

# MARKER 2000

Operating manual

CE

D430498XA  
vers. 4.0

EN



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## GUIDE TO THE MANUAL

This manual has been produced to serve as a guide for users of the MARKER 2000 electronic marking machine. Read it carefully: it is essential if you wish to operate your machine safely and efficiently.

### CONSULTATION

The content of the manual are divided into sections relating to:

- Machine description .....	Chapter	1
- Transport and installation .....	Chapters	2-3
- Regulation and use .....	Chapters	4-5-6
- Tests and maintenance .....	Chapters	7-8-9

### TECHNICAL TERMS

Common technical terms are used in this manual.

To assist those with little experience of marking keys, below is an illustration of the terms used for the different parts of keys.

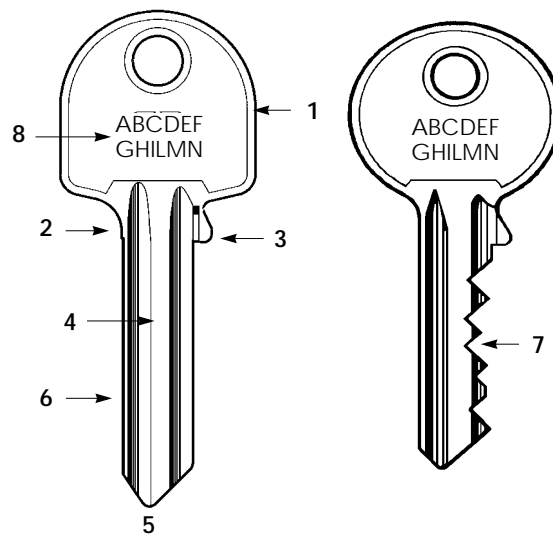


Fig. 1

- 1) Head
- 2) Rim
- 3) Stop
- 4) Stem
- 5) Tip
- 6) Back
- 7) Cuts
- 8) Marking

## GENERAL

MARKER 2000 has been designed according to the specifications of the Machine Directives. From the design stage risks for the operator have been eliminated in all areas: transport, regulation, marking and maintenance.

Other risks have been eliminated by the use of protective devices for the operator.

The material used in the manufacture of this machine and the components employed during use of the machine are not dangerous and their use complies with standards.

### USE

The electronic marker is designed for the marking of metals in general, brass, silvernickel, etc.

It must be installed and used in the way laid down by the manufacturer.

If the marker is used differently or for purposes different from those described in this manual, the customer will forego any rights he may have over SILCA S.p.A. Furthermore, unforeseen danger to the operator or any third parties may arise from incorrect use of the machine.

### INCORRECT USE

The marking of plastic materials in general, cardboard, etc. and negligence in the use of the machine or failure on the part of the operator to observe the instructions given in this manual are not covered by the guarantee and the manufacturer declines all responsibility in such cases.

It is therefore indispensable to read the operating manual carefully in order to make the best use of the marker and benefit from its potential.

### FURTHER RISKS

There are no further risks arising from the use of the MARKER 2000.

### PROTECTION AND SAFETY PRECAUTIONS FOR THE OPERATOR

The MARKER 2000 is built entirely to standards. The operations for which it has been designed are easily carried out at no risk to the operator.

The adoption of general safety precautions and observation of the instructions provided by the manufacturer in this manual eliminate all human error, unless deliberate.

The MARKER 2000 is designed with features which make it completely safe in all parts.

#### • Power supply

MARKER 2000 is supplied with electricity by means of an earthed plug and differential switch.

#### • Start-up

The machine is started up by means of the master switch on the back.

#### • Maintenance

The operations to regulate, service, repair and clean the machine have been devised in the simplest and safest way possible. There is no danger of removable parts being replaced wrongly or unsafely.

#### • Machine identification

The machine is provided with an identification label which shows the serial number (fig. 2).

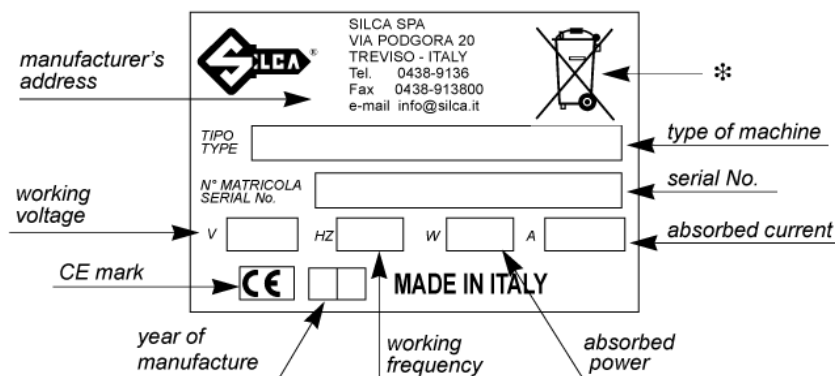


Fig. 2

(\*) see 11 "DISPOSAL", page 49.

# 1 MACHINE DESCRIPTION

MARKER 2000 is an electronic device designed for marking keys, cylinders and medals using micro-dot technology. Accurately studied, it adds a high degree of marking precision and elegance to operating speed and ease of use.

The most complete marking program is obtained by connecting MARKER 2000 to a personal computer loaded with the "MARKER 2000 PROGRAM".

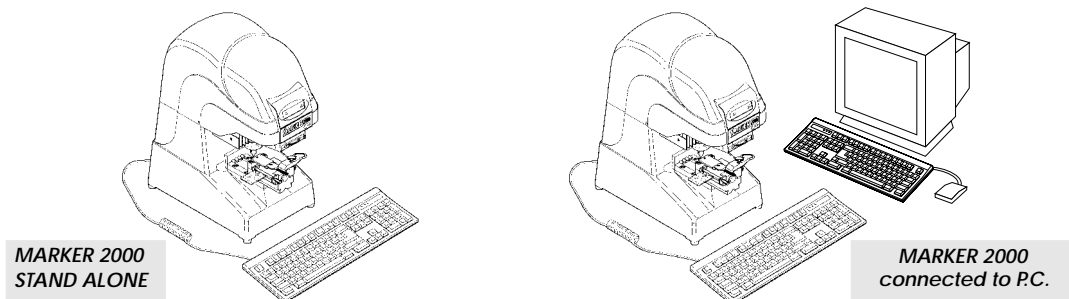


Fig. 3

The standard "C1" clamp installed on the machine is used for the cutting of flat keys.

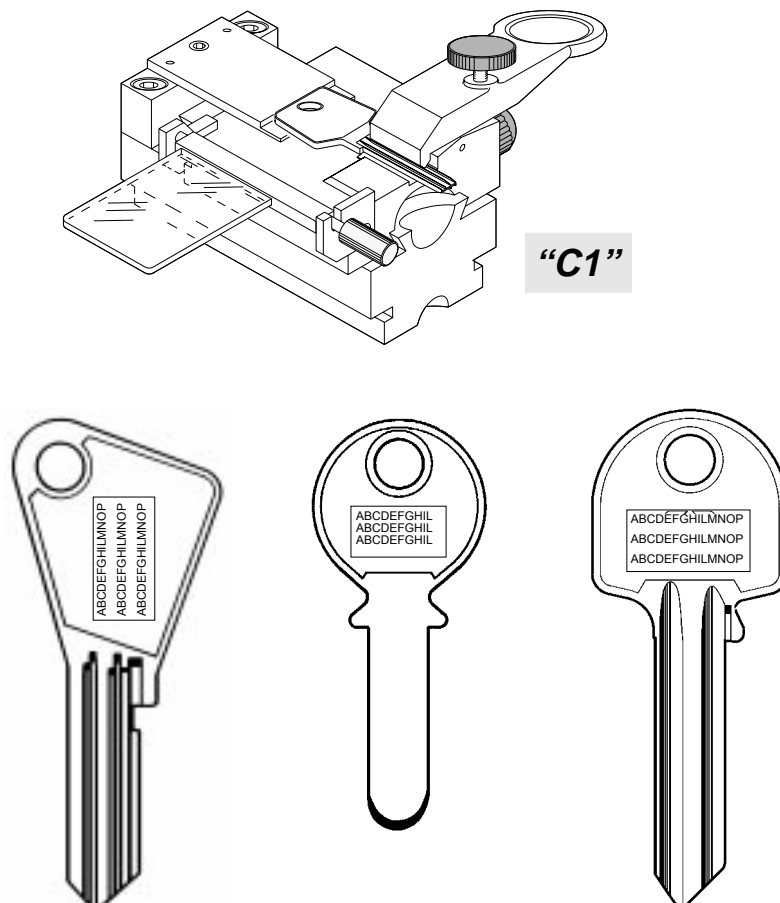


Fig. 4

## 1.1 Main Features

- **Movement**

Movement of the two axes (x-y) operates on ball couplings which ensure maximum smoothness and fluid movements, without play.

- **"C1" Clamp**

Designed to take any type of flat key, it features regulation of the key grip point so that its position is not altered. In this way flat keys of any length and thickness can be marked.

- **Marker punch**

A steel punch, simple to replace and with a maximum run on the Z axis of 4 mm.

The punch is moved by means of an electromagnet incorporated in the head of the machine and has a maximum frequency of 70/80 punches per second.

- **Punch regulation ring**

With this type of regulation the operator can quickly and easily obtain a suitable marking depth for the type of character selected and the type of material involved, thereby making full use of the machine's potential.

- **Tracking**

An electronically controlled laser system which, by means of a series of defined areas, allows rapid and precise identification of the marking zone most suitable for the operator and tracks its position.

The tracking disk installed on the machine includes eight different marking zone.

- **Marking**

Possible on all models comprised in the range of flat keys, including the creation of a customized file to memorize texts, marking zones, article numbers, etc.

Keys for centralized locking systems can be marked in mass production.

- **Display**

Alphanumeric display with scrolling text of 4 lines of 20 characters each, illuminated from behind and placed in the upper part of the machine.

The technical features and position of the display ensure excellent visibility for the operator.

- **Keyboard**

The keyboard (standard for IBM\* compatible PCs) is an essential part of the machine. It is used both for writing the texts and for controlling the machine functions through a series of special function keys.

**The keyboard is not supplied by the marking machine manufacturer as it is preferable for end-users to select the most suitable model for their needs from those available on the market (nationality, etc.).**

\*IBM is a trade mark of the International Business Machine Corporation.

