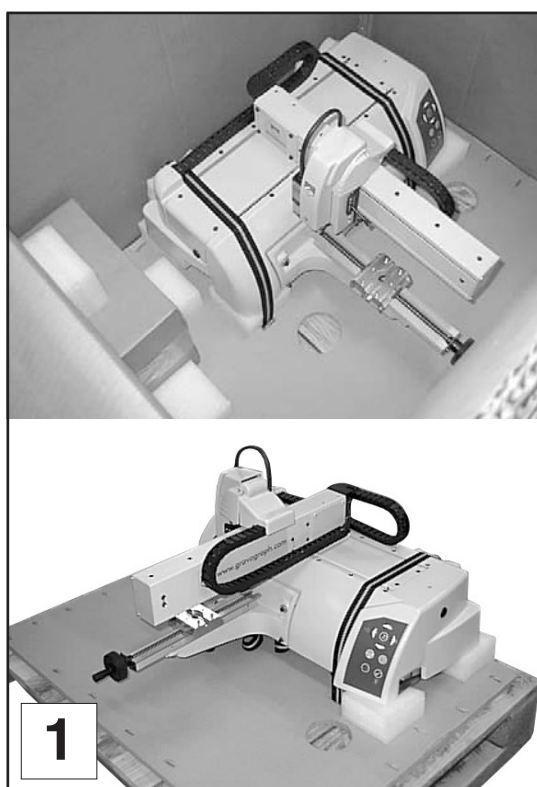
- There should be one person on each side of the machine.
- Both should lift the machine simultaneously, and place it on the working surface.



**Make sure that no components are missing from the packaging. If any part has been forgotten please get in touch with your GRAVOGRAPH dealer.**



**Keep all the packaging materials so that you can move your machine in total safety. This packing was conceived to guarantee the protection of the machine during its transport (for a return in repair for example).  
This packaging is in conformity with European recycling standards.**







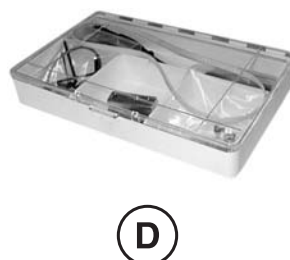
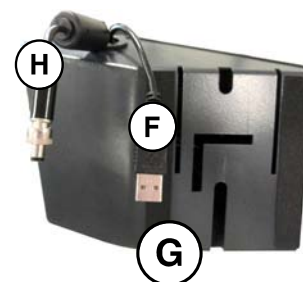
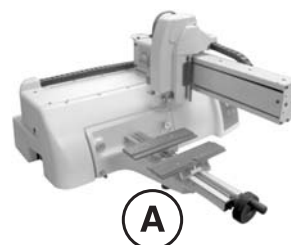
## Unpacking - Contents of package



**Check the condition of the packaging when you receive it. If there are any signs of damage, inform the carrier and your GRAVOGRAPH dealer immediately by recorded delivery, specifying the exact nature of the problem.**

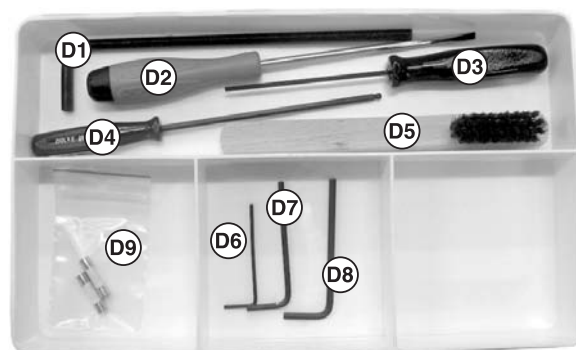
### Content of package

- A. One M40 ABC engraving machine
- B. One Touch Pad (PC with touchscreen) with stylus
- G. One Touch Pad support with :
  - (F) One USB cable
  - (H) One mains cable
- K. One standard keyboard
- C. User instructions (on CD)
- D. One toolbox
- E. One mains cable



### Contents of the toolbox

- D1. One wrench (5 - L 160)
- D2. One screwdriver (ø3,5mm)
- D3. One short allen key (2)
- D4. One round allen key (3 - L 88)
- D5. One brush
- D6. One wrench (1,5)
- D7. One wrench (2,5)
- D8. One wrench (3,0)
- D9. Two **T 2 A H - 250V \*** fuses



**T 2 A H - 250V \* = These fuses are temporized, with a high breaking capacity and comply with the IEC 127-2 norm.**





## Description

**M40 ABC** is a stand-alone machine dedicated to jewellery boutiques.

It has a Touch Pad (PC with colour touch-screen (5,7")) and a standard keyboard for preparing and controlling your engraving using an easy-to-use and intuitive engraving software installed in the Touch Pad.

The actual engraving process is controlled by the spindle.

**The M40 ABC is a machine for flat work :**

- It is supplied with a vice.
- An engraving table is in option.

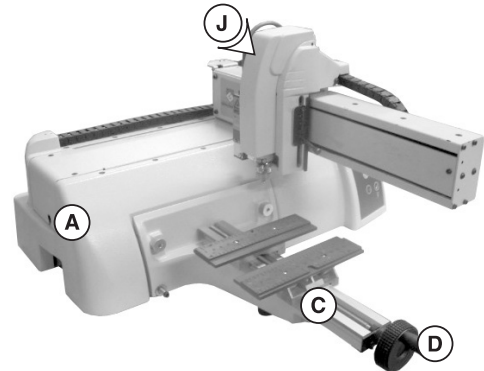


The M40 ABC machine covers a maximum engraving surface area of 12"x 8"<sup>1/4</sup>.

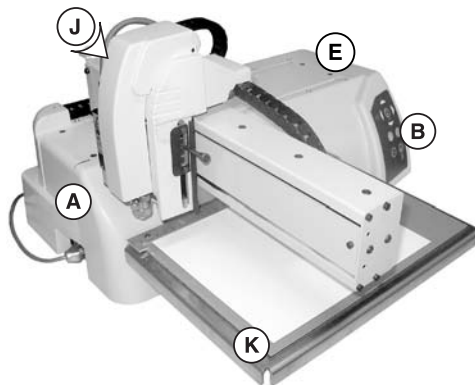
## Front view of the machine

### Engraving table

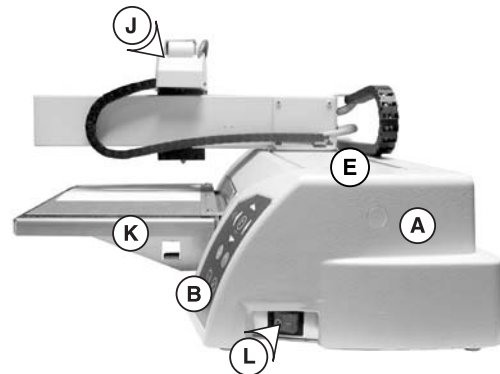
- A. Standard base
- B. Control panel (flexible 9-key control keyboard)
- C. Vice (in standard)
- D. Open-close tightening knob of the jigs
- E. Touch Pad location
- K. Engraving table (in option)
- L. General shutdown button used as an immediate stop
- J. Tool holder