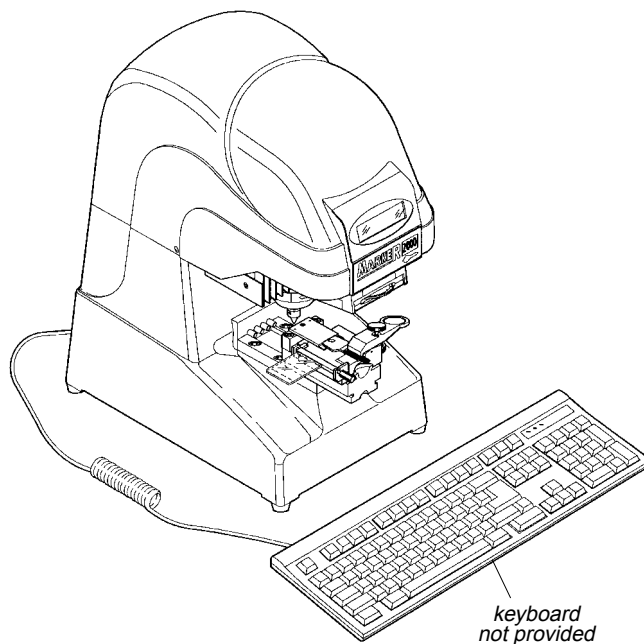


Fig. 5



## 1.2 Working parts

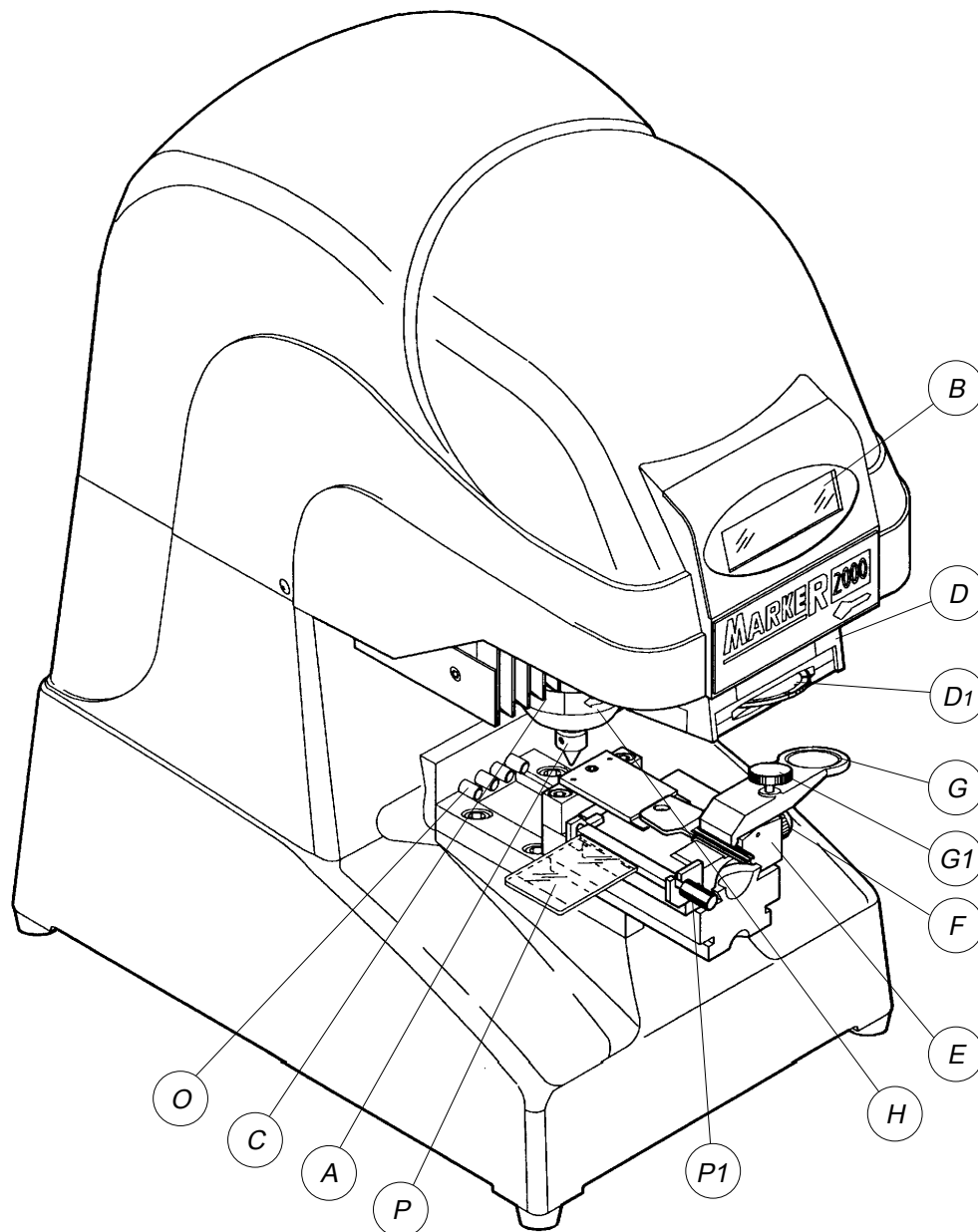
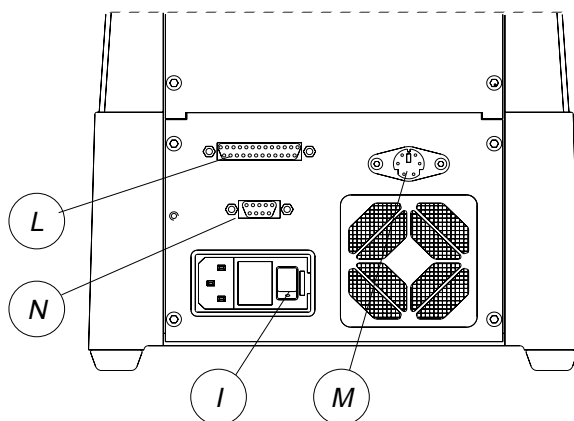


Fig. 6



- A - marking punch
- B - display
- C - marking depth regulation ring
- D - tracking device
- D1 - tracking disk
- E - clamp slide
- F - slide-locking knob
- G - key-locking jaw
- G1 - jaw-locking knob
- H - head unit
- I - master switch
- L - feeder outlet
- M - keyboard outlet
- N - serial port (PC)
- O - clamp sensor
- P - glass slide diffuser
- P1 - glass slide rotation knob

## 1.3 Technical data

**Power:**

230V-50Hz - 80 Watt 0.4 Ampere; 110V-60Hz - 90 Watt 0.6 Ampere

**Punch:**

(tempered) interchangeable, designed for marking keys.

**Max. punch frequency:**

70-80 punches per second

**Movements:**

on 2 axes by means of ball couplings

**Clamp:**

C1 (standard) designed to grip all flat keys

**MArker run:**

X axis: 50 mm Y axis: 35 mm

**Display:**

20 characters, 4 lines, illuminated from behind

**Keyboard:**

standard IBM\* compatible with mini din 6 pole socket

**Connectors:**

standard 9 pin serial port RS232; 25 pin feeder outlet; mini din 6 pole keyboard socket

**Dimensions:**

width: 220 mm depth: 320 mm height: 450 mm

**Mass:**

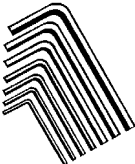
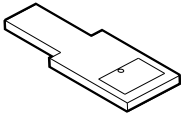
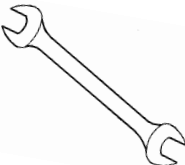
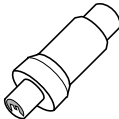
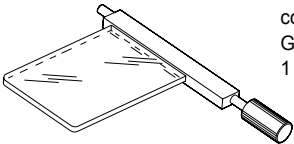




Kg. 20

**Noise in use:**

Lp (A) = 85.3 dB (A)

## 1.4 Accessories provided

MARKER 2000 comes with a set of accessories for its operation and maintenance (tools, hex. wrenches, fuses, etc.) housed in the special tool holder and comprising:

 <p>SET OF HEX WRENCHES 7 pcs.</p>		 <p>code D412279BA GAUGING TEMPLATE 1 pc.</p>	
 <p>code D309259ZZ 7 - 8 mm SPANNER 1 pc.</p>		 <p>code D312421ZZ KEYBOARD ADAPTER 1 pc.</p>	
 <p>code D112170FA GLASS SLIDE DIFFUSOR 1 pc.</p>		 <p>FUSE (2 pcs) code D309226ZZ 3.15 Ampere rapid (230V)</p>	
 <p>FUSE (2 pcs.) code D309227ZZ 1 Ampere delayed (230V)</p>	 <p>FUSE (2 pcs.) code D312423ZZ 2 Ampere delayed (230V)</p>	 <p>FUSE (2 pcs.) code D308726ZZ 4 Ampere delayed (230V)</p>	

## 2 TRANSPORT

The marking machine is easily transported and is not dangerous to handle.  
The packed machine can be carried by one person.

### 2.1 Packing

The packing for MARKER 2000 is designed to ensure safe transportation and protect the machine and all its parts.

The packing comprises two panels, (a) lower and (b) upper and two shells (c) in expanded material which enclose the machine (fig. 7).

A strong cardboard box, the dimensions of which are shown in fig. 8 and a nylon wrapper protect the machine even when it is stored for long periods.

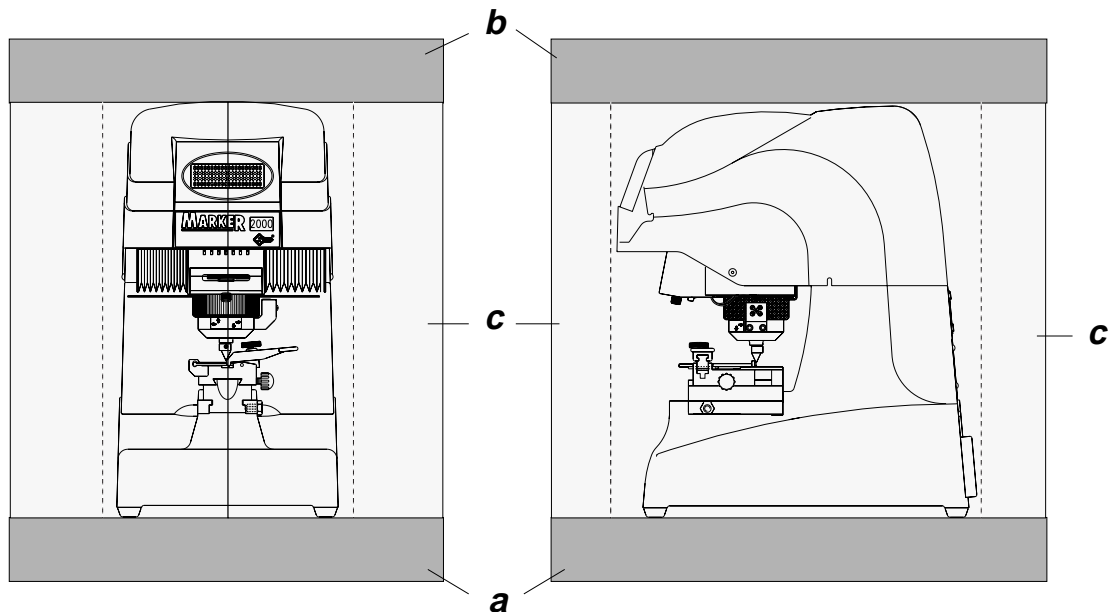


Fig. 7

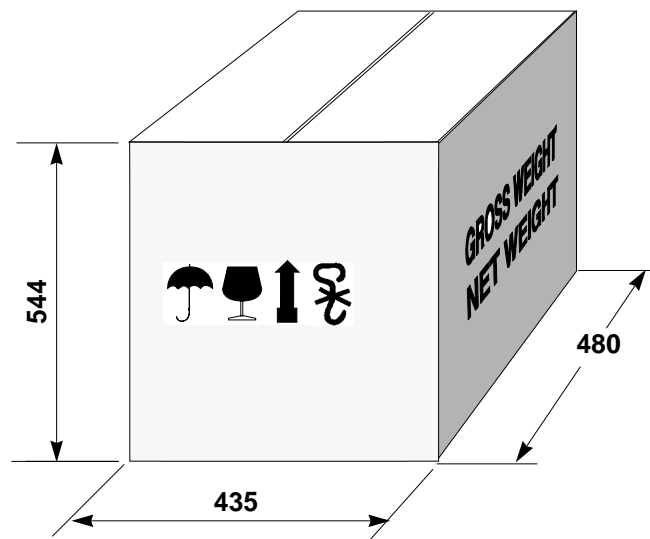


Fig. 8

## 2.2 Transport

The symbols printed on the outside of the cardboard box show the optimum conditions for both transport and storage.

It is advisable to use the packing every time the machine is transported, as this will avoid knocks causing damage.

## 2.3 Unpacking

To remove the machine from the packing box:

- 1) cut the straps with scissors and remove.
- 2) prise off the staples.
- 3) it is advisable to open the box without damaging it so that it may be used again (removals, dispatch to manufacturers for repairs or servicing).
- 4) check the contents of the box, which should comprise:
  - 1 MARKER 2000 marking machine packed in its protective shell.
  - 1 set of documents, including: operating manual, spare parts list and guarantee.
  - 1 power cable.
  - 1 tool kit.
- 5) remove the machine from the protective shell.

## 2.4 Machine handling

When the marking machine has been unpacked, place it directly on its workbench.

This operation can be carried out by one person, firmly holding the base, and no other part, to lift and carry the machine.

### 3 MACHINE INSTALLATION AND PREPARATION

The marking machine can be installed by the purchaser and does not require any special skills. The machine is supplied ready for use and does not need to be set up. However, some checks and preparation for use need to be carried out by the operator.

#### 3.1 Checking for damage

The MARKER 2000 is solid and compact and will not normally damage if transport, unpacking and installation have been carried out according to the instructions in this manual. However, it is always advisable to check that the machine has not suffered any damage.

#### 3.2 Environmental conditions

To ensure that the best use is made of the marking machine, certain parameters must be borne in mind: damp, badly ventilated sites should be avoided.

The ideal conditions for the machine are: temperature between 0 and 40°C, relative humidity approx. 60.

#### 3.3 Positioning

Place the machine on an horizontal surface, solid enough to take the weight (20 Kg.).

To facilitate operation the height of workbench should be approx. 100-120 cm.

It is important to leave sufficient space, especially behind the machine (20-30 cm) to ensure proper ventilation.

Remember to provide space for the keyboard (fig. 9).

**WARNING:** ensure that the machine voltage is the same as that of the mains, which must be properly earthed and provided with a differential switch.

Connect the power cable and keyboard.

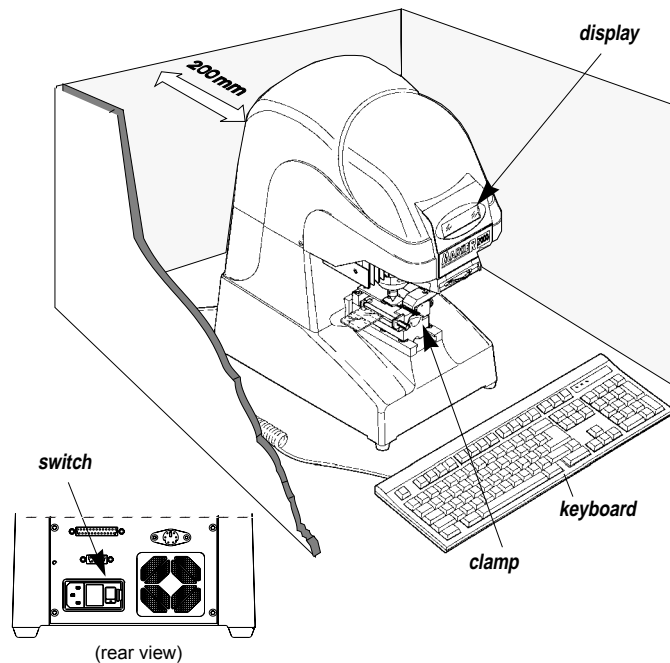


Fig. 9

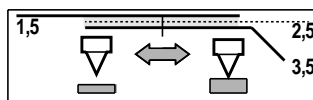
(rear view)

#### 3.4 Description of work station

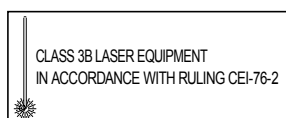
The machine needs only one operator, who has the following controls at his/her disposal (fig. 9):

- master switch placed on the back of the machine
- clamp for positioning keys to be marked
- keyboard
- display

#### 3.5 Graphics



PUNCH  
REGULATION  
PLATE



ADHESIVE  
LABEL WITH  
LASER WARNING

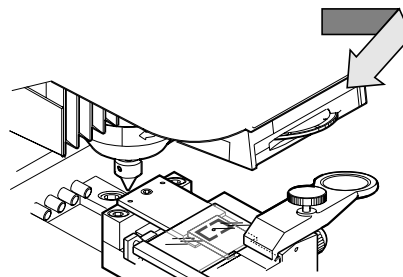


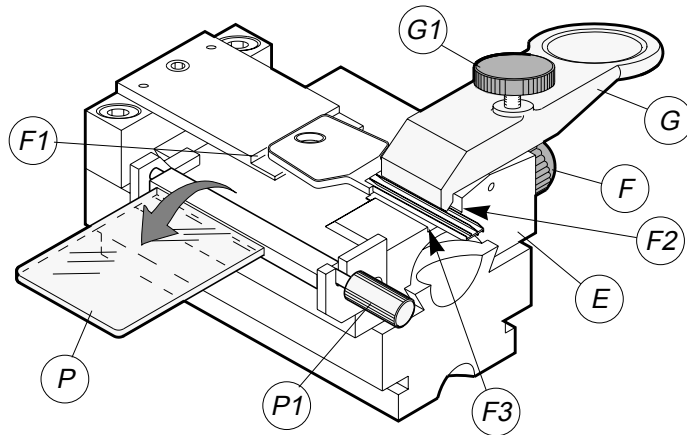
Fig. 10

**WARNING:** regulations require that warning label in the language to be used be attached to the machine as shown in fig. 10.

## 4 REGULATION AND USE OF THE MACHINE

### 4.1 Clamp

The "C1" clamp, designed for the greatest possible number of flat keys, incorporates a rapid, easy to use system for securing and regulating the keys and comprises the following parts:

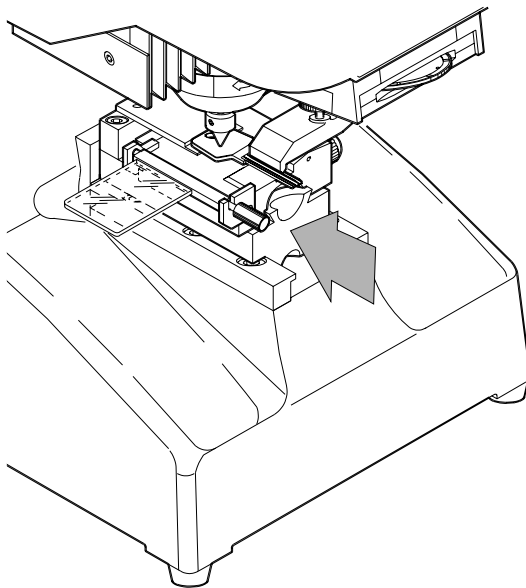


- G - key-locking jaw
- F2 - R/h back stop
- G1 - jaw-locking knob
- F3 - L/h back stop
- E - clamp slide
- P - glass slide diffuser
- F - slide-locking knob
- P1 - glass slide rotating knob
- F1 - key head stop

Fig. 11

During marking operations the clamp has two basic positions:

#### A MARKING position



#### B TRACKING position

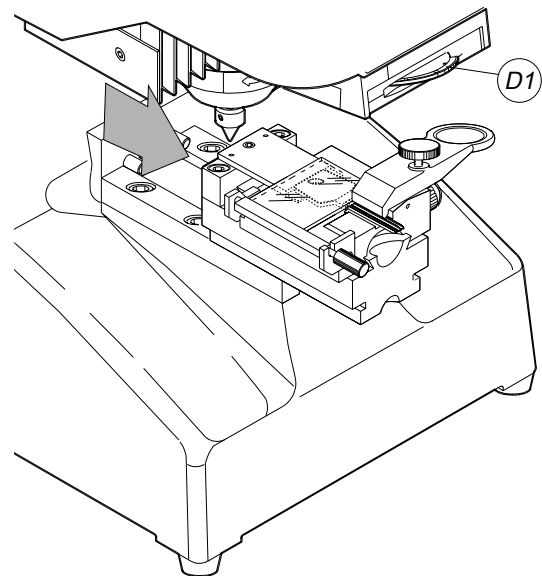


Fig. 12

- **MARKING position:**

The clamp is pushed all the way in towards the machine (fig. 12-A).

Before marking takes place, an electronic control on the machine prevents commencement of the cycle if the clamp is not properly positioned.

- **TRACKING position:**

The clamp is pulled towards the operator (fig. 12-B) until it engages with the shutter. Activation of the laser beam to identify the marking zone is electronically controlled and a check is made to ensure that the clamp is not in the marking position. If the tracking disk (D1) is missing, a safety microswitch cuts off power to the tracking circuit.

## 4.2 Securing the keys

Take the clamp to the "tracking" position to facilitate positioning of the key. Ensure that the glass slide diffusor (P) is not in the way by rotating it outwards with knob (P1) (fig. 13).

- 1) loosen the jaw-locking knob (G1);
- 2) select the side of the key to be marked, push the clamp (G) (fig. 13) and place the key with its back on the right-hand (F2) or left-hand (F3) stop, according to the shape of the profile; keys with cuts on both sides must be positioned in the centre and secured with the clamp inside the groove (fig. 14).
- 3) move the clamp (G) into the ideal position for securing the key (inside the groove) and tighten the knob (G1); the clamp (G) can be moved a maximum of 10 mm along the X axis.
- 4) loosen the locking knob (F), move the clamp slide (E) so that the key head is butting against the head stop (F1) and lock the slide with the knob (F).
- 5) to position other keys with the same features, simply adjust the clamp (G).

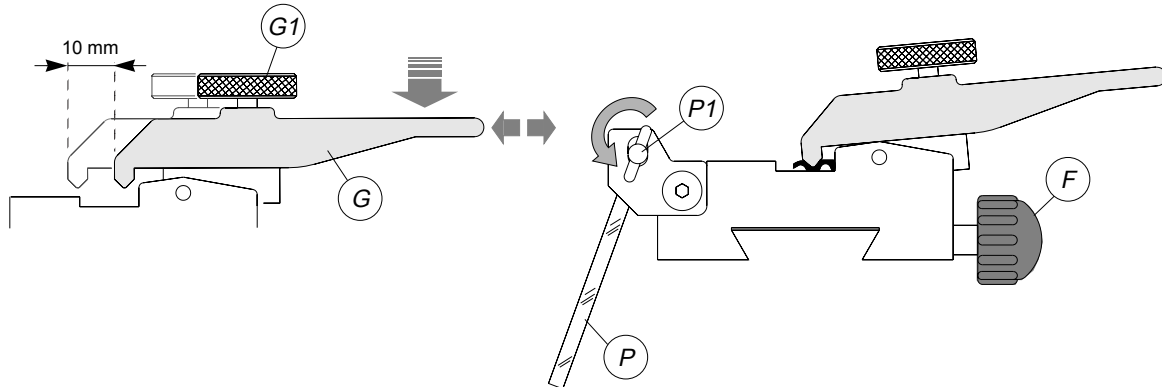


Fig. 13

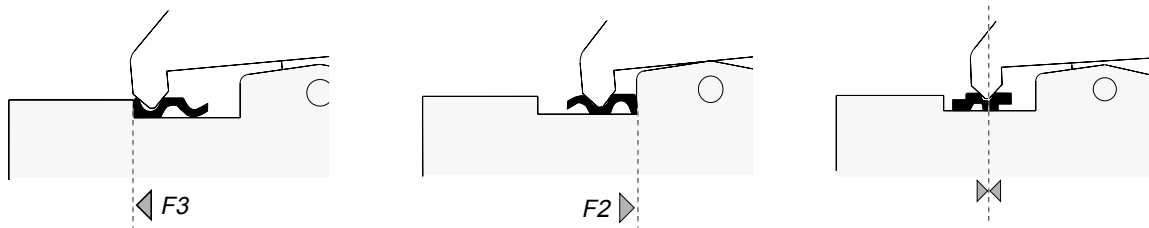


Fig. 14

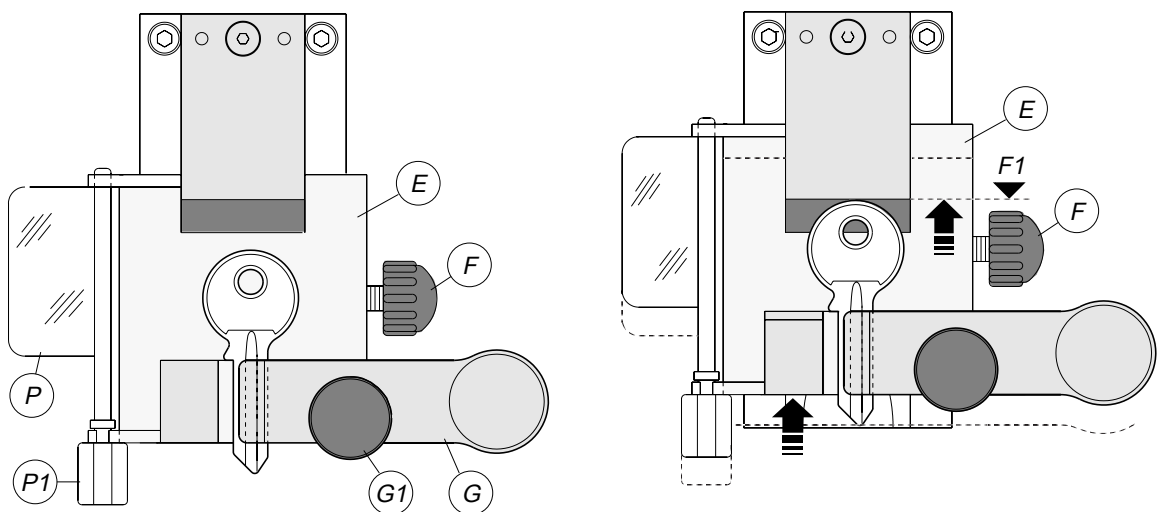


Fig. 15

### 4.3 Tracking

Tracking defines the area in which the text will be contained.  
It comprises the following main parts:

- **Laser**
- **Tracking disk (D1) with marking zone selection**
- **Glass slide diffusor (P)**

By the combination of laser beam, disk and glass slide diffusor the marking zone is projected onto the head of the key.