**M40  
with the standard vice**

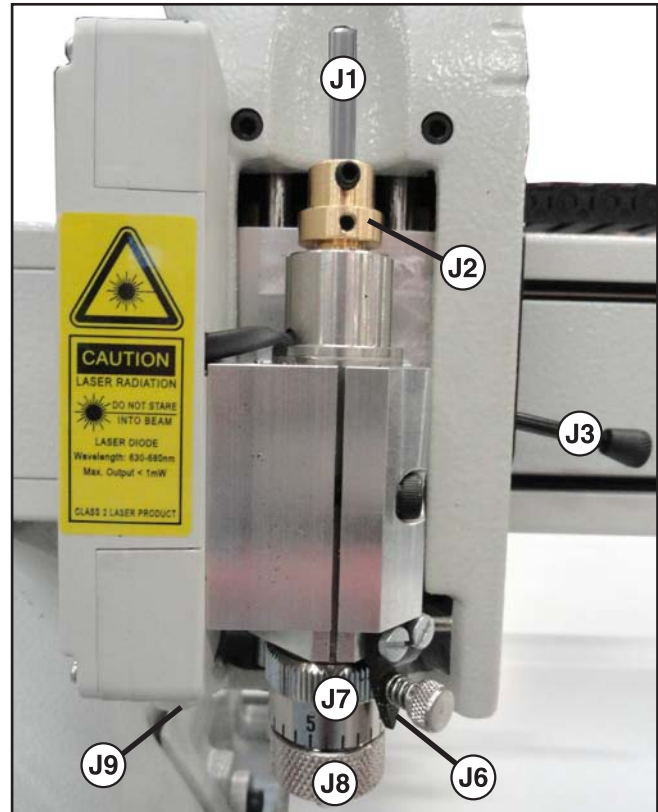
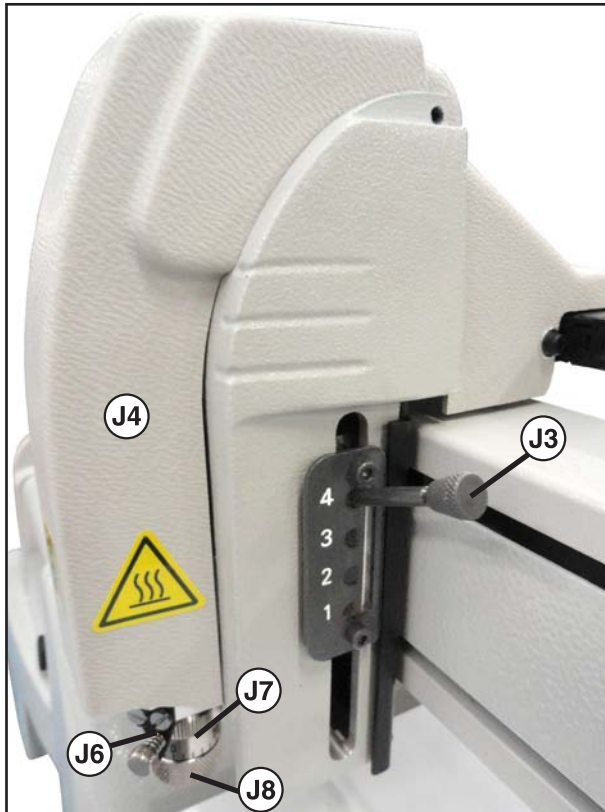


**M40  
with the optional engraving table**





## Tool holder



- J1. Cutter
- J2. Cutter button
- J3. Pressure knurl on spindle (four positions)
- J4. Housing

- J6. Index finger
- J7. Scaled knob
- J8. Nose nut
- J9. LASER diode



### CAUTION - LASER RADIATION

Do not stare into beam.

**LASER diode - Wavelength: 630-680nm - Max. Output <1mW**

**CLASS 2 LASER PRODUCT.**



## Rear view of the machine



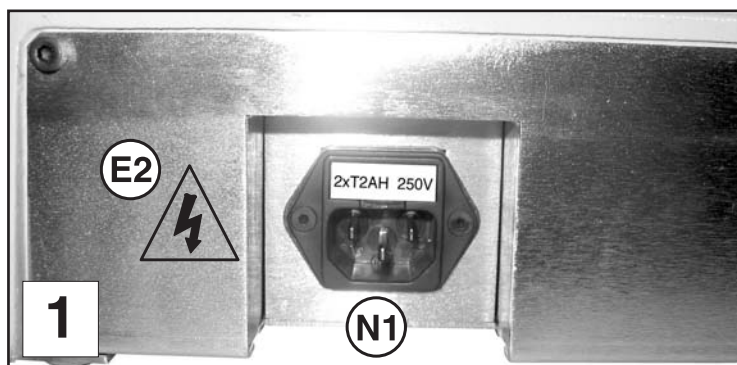
Each connection responds to one of the following security levels :

- Dangerous voltage.
- Very low security level.

N1 - Power connection with a rack for **2 T 2 A H - 250V \* fuses** - **Voltage level : hazardous voltage**



**T 2 A H - 250V \*** = These fuses are temporized, with a high breaking capacity and comply with the IEC 127-2 norm.



To avoid any risk of electrical shock, always disconnect the power cord before removing the electronics box (see label **E2**).

## Left side view of the machine

- N2 - USB port - **very low safety voltage**
- N3 - Power supply connection (Touch Pad supply) - **very low safety voltage**
- N4 - Standard Inputs /Outputs - **Very low security level**

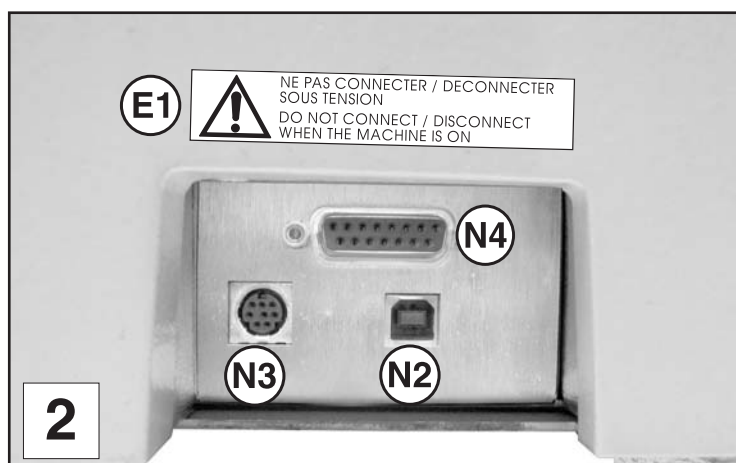


The machine must always be switched off before connecting or disconnecting a cable as indicated on label **E1** displayed on the side of the machine :

**E1**



NE PAS CONNECTER / DECONNECTER  
SOUS TENSION  
DO NOT CONNECT / DISCONNECT  
WHEN THE MACHINE IS ON





## Control panel of the machine



START (engraving start)