The tracking disk (D1) includes eight marking zones of different sizes and shapes (fig. 16). Other versions are available on request.

**WARNING:** for tracking, always place the glass slide (P) over the key, otherwise the shiny surface of the key will prevent good visibility of the projected area (fig. 17 - position 1). When the tracking operation has been carried out, the glass slide (P) must be returned to position 2.

For the operator's safety, activation of the laser beam is electronically controlled and check is made to ensure that the clamp is not in the marking position. If the tracking disk (D1) is missing, a safety microswitch cuts off power to the tracking.

#### Replacing the disk:

- 1) loosen the knob (D2) (fig. 16).
- 2) remove the disk (D1) and replace.
- 3) tighten the knob (D2).

MARKING ZONES (scale 1:1)

1	15 mm x 3.5 mm
2	15 mm x 6.5 mm
3	15 mm x 9.5 mm
4	20 mm x 6.5 mm
5	20 mm x 9.5 mm
6	20 mm x 12.5 mm
7	25 mm x 6.5 mm
8	25 mm x 10.5 mm

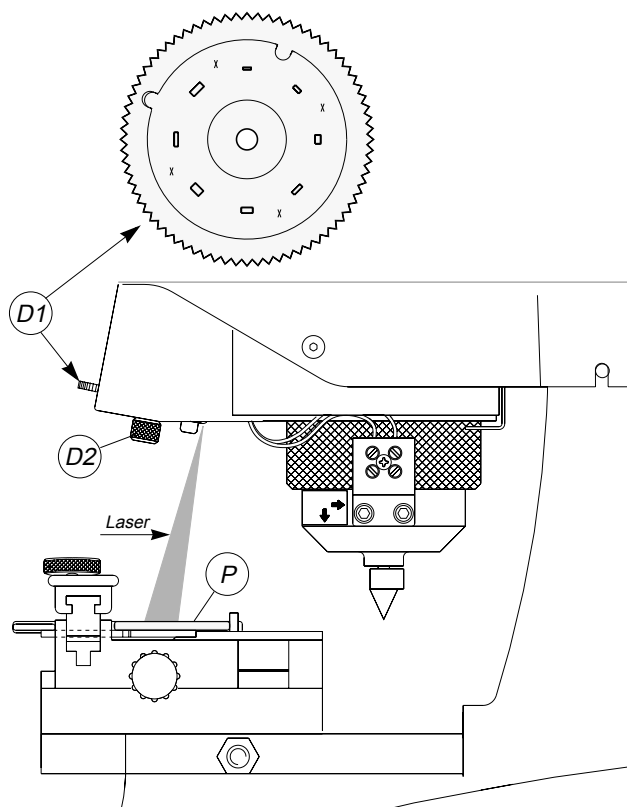


Fig. 16

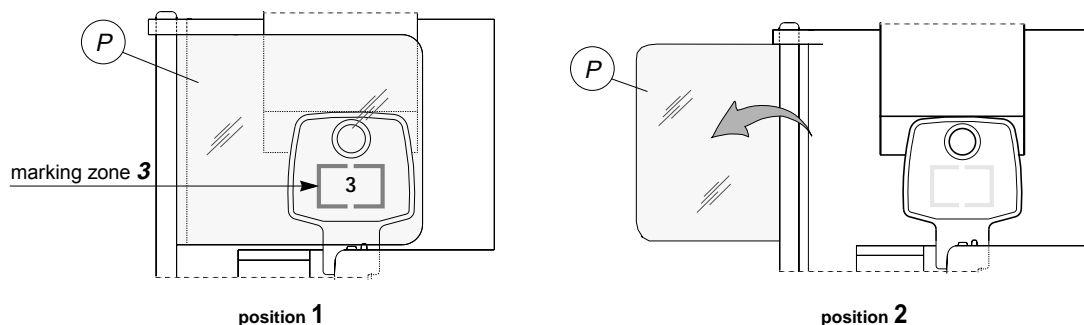


Fig. 17



#### 4.4 Marking punch regulation ring

The regulation ring (C) makes it possible to increase or decrease the distance between the punch and the surface to be marked. This distance, together with the type of material from which the key is made and the size of the chosen characters, affects the quality of the microdots used in marking.

The regulation plate (fig. 18) has 3 positions suitable for keys with a thickness of 1,5 mm, 2,5 mm and 3,5 mm.

When the ring (C) is placed in the position shown by the dotted line (2,5 mm) the machine is set on a standard distance ideal for marking key thickness of between 2 and 3 mm (fig. 18).

For special thickness and to alter the depression depth to the operator's requirements, use the regulating ring (C), bearing in mind that:

- turning the ring to the right lowers the point.

- turning the ring to the left raises the point.

**WARNING:** do not move the ring (C) beyond the black lines (relating to thickness 1,5mm and 3,5mm).

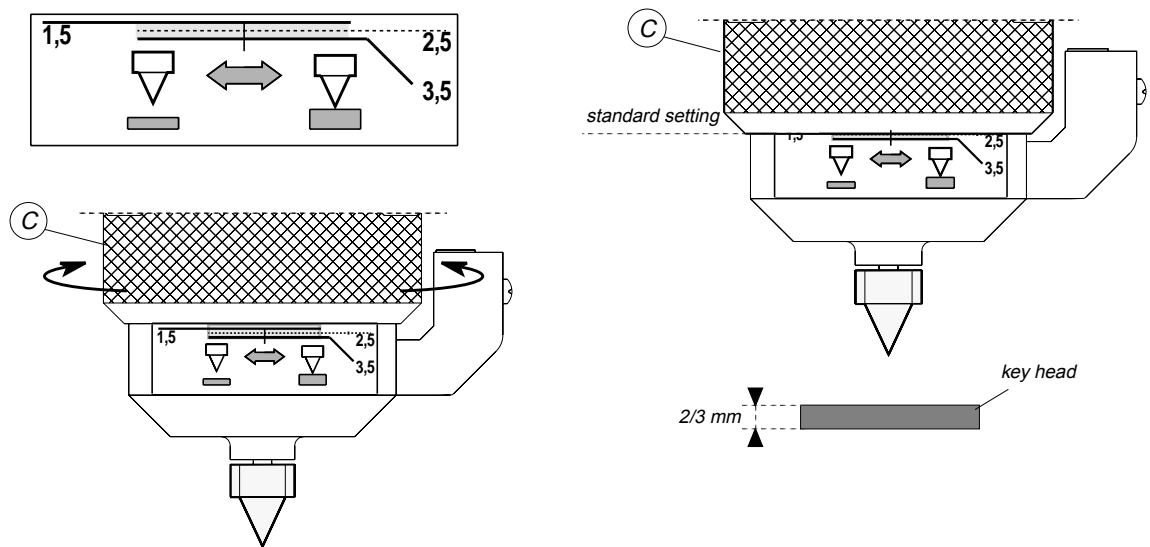


Fig. 18

#### 4.5 Marking

The marking method is that of punching onto a surface a series of dots which form letters, numbers and symbols.

Various fonts are available, such as: 6x8 8x8 8x14 8x16 12x14 (inclined)

For detailed information regarding the selection and use of the different fonts, see the software manual "MARKER 2000 PROGRAM".

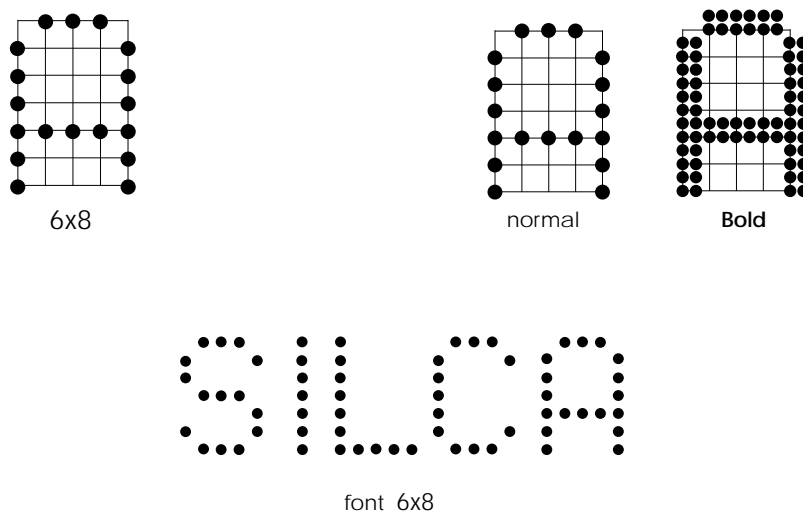


Fig. 19

## 5 INSTALLATION AND PRELIMINARY OPERATIONS [SET-UP]

The first operations to carry out are those of setting up: the language, type of keyboard connected and machine serial number.

When the machine is turned on, the display shows:

### SET-UP [F5]

Press F5 to set up the machine.

### LANGUAGE

Press the numerical key corresponding to the required language.

### KEYBOARD

Position the cursor on the "Keyboard" field and choose the correct number with the space bar key".

Confirm with ENTER.



### SERIAL NUMBER

The serial number field requires a full transcription of the number (if not already entered) engraved on the data plate on the back of the machine (fig. 2, page 2).

Confirm the number with ENTER and exit from the Set-up menu with ESC; the data are memorized.

### [F1] help

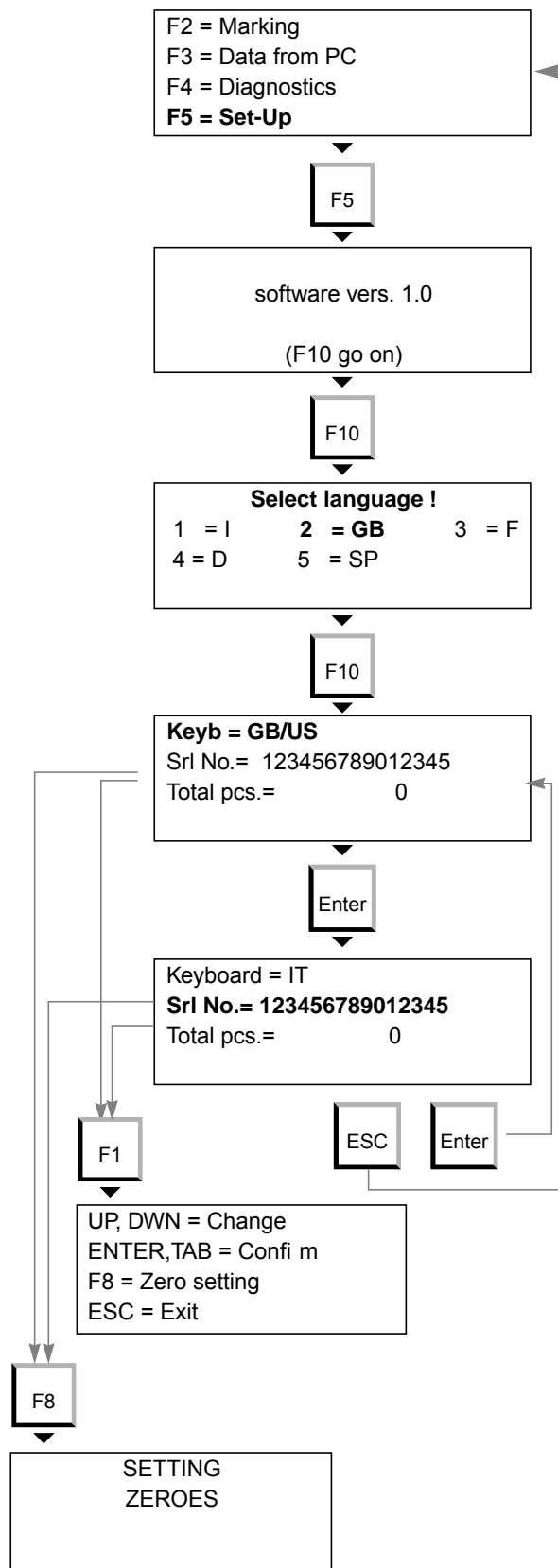
Key F1 gives access to the guide:

UP, DOWN: use the arrow keys   on the keyboard to change the parameters available for each field and confirm with Enter.