PAUSE



JOYSTICK



VALIDATION




MANUAL Z REF



SHIFT



If the LED is lit, the  key is activated



If the LED is lit, the machine is switched on



SPINDLE MOTOR



AUTO Z REF



RED, LASER POINTER



X,Y MACHINE SETTING



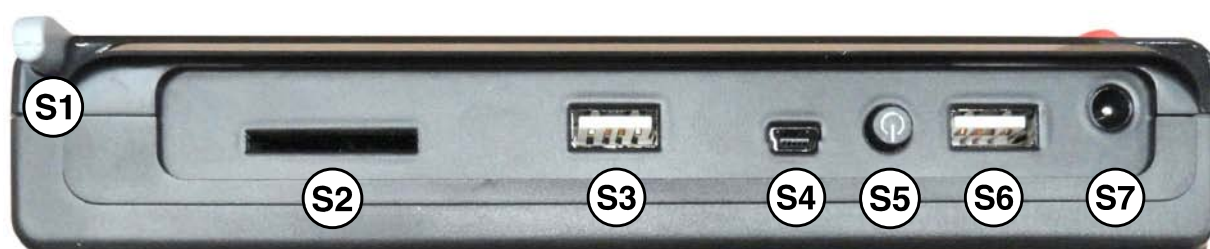
Z MACHINE SETTING



ENGRAVING CYCLE



## Touch Pad



(S1) = Stylus

(S2) = SD card slot

(S3) = USB slot - USB key

(S4) = Connector

(S5) = On/Off switch

(S6) = USB slot - Connection with the machine

(S7) = Power supply



## Inputs /Outputs



**Before making any "inputs/outputs" connections you must check that the electric and electronic features of the different inputs and outputs are respected (chart 1 and 2). A bad connection can irreparably damage the electronics of your machine.**



**The use of the function "inputs/outputs" means that the engraving machine cannot be considered individually to ensure the safety of the operator. The engraving machine is actually integrated into a global process (the automated production line).**

**Consequently, it is the final workstation (engraving machine + chip removal + miscellaneous) that must comply with the regulations in terms of safety.**

**The person who fits the engraving machine within the manufacturing process is therefore responsible for the EC compliance of the final work station.**

Access to the menu for activation of the "inputs/outputs" function is through the engraving software installed on your PC. At the moment, four inputs (I1 to I4) and four outputs (O1 to O4) are defined as described below:

### Inputs

0 . No wished input

I1 = 1 . Start

I2 = 2 . Pause

I3 = 3 . Return to origin (0,0)

I4 = 1 . Start

### Outputs

0 . No wished output

O1 = 1 . Chip removal (for GravoTech M20)

O2 = 2 . Pause

O3 = 3 . Origin (0,0)

O4 = 4 . Z position

1

	Voltage and current	Active state	Min. length of signal (active state)
<b>Input</b>	TTL compatible	Low	200 milliseconds
<b>Output</b>	Open collector		

**Input and output signals characteristics**

2

Number	Name	Direction	Designation
1	O1	output	output n°1
2	O2	output	output n°2
3	O3	output	output n°3
4	O4	output	output n°4
5	5V		5V supply
6	I 1	input	floating contact n°1
7	I 3	input	floating contact n°3
8	0V		ground
9	-		not available
10	-		not available
11	0V		ground
12	0V		ground
13	0V		ground
14	I 2	input	floating contact n°2
15	I 4	input	floating contact n°4

**Description of 15-point Sub\_socket**



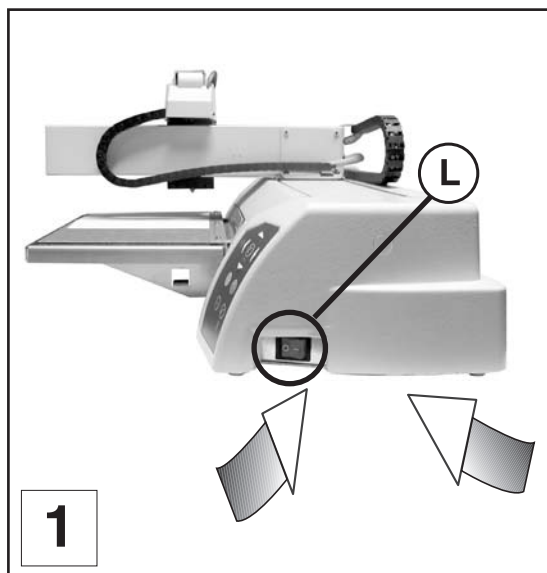
## Installing



Before carrying out the following operations, make sure the machine is switched off and unplugged, switch (L) to position 0 (pict. 1).

### Physical installation advice

- Put the Gravograph machine onto a stable flat, clean surface with mini. sizes of **17"<sup>23/32</sup> x 11"<sup>13/16</sup> (450 x 300 mm)**. Make sure the machine is well-ventilated (**pict. 1**). Do not prevent the air circulation under the machine.



- Normal lighting is sufficient to use the machine.
- Clear the work surface so that you can
  - easily and quickly access all external parts of the machine,
  - quickly gain access, in case of necessity, the general shutdown button (**L**) of the machine,
  - make sure that all moving parts of the machine have enough room to move freely,
  - avoid any accidental unplugging of the cables.



The machine's power supply cable being used as a sectioning device, it must be easily accessible and the wall plug must be installed near the machine and must also be easily accessible.



The connectors screws must be very tight to avoid accidental disconnection of the cables while the machine is turned on as this could permanently damage the electronic cards (label **E1**).

**E1**



NE PAS CONNECTER / DECONNECTER  
SOUS TENSION  
DO NOT CONNECT / DISCONNECT  
WHEN THE MACHINE IS ON

- Protect Gravograph equipment against :
  - Moisture (rain, snow, condensation...),
  - Heat (direct sunlight, heating...),
  - Brusque temperature changes,
  - Dust (exhaust pipe),
  - Liquid splashes, spillages on the electronic rack, cables and connections, and any other part of the machine; unless recommended by GRAVOTECH MARKING SAS (ex. : lubrication),
  - Vibrations,
  - Electric or electronic radiation.

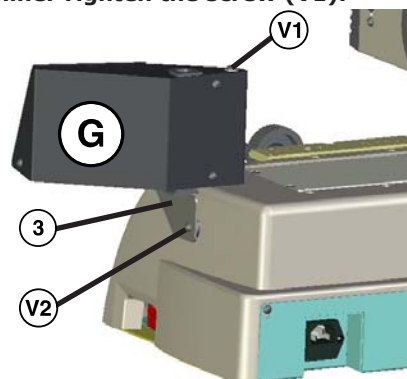
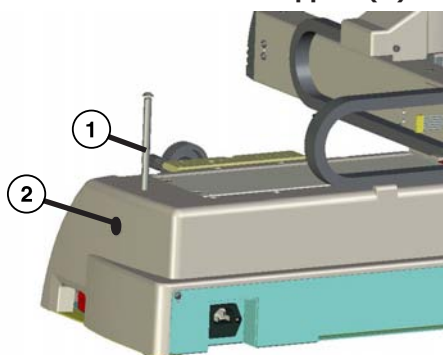




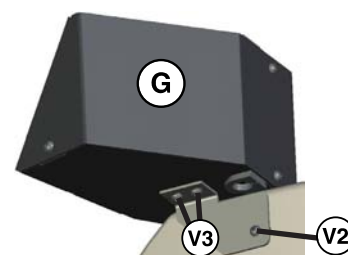
## TouchPad installation and wiring

### Installation of the TouchPad support

1. Make sure the machine is switched off and unplugged, switch (L) to position 0.
2. Place the TouchPad support (G) on the pin (1) mounted on the machine. Tighten the screw (V1).



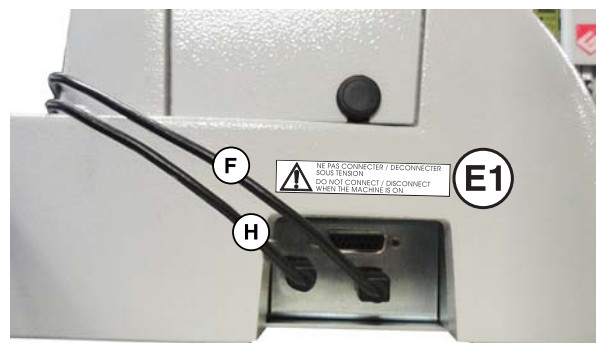
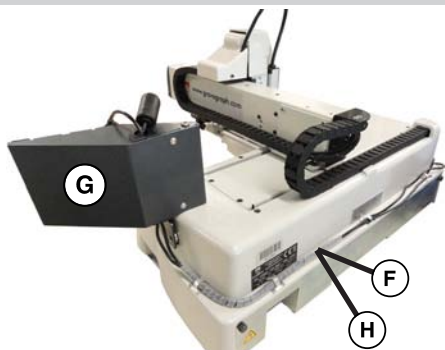
3. Remove the cap (2) and place the fixing (3) with the screw (V2).
4. Adjust the positioning of the TouchPad support (G) with the screws (V3).



5. Place the cables (F) (USB connection with the machine) and (H) (TouchPad power supply) along the back of the machine and connect them to the machine.

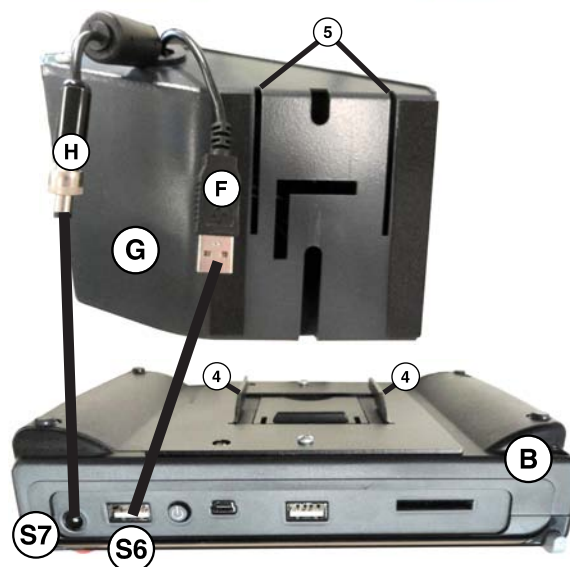


The machine must always be switched off before connecting or disconnecting a cable as indicated on label (E1) displayed on the back of the machine :



### TouchPad wiring

6. Place the TouchPad (B) on the support (G) by sliding hooks (4) in grooves (5).
7. Connect the cables (F) (USB connection to the machine (S6)) and (H) (TouchPad power supply (S7)) to the touchPad (B).





## Electric installation advice



**This material is «class 1». The mains plug MUST always be connected to a neutral socket and comply with the regulations in force in the country of installation. If you do not have a plug of this type, have one installed by an approved electrician. Under no circumstances should you depart from this instruction.**

In order to avoid outside interference, the user is advised to carry out the following points.

- Plug the Gravograph machine into a mains line, avoiding having several machines on the same line (several plugs on the same line or using a multi-plug).

**Exception :** If other things are connected to the machine (such as a machine and the computer which pilots it), the machines should be connected to the same mains line.

- Avoid using the same line to supply inductive or capacitive machines as well as the Gravograph machine (motors, electrosuicides, chargers...)
- Avoid using a manual or automatic commutator on the same mains line as the Gravograph machine (relay, temporiser, programmer, automatic circuit interrupter, automatic interrupter...).
- Check that machines surrounding your Gravograph machine are in conformity to the norms of radioelectric perturbation emissions (consult the technical leaflet of each machine). If they are not in conformity, place them as far away as possible from the Gravograph machine.
- Only use Gravograph accessories.



The machine must always be switched off before connecting or disconnecting a cable (label **E1**).

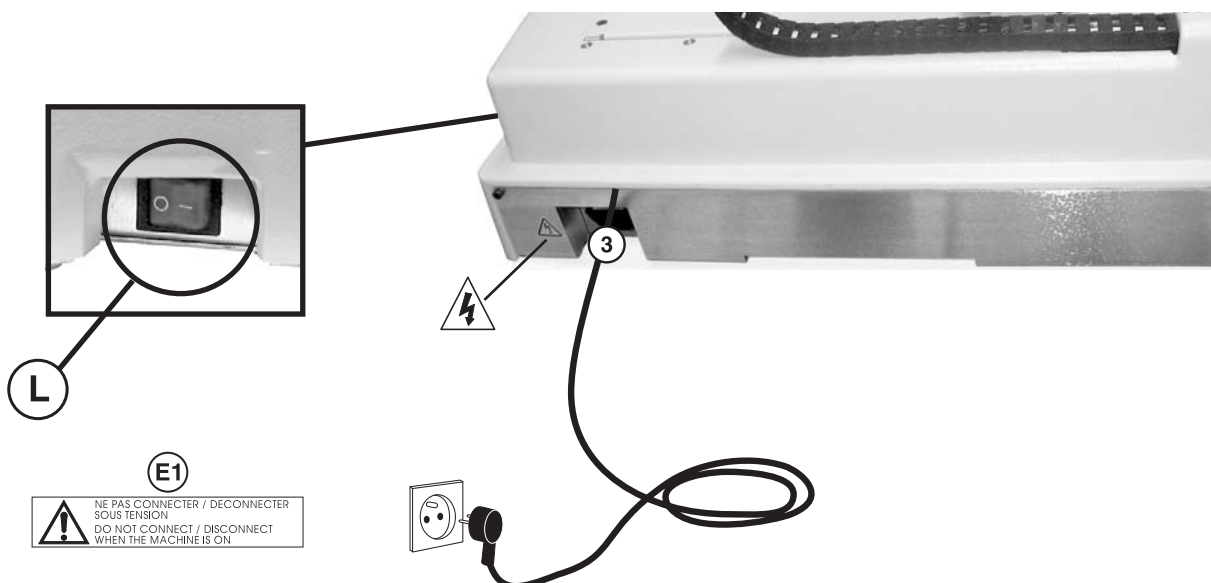
## Electrical connections of the machine

Position yourself behind the machine.