ENTER, TAB: confirm the selected number.

F8: for regulation when sensors are replaced for "tracking" adjustment (ch.7 "SETTING THE ZEROES [F8]"). For this operation carefully follow the instructions appearing on the screen to set zeroes.

ESC: exits from the guide function.



## 6 MARKING [F2]

The marking program now includes a basic concept of a 'model', associated to which are:

- configuration parameters
- a text and/or special functions
- a name to identify the model

This chapter describes all the procedures for the **creation of a model** and **marking**.

Press F2 from the main menu:

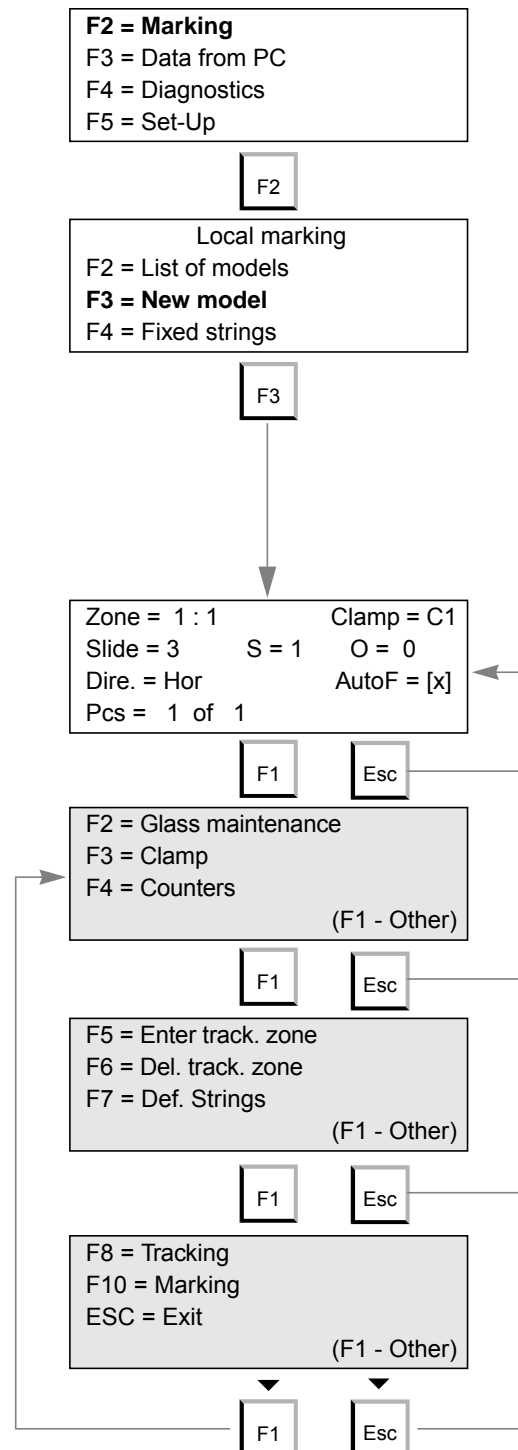
### 6.1 New Model [F3]

Press F3 to create a "new model" of marking.  
The model of text can have a minimum of 1 line and a maximum of 4. The following information is associated with the text: position of the text on the object to be marked (key, cylinder, etc.), tracking of the area to be marked, with co-ordinates, type of clamp.

#### [F1] help

Press key F1 for access to the guide.

**WARNING:** all the functions (F2-F3-F4 ...) described in the *Help* section are enabled exclusively in this menu.



### 6.1.1 Definition of model parameters

**Zone:** indicates the tracking area selected. (see ch. 4.3, page 12).

**Clamp:** indicates the clamp currently in use.

**Glass slide:** indicates the type of glass slide selected.

**S=** parameter used exclusively for optional clamp "A5".

**O = orientation** (see fig. 20)

**DIR = direction** (see fig. 20)

**Autof = Auto-formatting** (see ch. 6.1.2, page 16)

To scroll the data for glass slide, clamp, orientation and direction, use the ENTER, TAB keys and confirm with ENTER.

The number of pieces should be entered with the numerical keys on the keypad.

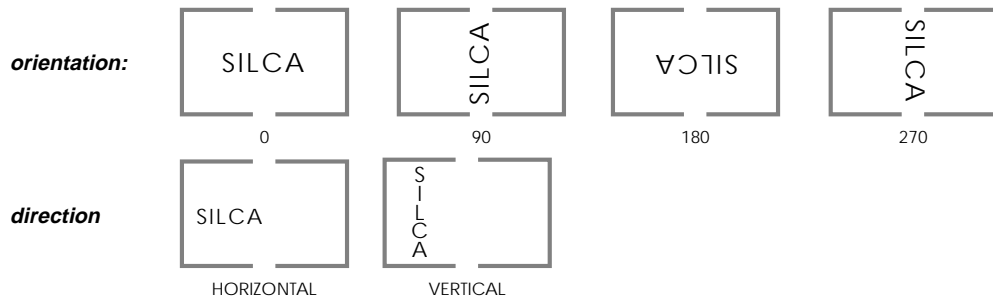


Fig. 20

### 6.1.2 String definition [F7] – text entry

To enter the required text, press F7.

#### AUTOMATIC FORMATTING

The machine program formats the entered text automatically according to the glass slide area selected (fig. 21). With this function all texts have centered alignment (consult ch. 6.1.2-a to personalize the text format).

The text to be marked can be formed by 4 strings of 30 characters each and can contain small or capital letters.

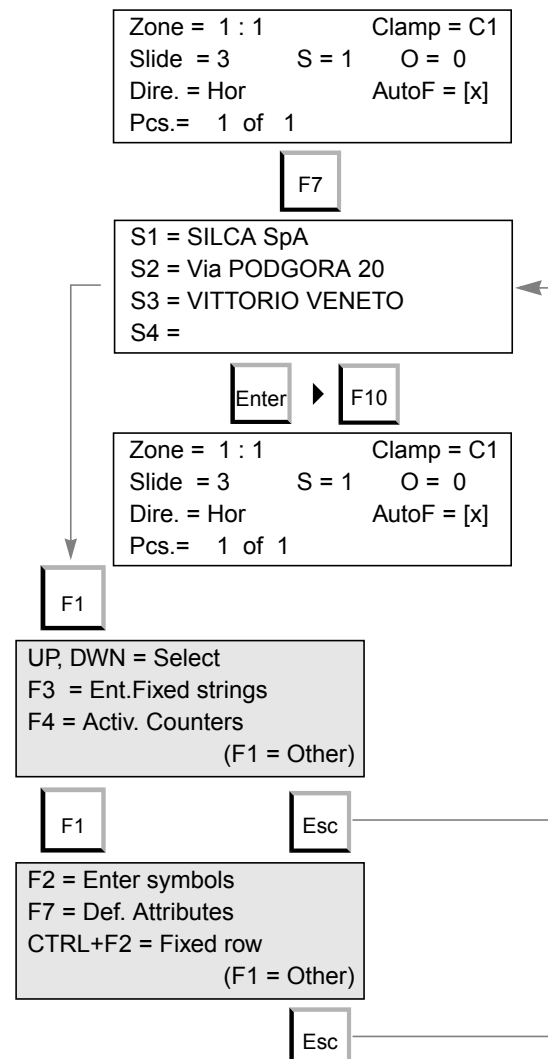
The text to enter for each string may be entered by hand through the keyboard or 'fixed strings', 'automatic counters' or 'special symbols' can be entered (for further details see the following paragraphs).

After entering the first line (S1), go on to the second by pressing the ENTER key:

#### [F1] help

Press key F1 to gain access to the guide.

For further details of the functions listed in the Help menu, consult Ch. 6.4 "SPECIAL FUNCTIONS".



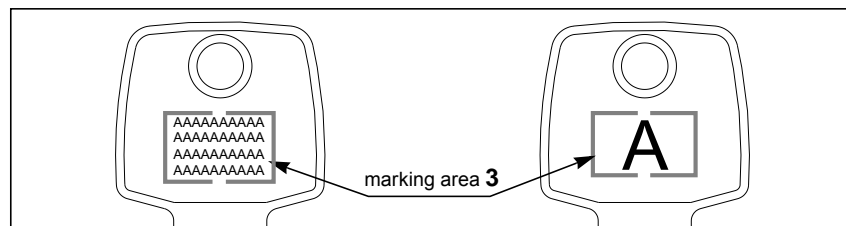
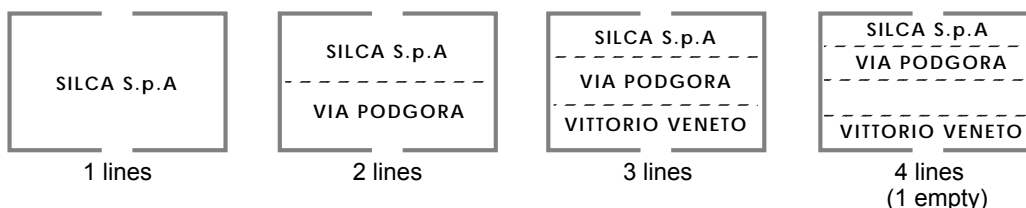


Fig. 21

**WARNING:** the program gives activation of automatic formatting by default (AutoF = [x]); this function is therefore always active. However, the operator may change two marking method parameters per string without compromising or altering the automatic formatting function:

- 1) Bold or standard    2) font (6x8, 8x8 ...)

See ch 6.1.2-a "Attributes definition [F7]" for instructions on how to alter the two parameters.  
The following illustrations show examples of marking for different numbers of texts:



The marking area is sub-divided into the number of sections corresponding to the number of texts to be marked and the text for each line is positioned in the centre of its area.

### 6.1.2-a Attributes definition [F7]

#### MARKING WITH CUSTOMIZED FORMATTING

Texts are customized for marking by setting different parameters on the marking area, such as: type of character, height of character, ratio, alignment etc. To alter attributes, place the cursor on the line concerned and press F7 to proceed.  
(example: SILCA SpA).

The display shows the parameters which can be altered:

Press the ENTER key to select the parameter to be altered and use the arrow keys to scroll the options:

Hgt. (height): min.1.0 mm - max.6.5 mm

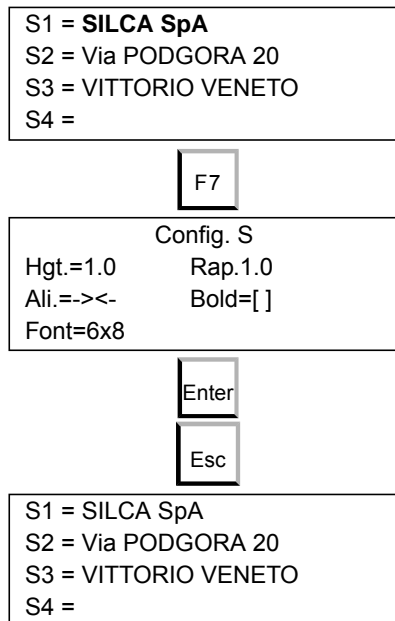
Rat. (scale): min.0.2 - max 2

All. (alignment): -><- centred; ---> right; <--- left;

Bold: [ x ] bold [ ] normal

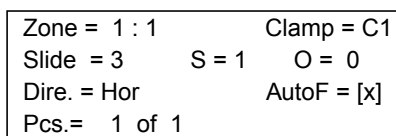
Font: there are 5 alternatives 6x8 8x8 8x14 8x16 12x14 (ch.4.5).