**1. Plug power supply cord (3) into the M40 ABC machine and then into the mains socket.**



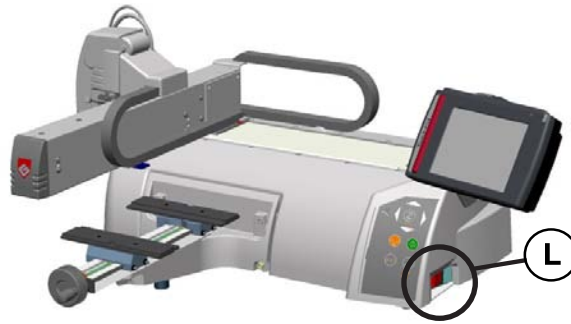
**To cut off the mains supply to your machine in the case of severe problems, unplug the mains cable (3) or switch off the machine with the main stop button (L) at the side of the machine. Make sure that you can reach them easily.**





## Switching the machine on

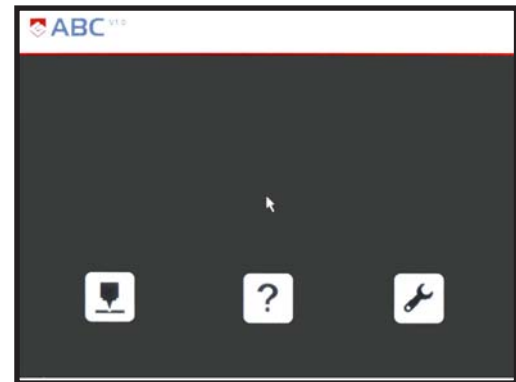
Switch on the machine main stop button (L) to position I.



After few seconds, the machine will emit a short "beep". The following screens will be displayed on the touch-screen of the machine :



### MAIN MENU



Leave the machine plugged in even if it is not in constant use.

## Problems

If one of the operational signs is absent, check the following points :

- Are the two ends of the mains cable correctly connected ?
- Is the mains plug connected ? Is it live ?



If the machine does not come on, before calling a technician, please check power connections to the mains socket and also the fuses (see "Changing the fuses").

## Switching the machine off

Switch the main stop button (L) to position O.

Switch off the machine for the following reasons :

- if you are leaving the workstation (end of the day, for example),
- physical damage (fall, fire, liquids coming into machine...),
- mechanical/electrical/electronic faults, leading to a possible breakdown,
- in case of major problem or mechanical block of the machine,
- to reboot,
- for external cleaning.

## Switching on again

If the machine or the programme which runs it crashes you may have to reboot the machine.

If this happens, switch the machine off. Wait 30 seconds and switch it on again.



Respect this rule. This time allows any electric shock to the machine, possibly damaging the power supply, to be avoided.



## From the transfer to the engraving

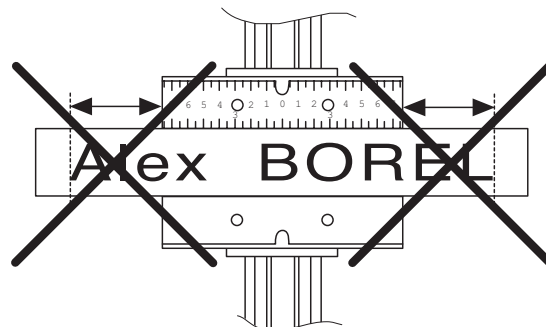
You have just created a composition with your M40 ABC engraving software.

1. From the M40 ABC program, transfer the composition to the M40 ABC engraving table.

### Positioning the plate onto the vice

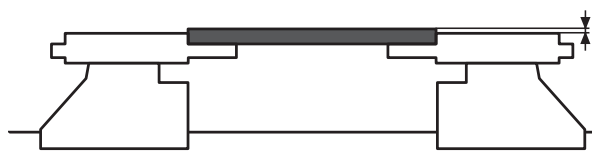
2. Choose the jigs according to the length of the plate (consult your GRAVOGRAPH dealer for more information on the various jigs available).

The length of the plate should not exceed the length of the jigs:



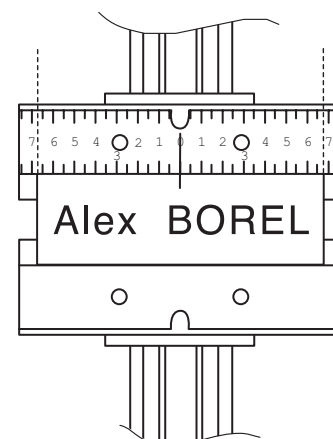
3. Choose adequate side of the jigs according to the thickness of the plate.

The plate should be slightly higher than the jigs to avoid that the regulating nose touches the jigs:



4. Mark the middle of the plate (not necessary if you use the "Point of shoot" function).
5. Centre the plate so that the centre mark is lined up with the 0 on the jig (origin centre).
6. Using the tightening knob, tighten the plate so that it cannot move during engraving.

If the plate is correctly tightened, noise and vibrations are reduced to a minimum when the machine is engraving.

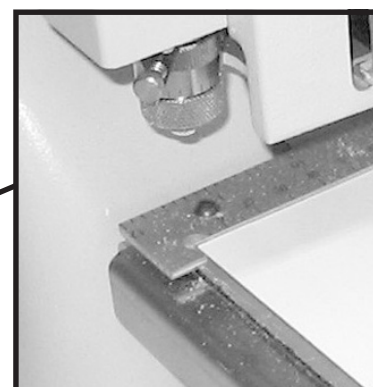
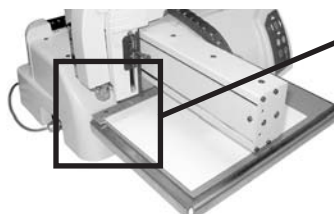


Check that the object is tightened correctly to ensure that it is not ejected during engraving.

### Positioning the plate onto the optional engraving table

2. Place the plate in the top left-hand corner (plate origin)


The plate should be against the graduated ruler using as end stop.



Check that the plate adheres well to the mat of the engraving table and that it cannot move so it does not pop out during engraving.



## Adjusting the spindle

7. Press the (START) key  and the (PAUSE) key  straight after.

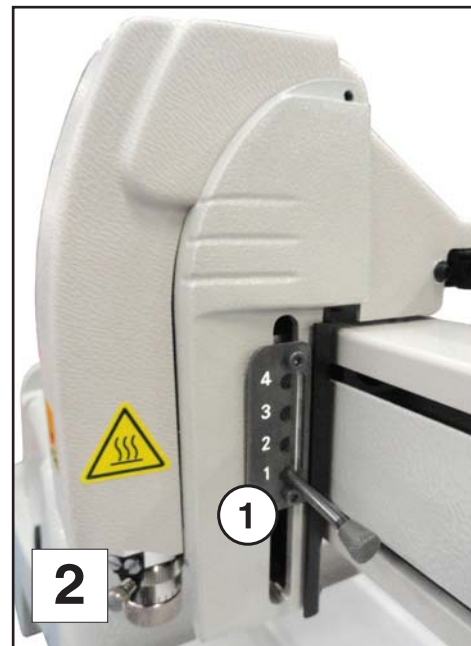
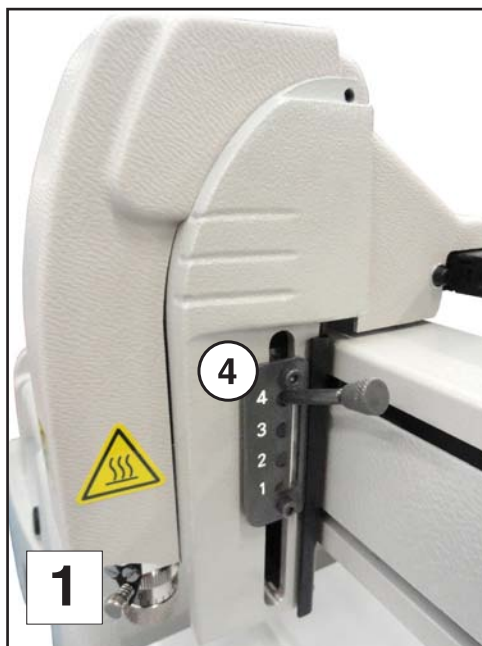
The tool holder stops above the material to be engraved exactly where the engraving should start.

8. Set the spindle pressure with the handle (High position (4) = Rigid spindle and low position (1) = Supple spindle) (pict. 1 and 2)

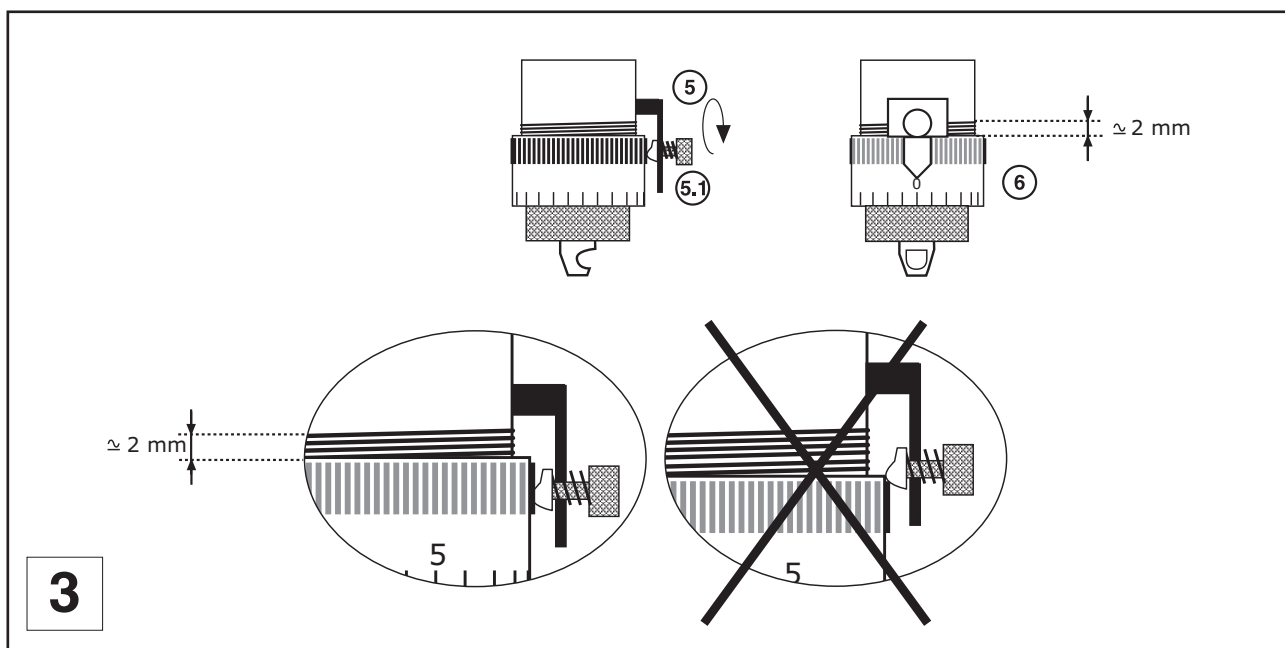
To engrave without a nose, the handle (2) must be in the higher position so that the spindle is rigid.

To engrave with a nose, the setting depends on the hardness of the material, on the cutter width and on the surface state of the plate selected (if the nose is likely to scratch the object, reduce the pressure).

9. Set the regulating nose in place on the spindle and tighten the nose nut.



10. Unscrew the index finger (5) then unscrew the scaled knob (5.1).  
Line up the 0 of the scaled knob with the index finger (6). The scaled knob should be unscrewed in such a way that the index finger blocks it (diagram 3).



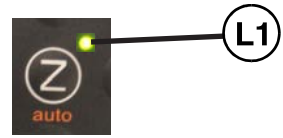


## Putting the cutter into the spindle

This plate will be engraved using a conical tool (or conical cutter) made of high speed steel with a 4.36 mm diameter and a 0.50 tip.

### 11. Press the key .

The spindle lowers until the depth regulating nose touches the material to be engraved.  
The LED (L1) is lit.



### 12. Open the housing of the tool-holder (pict. 1).



The tool is very sharp and to avoid any risks of getting cut, you are advised to use some kind of protection (gloves) to handle it.

### 13. Insert the cutter into the button until it is touching slightly (carbide cutters are not very shock resistant) the engraving material. To facilitate the insertion of the cutter, slightly unscrew the screw (3) located on the spindle knob (pict. 1).

Remember to program 0.5 to 1 mm depth to compensate possible flatness faults of the plate.

### 14. Tighten the screw (3) of the cutter button to lock it into place (pict. 1).





## Setting-up the spindle origin

### 15. Save the position of the spindle by pressing (VALID) key

The spindle moves up.  
The LED (L1) is off.



## Adjusting the tool depth

### 16. Turn the index finger a few notches to the right to obtain the desired engraving depth (one notch = 0.025 mm) (diagram 1).

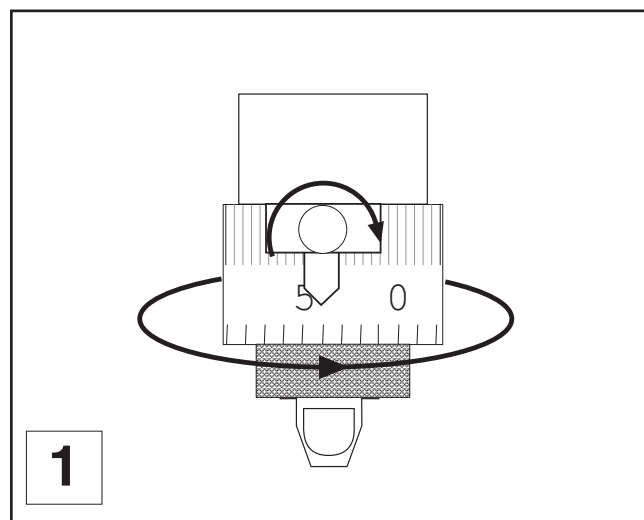
Refer to the table 2 for the number of marks to move the index finger depending on the desired depth and the material used.