Press ESC to exit from the menu.



**WARNING:** as can be seen on the display, during this operation the field relating to "automatic formatting" is not activated (AutoF [ ]) indicating that "customized marking" is being used (fig. 22). However, the operator may return at any moment to automatic formatting of the text by placing the cursor in the "AutoF[x]" field (with the ENTER, TAB keys) and entering an "x" (AutoF [x]).

Fig. 22



**6.1.2-b Entering fixed strings [F3]**

see ch. 6.4 "SPECIAL FUNCTIONS", page 26.

**6.1.2-c Entering the automatic counters [F4]**

see ch. 6.4 "SPECIAL FUNCTIONS", page 26.

**6.1.2-d Entering symbols [F2]**

see ch. 6.4 "SPECIAL FUNCTIONS", page 26.

**6.1.2-e Fixed lines (CTRL+F2)**

see ch. 6.4 "SPECIAL FUNCTIONS", page 26.

**6.1.3 Tracking [F8]**

Proceed with this function to centre the glass slide over the surface of the key to be marked.

Position the key to be marked on the clamp (ch.4.2, page 11) and press key F8 to proceed with tracking.

**WARNING:** if the clamp is not in the "tracking" position the following message appears:

Take the clamp to the "tracking" position (see ch.4.1, page 10).

Select required glass slide area by means of disk (D1) (ch. 4.3, page 12) and enter the number of the area selected in the highlighted field: "Slide" using the  $\boxed{+}$   $\boxed{-}$  keys on the numerical keyboard.

When the F8 key is activated the machine zeroes the X-Y axes and the laser is turned on. The beam projects the marking zone onto an area distant from the object to be marked.

Use the arrow keys  $\boxed{\leftarrow}$   $\boxed{\rightarrow}$   $\boxed{\uparrow}$   $\boxed{\downarrow}$  to establish the position of the marking zone.

As can be seen on the last line of the display, certain symbols appear next to the glass slide number (glass slide = 3). The symbols available which may appear are:

$\rightarrow \downarrow$  : show the direction to take when placing the glass slide in the available working area. Move with the  $\boxed{\rightarrow}$  and  $\boxed{\downarrow}$  keys.

[ ] : this symbol indicates that the glass slide chosen fits perfectly into the working area available.

Save the tracking co-ordinates by pressing F10:

If a number of tracking areas have been entered (ch.6.1.9), use the keys  $\boxed{\uparrow}$  **PgUp** and  $\boxed{\downarrow}$  **PgDown** to go on from one area to the other.

Repeat the tracking procedure described above for each new area.

If a customized glass slide is being used (ch.6.1.6), as there is no corresponding data on the diskette (D1) (ch. 4.3, page 12), use glass slide No. 1 to centre the area during tracking.

```
Zone = 1 : 1      Clamp = C1
Slide = 3        S = 1      O = 0
Dire. = Hor      AutoF = [x]
Pcs.= 1 of 1
```

**F8**

```
Tracking zone = 1
Clamp out
position
```

```
Slide = 3 → ↓
```

```
Tracking zone = 1
F10 to proceed.
```

```
Slide = 3 → ↓
```

**F10**

```
Tracking zone = 1
Use arrow keys to
modify tracking
```

```
Slide = 3 → ↓
```

```
Tracking area = 1
Use arrow keys to
modify tracking
Slide = 3 [ ]
```

**F10**

```
Zone = 1 : 1      Clamp = C1
Slide = 3        S = 1      O = 0
Dire. = Hor      AutoF = [x]
Pcs.= 1 of 1
```

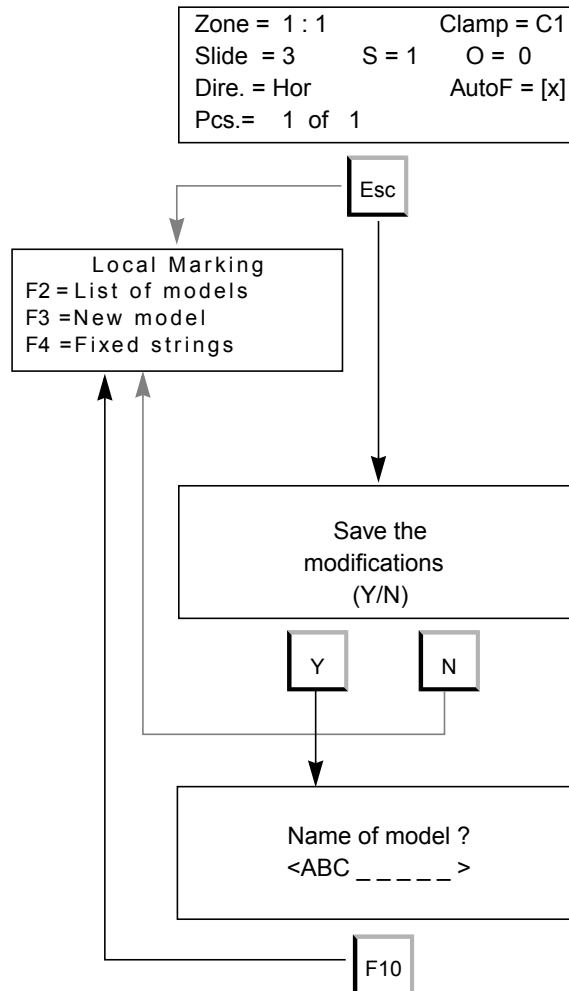
### 6.1.4 Save model

The operator may now save or lose all the information relating to the Model just created.

- If the marking parameters have not been altered, press the ESC key to return to the Local Marking menu.
- If the text is saved (Y = Yes), give a name to the model, which will be included in the list of models (ch. 6.3, page 24).
- If the text is not saved (N = no) the data entered will be eliminated.

Press F10 to confirm.

- If the operator saves the text created, the name will appear in the list of models.



### 6.1.5 Marking [F10]

Before marking, place the key in position on the clamp (ch. 4.2, page 11) and take the clamp into the 'marking' position (ch.4.1, page 10).

**WARNING:** before taking the clamp into the marking position, turn the glass slide outwards (position 2 - fig. 17, page 12).

Carry out marking by pressing F10.

- If the parameters set generate a text with dimensions unacceptable for the area selected, an error message appears:

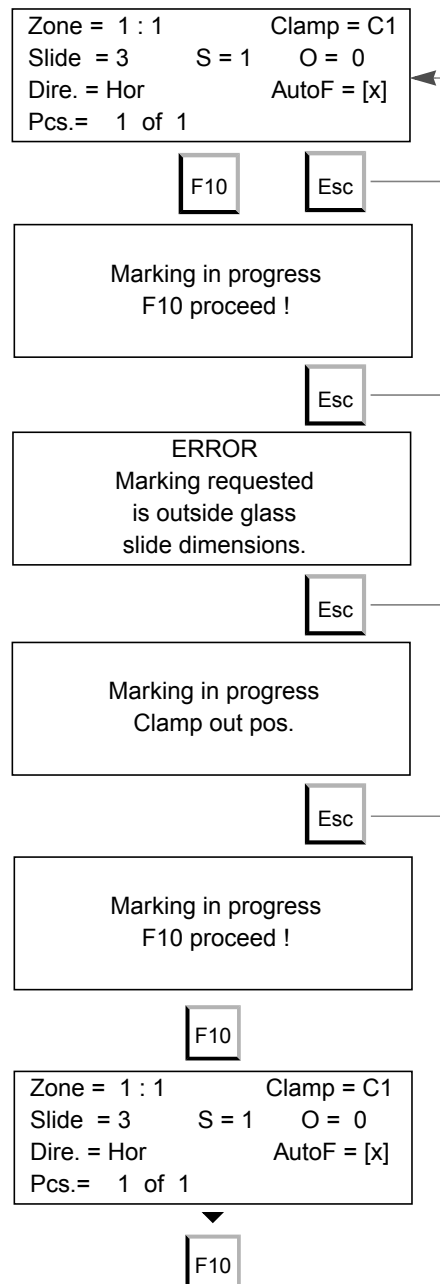
As the program is aware that a text with such dimensions will not fit into the area selected it advises changing the text parameters or choosing a bigger marking zone, if possible).

- if the clamp is not in the 'marking' position the following message appears:

take the clamp to the 'marking' position (ch. 4.1, page 10).

When marking has been carried out the field re-appears:

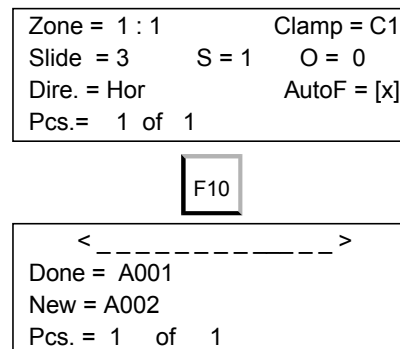
- If the previously set number of pieces to be marked is "1" the marking operation can be repeated on another key by pressing key F10.
- If more than one piece has been set, the program automatically checks the progress of the number of pieces.



#### 6.1.5-a Marking by counters

If counters have been included in the model to be marked (see ch. 6.4.2) the following message appears on the display at the end of the first marking cycle described above:

Press F10 repeatedly to completion of the marking cycle.







### 6.1.6 Glass slide customization [F2]

The program includes the possibility to define customized glass slides. Whenever the screen shows data for the model, access can be gained, through key F2, to the glass slide customization menu.

Press key F2 to show the data for the glass slide setting.

**WARNING:** the first 16 glass slides have been set up by Silca and cannot be altered.

Use the arrow keys   to scroll the list of glass slides.

Use the TAB key to move from one line to another.

Press ENTER to confirm the datum entered.

Use the CANC key to delete a glass slide.

Zone = 1 : 1      Clamp = C1  
Slide = 3      S = 1      O = 0  
Dire. = Hor      AutoF = [x]  
Pcs.= 1 of 1

F2

SILCA glass slide  
Glass slide N. =  
Width =  
Height =

**WARNING:** dimensions are expressed in hundredths of a millimetre.

When creating a glass slide the user must observe the minimum and maximum dimensions, which are:

**Height:** min. 10 - max 3500 (hundredths of a mm)

**Width:** min. 10 - max 5000 (hundredths of a mm)

**Note:** when a new glass slide has been set up, on leaving the function it is recognized by the machine as the current glass slide.

### 6.1.7 Clamp configuration [F3]

Function enabled only with the optional clamp "A5".

Zone = 1 : 1      Clamp = A5  
Slide = 3      S = 1      O = 0  
Dire. = Hor      AutoF = [x]  
Pcs.= 1 of 1

### 6.1.8 Counters [F4]

If a counter has been previously entered into the model, press key F4 to gain immediate access to the counter definition menu.

Consult Ch. 6.4.2 for further information on counter parameters.

Zone = 1 : 1      Clamp = C1  
Slide = 3      S = 1      O = 0  
Dire. = Hor      AutoF = [x]  
Pcs.= 1 of 1

F4

From = A001  
To = A100  
Att. = A001  
Incr. = 1

F10

### 6.1.9 Entering a new tracking zone [F5]

A maximum of four tracking zones can be set for the same number of different markings. This means that every 'model' can comprise four texts positioned independently of each other, with different formatting parameters (fig. 23).

In this way a key can be marked in four tracking zones which are positioned separately from each other.

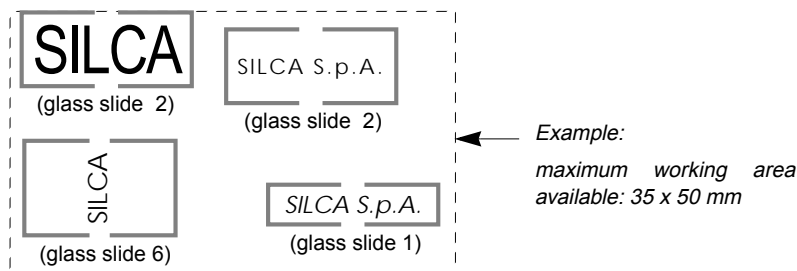


Fig. 23

When F5 is pressed this message appears:

If N (no) is pressed the display returns to the main screen display:

If Y (yes) is pressed a new zone is presented for setting:

When the new tracking zone has been entered, move from one zone to the other with the arrow keys .

If a number of tracking areas have been included, use the keys PgUp and PgDown to go from one area to the other.

See ch. 6.1.3 "Tracking [F8]" to track the new area entered.

Zone = 1 : 1      Clamp = C1  
Slide = 3      S = 1      O = 0  
Dire. = Hor      AutoF = [x]  
Pcs.= 1 of 1

F5

Add a new  
tracking zone?  
( Y / N )

Y

N

Zone = 1 : 1      Clamp = C1  
Slide = 3      S = 1      O = 0  
Dire. = Hor      AutoF = [x]  
Pcs.= 1 of 1

**Zone = 2 : 2**      Clamp = C1  
Slide = 3      S = 1      O = 0  
Dire. = Hor      AutoF = [x]  
Pcs.= 1 of 1

### 6.1.10 Deletion of a tracking area [F6]

Select the area to be deleted and press key F6.

A new message will appear on the display: press

= Yes, or = No.

**WARNING:** all texts and their parameters associated with this zone will be deleted.

Zone = 2 : 2      Clamp = C1  
Slide = 3      S = 1      O = 0  
Dire. = Hor      AutoF = [x]  
Pcs.= 1 of 1

F6

Delete  
tracking zone ?  
( Y / N )

Y

N

Zone = 1 : 1      Clamp = C1  
Slide = 3      S = 1      O = 0  
Dire. = Hor      AutoF = [x]  
Pcs.= 1 of 1

## 6.2 Fixed strings [F4]

A "string" is any text, such as: name, surname, address, telephone number, etc.

The operator can place in the memory up to 50 fixed strings, each made up of a maximum of 30 characters.

When creating models a string can be used any number of times.

**WARNING:** if a "fixed string" is altered, all the models containing it are automatically updated.

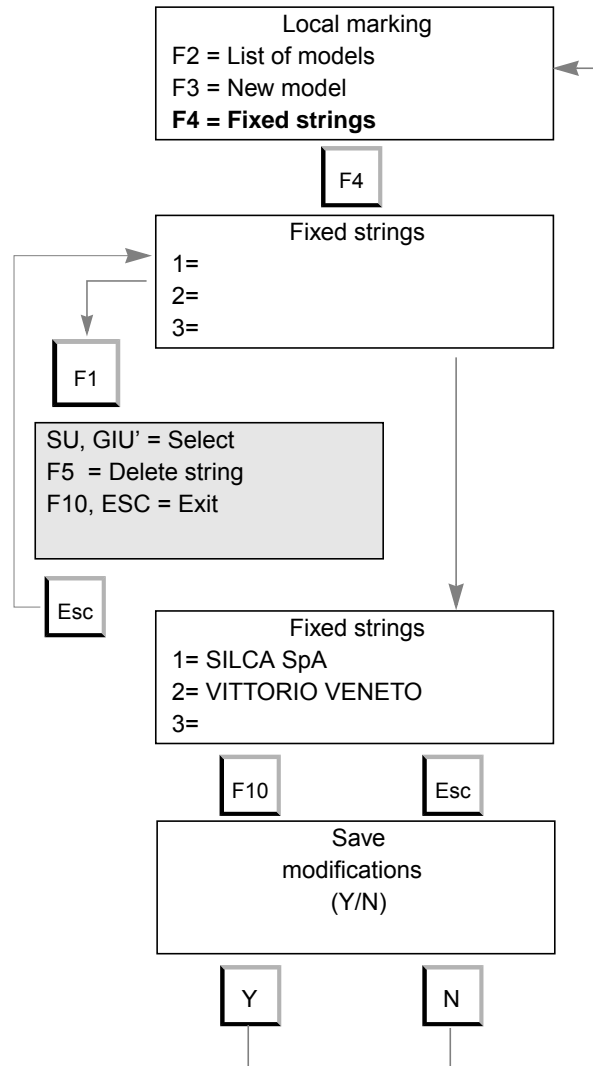
If a "fixed string" is deleted this automatically disappears from all the models containing it and the progressive number identifying it in the "fixed string" list remains empty until a new one is entered.

### [F1] help

Press key F1 to gain access to the guide.

Each time a fixed string is created, press key F10 to confirm and the ESC key to quit.

The program asks whether the string created should be saved; if the string is saved (Y = Yes) the "Fixed string" list is automatically updated.



### 6.2.1 Deletion of fixed strings [F5]

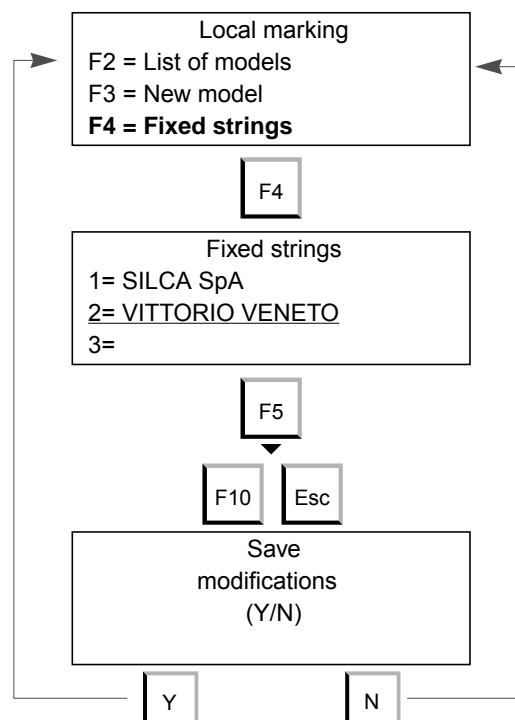
Use the arrow keys to position the cursor on the string to be deleted.

Press F5: the string is deleted.

Confirm with F10.

When Y (Yes) is pressed, deletion is definite and the string is no longer in the list when the menu is entered.

When N (No) is pressed, deletion does not take place and the string remains in the list.



### 6.3 List of models [F2]

The 'List of Models' contains all the models created and memorized in the marker, up to a maximum of 50.  
Press F2 to access the full list of models.

**[TEMPORARY] This is a memory area used for the automatic saving of the current model being marked.**

It allows the operator to interrupt the marking operation at any time, even if a "name of model" has not been entered (by turning off the machine with the master switch or turning off the electricity supply).  
When the machine is turned on again the "temporary" model in the "List of models" menu represents all the parameters set, up to the last operation carried out before interruption.

#### [F1] help

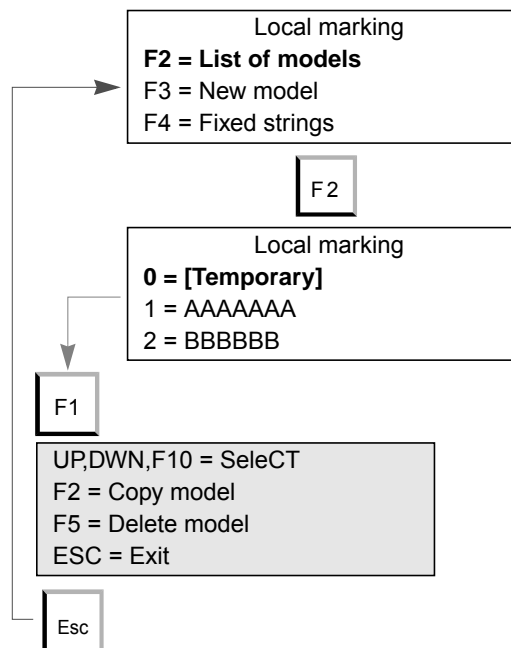
Access is gained to the guide by pressing F1.

UP, DOWN, F10:   arrow keys to select the model required and F10 to proceed



F2: to save the current model with another name

F5: to delete the selected model

ESC: to exit from the menu



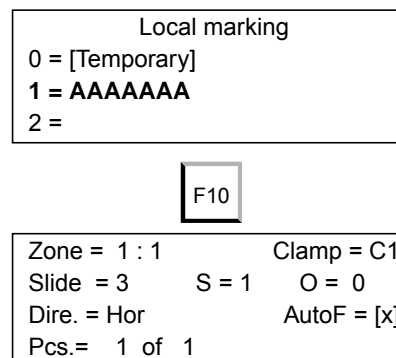
#### 6.3.1 Altering the model [F10]

Use the arrow keys   to select the model to be altered.

Press F10.

Parameters and text for the selected model can then be altered:

**Note:** for alteration of parameters and entry of text see ch. 6.1 "New Model [F3]", page 15.



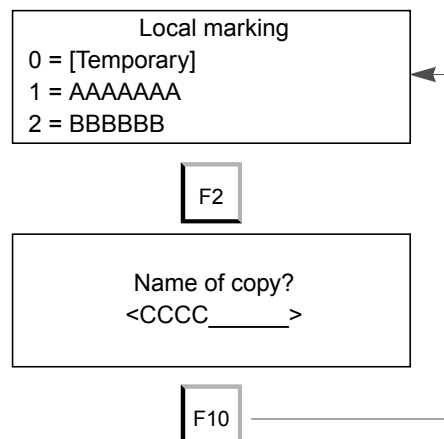
#### 6.3.2 Copy model [F2].

Option with which to copy an existing model with another name.

This function considerably speeds up the marking operations by avoiding the whole procedure for entering data, parameters, tracking, etc. for a model similar to an existing one.

To copy, place the cursor in position on the model and press key F2.

Enter the new name for the model and press F10 to confirm.



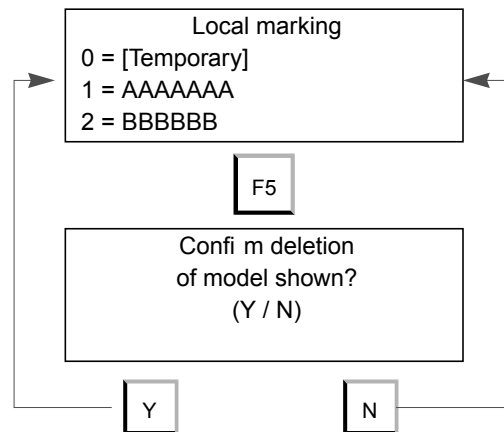
### 6.3.3 Delete model [F5]

This function makes it possible to delete a model from the list of models.

Position the cursor on the model to be eliminated and press key F5.  
The model will cease to appear in the list.

When Y (Yes) is pressed deletion is permanent and the model will no longer appear in the list the next time it is accessed.

When N (No) is pressed deletion is not carried out and the model continues to appear in the list.





## 6.4 SPECIAL FUNCTIONS

### 6.4.1 Entering fixed strings [F3]

When generating a text (New Model) one or more strings from the "fixed string" list can be included (see ch. 6.1.2, page 16).

Go to the "New model" function (ch. 6.1, page 15). From any of the lines press key F3 to display the list of fixed strings.

Select the string required with the   arrow keys.

Position the cursor on the string and press F10. The progressive number of the selected string is displayed.

Each line of the model being created by the operator may contain a maximum of one fixed string.

The limit of 30 characters for each line of text remains valid.

The string takes on the characteristics of a standard text and can be defined with automatic or customized formatting.

S1=  
S2=  
S3=  
S4=

F3

Fixed strings

1=  
**2= VITTORIO VENETO**  
3=



F10

S1= [02]  
S2=  
S3=  
S4=

**Note:** fixed strings cannot be added to or modified during the entering operations for the current model; to modify or to add something recall the "Fixed strings" function [F4] from the main menu.

### 6.4.2 Entry of automatic counters [F4]

Press key F4.

Use the arrow keys   to select the type of counter required and press F10 to confirm.

- **(01) Alphanumeric Progressive**

This function makes it possible to generate a progressively numbered series to be marked.

(E.g.: A001, A002, A003.. up to code A100).

Go to the "New model" function, to the position:

On the first line enter the first number of the series to be marked and confirm with ENTER.

On the second line enter the last number of the series and confirm with ENTER.