### 17. Tighten the index finger in order to maintain the scaled knob in this position.

### 18. Close the housing of the tool-holder.



To avoid any risks of getting burnt, the protective housing of the tool-holder must be always closed, except when carrying out adjustments.



Engraving material	Type of cutter	Engraving depth in mm	Number of marks
Anodisal	Carbide	0,1	4
Silver	Carbide	0,3	12
Chrome	Diamond	0,025	1
Gravometal	Carbide	0,1	4
Gravoply II	Carbide	0,1	4
Stainless Steel	Diamond	0,2	8
Brass	Carbide	0,2	8
Metallex	Carbide	0,1	4
Gold	Carbide	0,3	12
Plastic	Carbide	0,2	8



## Launching the engraving



This sign shown on the spindle of the machine shows the danger caused by the rotating spindle during engraving (risks of getting burnt or cut).



To avoid any risks of getting burnt, the housing of the tool-holder must be always closed except for when adjusting the tool-holder.

For your own personal safety and to avoid any risks of being crushed by the machine during engraving, do not stand near the tools or lean over the spindle holder (the travel area of the tool is 12" x 8"<sup>1/4</sup> - 305 x 210mm).

Always wear protective glasses againsts chip ejection.



Before launching the engraving, make sure that:

- the object to be engraved is properly fastened.
- the movement zone for the chuck and the diamond tip are totally free of any obstructions.
- no one is in the movement zone for the machine's movable parts.
- no object poses an obstacle to the movable parts' movements.



Start the engraving from the M40 ABC machine control panel.

### 19. Press the START Key (Engraving Start)

The tool holder will move to the first point in the engraving and will begin engraving.



In the event of a problem, press the PAUSE key



The machine will momentarily pause.



To continue with the rest of the engraving, press the START key



To stop engraving completely, press one of the arrows on the joystick (arrow keys).

To increase the travel speed of the spindle during engraving, press the arrow key



To reduce the travel speed of the spindle during engraving, press the arrow key







## General maintenance



Before carrying out any maintenance, unplug the mains supply cable (label **E2**).

No internal part of the Gravograph machine requires user intervention : general maintenance is limited to external cleaning. If necessary, the user can change the fuses.

If you wish to have the inside of your machine cleaned, contact a Gravograph technician.



**The mains cable should always be replaced if it is damaged in any way : flattened, nicked, cracked etc..., or if there are bare wires.**

## Changing the fuses

You will find the spare fuses in the accessories bag for the machine.  
The machine comes with 2 **T 2 A H - 250V \*** fuses.



**T 2 A H - 250V \* = These fuses must be temporized, with a high breaking capacity and must comply with the IEC 127-2 norm.**



Unplug your machine cable from the mains (label **E2**).

1. Disconnect the mains cable from the socket at the back of the machine to give easier access.
2. Pull out the drawer containing the fuses (pict. 1).
3. Replace the fuse(s) and close the drawer again.



If the new fuse blows, contact an approved GRAVOGRAPH technician.



1



## Touchscreen cleaning



To clean the surface of the touchscreen, wipe it gently with soft cloth dampened by alcohol. Do not expose it to organic solvent.

## Adjusting the reference points of the machine

After it has been used for some while the reference points of the machine can alter slightly (these points are slightly out of line with the clamping system, the Z position at the mechanical stop is above or below its normal position).

The **M40 ABC** machine has a very simple adjustment system which can be carried out by an expert user (which enables the machine to be adjusted without having to return it to the distributor).

If you notice that it is out of line in relation to your engraving measurements, adjust the machine.

### To adjust the M40 ABC machine with vice on the X,Y axis



To adjust this reference point in XY you need to use 2 centring washers (D11) and (D12) (undelivered with the machine) positioned as indicated on photos.

1. Power up the machine and wait a few moments.

2. Press the   keys simultaneously.



The tool-holder moves towards the top left-hand corner



3. Press the  key until it shortly beeps.


The tool-holder moves towards the zero point of the LASER diode.

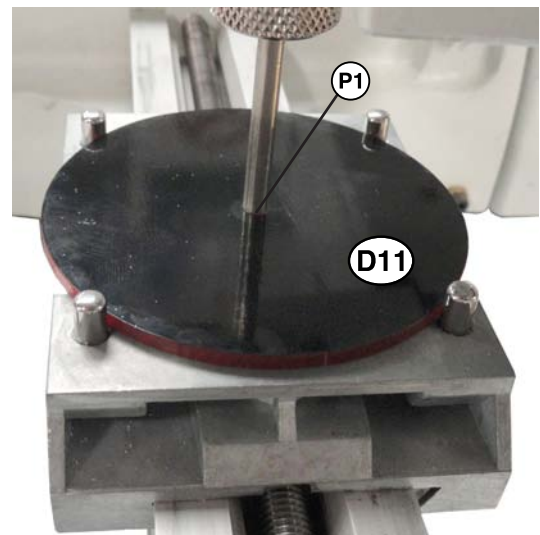
4. Press the  key until it shortly beeps.

The tool-holder moves towards the centre of the vice to begin the reference point adjustment: The cutter must be able to slide in the hole of the reference point (P1) of the centring washer (D11).



5. Set the zero point (0,0,0) on the machine's Y axis using the 2 keys  and .



6. Set the zero point (0,0,0) on the machine's X axis using the 2 keys  and .


7. Save the position of the zero point O(0,0) on the X and Y axes by pressing the  key until it shortly beeps.

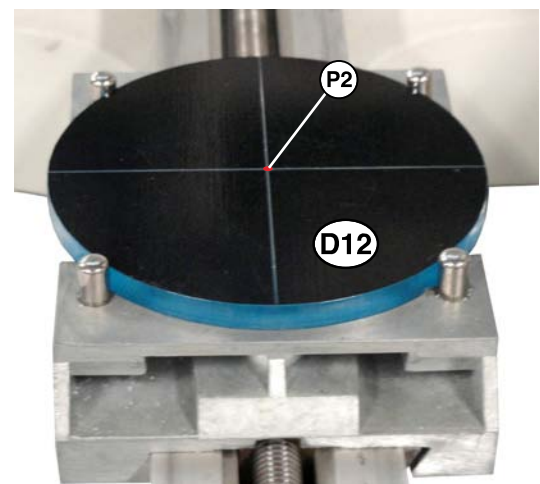


The tool-holder moves towards the zero point of the LASER diode to begin the reference point adjustment: The red pointer must be coincide with the reference point (P2) of the centring washer (D12).

8. Set the zero point of the diode D(0,0,0) on the machine's Y axis using the 2 keys  and .

9. Set the zero point of the diode D(0,0,0) on the machine's X axis using the 2 keys  and .








10. Save the position of the zero point O(0,0) on the X and Y axes by pressing the  key until it shortly beeps.

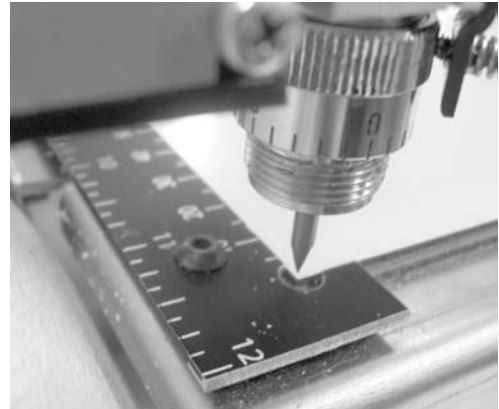









**To adjust the M40 ABC machine with table on the X,Y axis**

1. Power up the machine and wait a few moments.



2. Press the   keys simultaneously.  
The tool-holder moves towards the top left-hand corner of the table.
3. Set the zero point (0,0,0) on the machine's Y axis using the 2 keys  and .
4. Set the zero point (0,0,0) on the machine's X axis using the 2 keys  and .
5. Save the position of the zero point O(0,0,0) on the X and Y axes by pressing the  key until it shortly beeps.

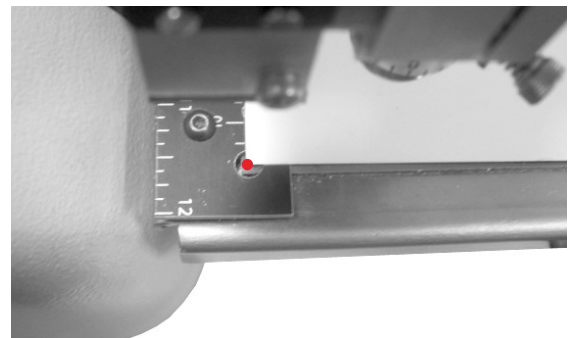


The tool-holder moves towards the zero point of the LASER diode.

6. Set the zero point of the diode D(0,0,0) on the machine's Y axis using the 2 keys  and .
7. Set the zero point of the diode D(0,0,0) on the machine's X axis using the 2 keys  and .
8. Save the position of the zero point D(0,0,0) on the X and Y axes by pressing the  key until it shortly beeps.

The tool-holder moves towards the centre of the vice.

9. Press the  key until it shortly beeps.  
The tool-holder moves towards the zero point of the LASER diode.
10. Press the  key until it shortly beeps.





**To adjust the M40 ABC machine on the Z axis**

1. Power up the machine and wait a few moments.
2. Use the spindle with a depth regulating nose, without cutter and without spindle pressure (position (1)).



3. Press the   keys simultaneously.

The tool-holder moves towards the centre of the table or the vice.

The spindle lowers until the depth regulating nose touches the plate.

4. Set the zero point (0,0,0) on the machine's Z axis using the 2 keys  and .



A paper (thickness about 0,1mm) must be able to slide between the plate and the depth regulating nose.

5. Save the position of the zero point O(0,0,0) on the Z axis by pressing the  key until it shortly beeps.



## Technical characteristics

Vers 0.0 - 12/10/2011

### Physical characteristics

	M40 ABC Machine
Overall size (w x d x h)	550 x 590 x 360 mm 21.7 x 23.2 x 14.2 in
Net weight	(Vice): 18 kg - 39.7 lb (Table): 19 kg - 41.9 lb
Package size (w x d x h)	580 x 780 x 510 mm 22.8 x 30.7 x 20.1 in
Shipping weight	Max. kg - lb

### Engraving characteristics

	M40 ABC Machine
Maximum engraving area	305 x 210 mm 12 x 8.2 in
Table surface (Table in option)	330 x 260 mm 13 x 10.2 in
Max. Flatness (Vice)	0.3 mm - 0.01 in
Z max. clearance (table - spindle)	35 mm - 1.4 in
Z max. clearance (vice - spindle)	50 mm - 2 in
Z spindle travel	40 mm - 1.57 in
Automatic Z Ref.	Yes
Max. vice opening	225 mm - 8.9 in
Max. X,Y working speed	25 mm/s - 0.98 in/s
Max. X,Y off-load speed	40 mm/s - 1.57 in/s
X,Y engraving precision	< 0,1 mm - 0.004 in
Engraving repeatability	< 0,05 mm - 0.002 in
Kind of spindle	Rotating / top loading
Cutter diameter	4,36 mm - 11/64 in
Max. rotation speed	20 000 rev/min
Speed regulation	No
Output	50 W
Depth regulating nose	Compatible with all the depth regulating noses

### Sound signal according to standard ISO 11201

		M40 ABC Machine
Waiting for engraving	LAeq - dB (A)	51 ± 1
Nominal engraving	LAeq - dB (A)	69 ± 2
Nominal engraving peak	Lp Cpeak - dB (C)	< 89



## Environment

Operational temperature	min. +5 °C ; + 41°F - max. +40°C ; + 104°F
Storage temperature	min. -5 °C ; + 23°F - max. +45 °C ; + 113°F
Degree of relative moisture when in use	20 to 80 %

## Point & shoot

	<b>M40 ABC Machine</b>
Kind	LASER diode
Wavelength	630 - 680 nm
Max. output / Class	1 mW / Class 2

## Electrical characteristics

	Electronic	Power supply (V)	Max. absorbed current (A)	Frequency (Hz)	Absorbed power (W)	Type of protection	Insulation - Type of service	Electromagnetic compatibility	
								Emission	Immunity
M40 ABC Machine	Integrated Removable easily	AC 100 - 240	1.2 - 0.55	60 - 50	125	Fuses 2x T2 AH	Classe I - S1	Norme EN 55022 classe B ----- Norm EN 61000-3-2 ----- Norm EN 61000-3-3	Norm EN 61000-6-2 (industrial environment)

## Connections - Control panel - Links

	<b>M40 ABC Machine</b>
Connection with the computer	USB
Cylinder attachment connection	mini DIN female 8 - pin
Control panel	Membrane with raised tactile points
Number of keys	9
Display	Touchscreen of the TouchPad
Inputs/Outputs connection	Sub - D female 15 - pin

## Engraving softwares characteristics

Engraving Software	ABC software
Firmware	version x.xx and more
Operating System (for the engraving software)	Windows CE 5.0
Languages	Fre, Eng



---

**Optional accessories**

	<b>TouchPad kit</b>
<b>Overall Dimensions</b>	217 x 122 x 153 mm 8.5 x 4.8 x 6.0 in
<b>Net weight</b>	
<b>TouchPad dimensions</b>	186 x 122 x 45 mm 7.3 x 4.8 x 1.8 in
<b>TouchPad weight (without supply)</b>	
<b>Control panel</b>	Touch Panel TFT 5.7" - 640x480 dots - Backlight by leds - type : resistive
<b>USB Host</b>	x 2
<b>SD card reader</b>	FAT 32 - SD HC compatible
<b>Power supply connexion</b>	Jack
<b>Keypad</b>	USB wirelessly
<b>On/Off switch</b>	Yes
<b>Battery</b>	Li-ion

---

**Optional accessories**