Incr. = increase

The increase set by default is 1 so that during the marking operation the program generates a sequential list of data with increases of one unit.

E.g.: Incr. 1: A001 - A002 - A003 ...

E.g.: Incr. 3: A001 - A004 - A007 ...

**WARNING:** alphanumeric lists cannot be generated as the program considers only numerical characters in the marking sequence and does not modify letters.

When confirmation has been given with F10 a number is displayed to identify the "automatic counter" function.

The automatic counter function can also have automatic or customized formatting.

**Note:** for marking see ch.6.1.5 and 6.1.5-a, page 20.

S1 =  
S2 =  
S3 =  
S4 =

F4

Functions

**(01) = Alphanum. prog.**  
(02) = Double prog.

F10

From: A001  
to: **A100**  
Att. : A001  
Incr. 1

F10

S1= {01}  
S2=  
S3=  
S4=

- **(02) Double Progressive**

This function is similar to the previous one (01). With it a progressive numerical series can be generated for marking, with the addition of a counter connected to the number of pieces.

Example with 3 pcs to be marked:

A001 1  
A001 2  
A001 3



A002 1  
A002 2  
A002 3

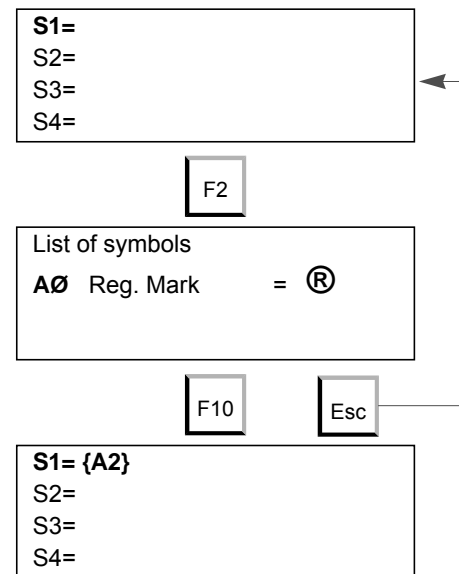
....  
A100 1  
A100 2  
A100 3  
....

### 6.4.3 Entering symbols [F2]

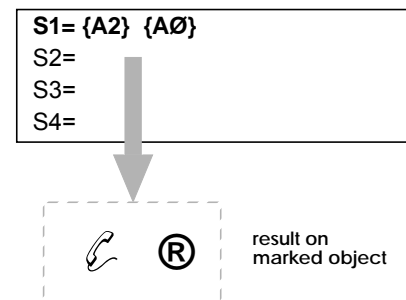
Certain special symbols can be marked.  
One symbol can be entered for each line available.




When the F2 key is pressed during text entry, the display shows:

Use the arrow keys   to scroll all the special symbols available (a descriptive text + the relative symbol by way of example).  
Press key F10 to confirm the symbol selected.  
In the place of the symbol itself, an abbreviated description of it appears in brackets.

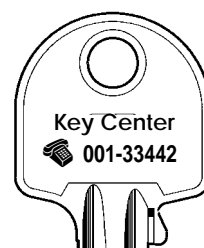


Special symbols can be used, also one after the other (see example on the right):



Special symblos available (*)	
<i>symblos</i>	<i>corresponding to</i>
®	{A0}
©	{A1}
	{A2}
	{A3}
	{A4}

(\*) New symbols may be added to the list in the future.



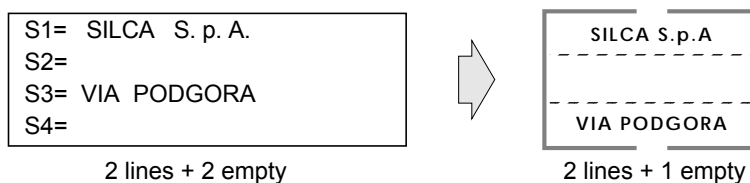
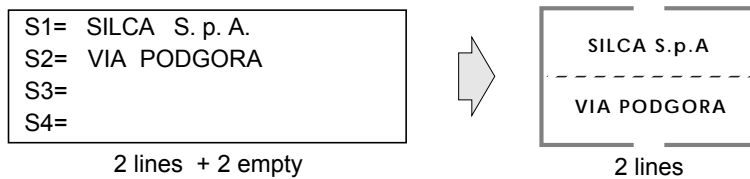
 Via DANTE, 7  
.....

Examples of the use of special symbols

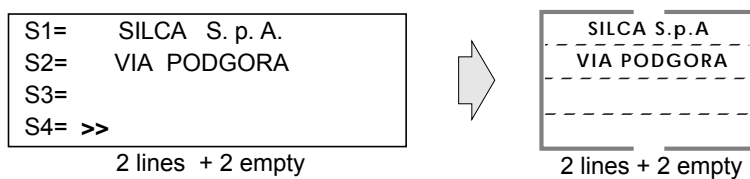
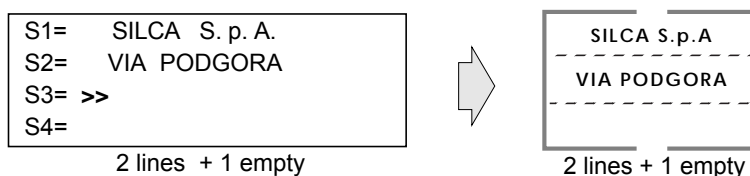
Fig. 24

#### 6.4.4 Fixed lines (CTRL+F2)

As described in the chapter.6.1.2, page 16, each marking area is subdivided equally into as many different parts as there are lines to be marked, except where the last lines are blank.



To force the subdivision of a marking area, even with one or more blank lines, use CTRL + F2 to enter the character ">>" into the last blank line to be considered.





## 6.4.5 Special characters

The set of characters which can be used by the electronic marking machine includes all those in the ANSI table.

If the character required is not on the keyboard connected to the marking machine, it can be entered through a combination of keys:

**Alt** + <table number>

Example with an English keyboard: to enter Å press the **Alt** + **196**.

The numbers are available on the numerical section of the keyboard, situated on the right.

0		32		64	@	96		128		160		192	Å	224	à
1		33	!	65	A	97	a	129		161	i	193	Á	225	á
2		34	"	66	B	98	b	130		162	ç	194	Â	226	â
3		35	#	67	C	99	c	131		163	£	195	Ã	227	ã
4		36	\$	68	D	100	d	132		164		196	Ä	228	ä
5		37	%	69	E	101	e	133		165		197	Å	229	å
6		38	&	70	F	102	f	134		166		198	Æ	230	æ
7		39	'	71	G	103	g	135		167		199	Ç	231	ç
8		40	(	72	H	104	h	136		168		200	È	232	è
9		41	)	73	I	105	i	137		169		201	É	233	é
10		42	*	74	J	106	j	138		170		202	Ê	234	ê
11		43	+	75	K	107	k	139		171		203	Ë	235	ë
12		44	,	76	L	108	l	140		172		204	Ì	236	ì
13		45	-	77	M	109	m	141		173		205	Í	237	í
14		46	.	78	N	110	n	142		174		206	Î	238	î
15		47	/	79	O	111	o	143		175		207	Ï	239	ï
16		48		80	P	112	p	144		176		208		240	
17		49	1	81	Q	113	q	145		177		209	Ñ	241	ñ
18		50	2	82	R	114	r	146		178		210	Ò	242	ò
19		51	3	83	S	115	s	147		179		211	Ó	243	ó
20		52	4	84	T	116	t	148		180		212	Ô	244	ô
21		53	5	85	U	117	u	149		181		213	Õ	245	õ
22		54	6	86	V	118	v	150		182		214	Ö	246	ö
23		55	7	87	W	119	w	151		183		215		247	
24		56	8	88	X	120	x	152		184		216	Ø	248	ø
25		57	9	89	Y	121	y	153		185		217	Ù	249	ù
26		58	:	90	Z	122	z	154		186		218	Ú	250	ú
27		59	;	91		123		155		187		219	Û	251	û
28		60	<	92	\	124		156		188		220	Ü	252	ü
29		61	=	93		125		157		189		221		253	
30		62	>	94	^	126	~	158		190		222		254	
31		63	?	95	_	127		159		191	ı	223	ß	255	ÿ

## 6.5 Data from PC [F3]

The marker is predisposed to receive models to be marked created on a PC through the Marker 2000 Program. Consult ch. 6.5.1 for further details on how to connect the marker to the PC and see the Marker 2000 Program Operating Manual for the method of transmitting the models created to the marker. Each model sent to the marker is memorized in the 'Data from PC' menu.

Press F3 to access the list of models received. As the models sent by the PC have the same characteristics as those created on the machine, the same functions (described in the initial paragraphs of chapter.6) are used to alter or mark them.

F2 = Marking  
**F3 = Data from PC**  
 F4 = Diagnostics  
 F5 = Set-Up

F3

Data from PC

1 = BBBB  
 2 = CCCC  
 3 =

### 6.5.1 Connecting MARKER 2000 to a Personal Computer

fig. 25 shows how to connect the MARKER 2000 to a Personal Computer. For information on the transmission of data from a PC to the marking machine, which can receive approximately 500 models, see the software manual "MARKER 2000 PROGRAM".

### 6.5.2 Transfer of data from Marker 2000 to Personal Computer

**Note:** for users in possession of the Marker 2000 Program

All the data (models, strings, etc.) stored in the marking machine memory can be copied onto the PC hard disc and used with the "MARKER 2000 Program".

This avoids re-entering the data into the MARKER 2000 Program.

**Read the instructions manual for the "MARKER 2000 PROGRAM".**

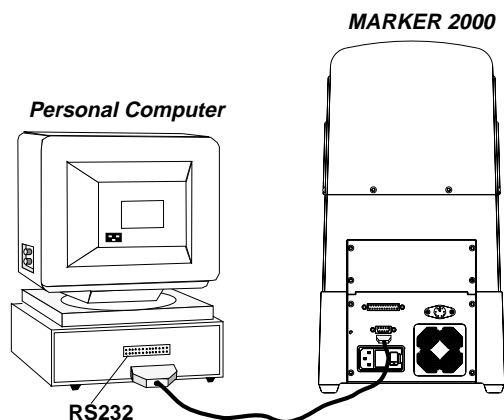


Fig. 25 - rear view

## 7 SETTING THE ZEROES [F8]

Repeat the operations listed in Ch. 5 "Installation and preliminary operations [SET-UP]", up to the following display:

Place the template (D5) in position on the clamp so that the top end butts against the stop "F1".

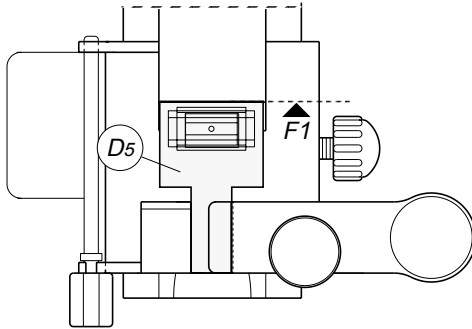


Fig. 26

Take the clamp into the "marking" position.

Hold the punch with two fingers and guide into the hole in the template (fig. 27) to establish the exact position of the punch.

Regulate the sensors.

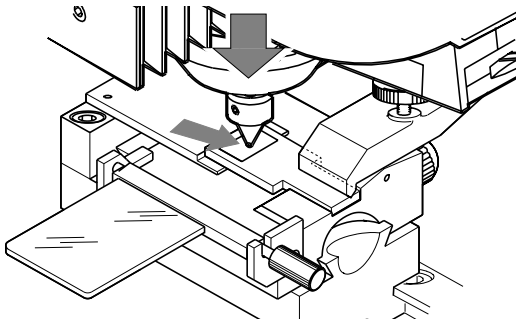


Fig. 27

### 7.1 Regulating the sensors

- 1) remove the upper cover (ch. 9.4) without disconnecting the connecting wire to the display.

#### **X axis sensor**

- 2) loosen the screws (X2) securing the plate (X1) (fig. 28).
- 3) move the plate manually over the X axis plate up to the exact point at which OFF passes to ON.

#### **Y axis sensor**

- 4) loosen the screws (Y2) securing the plate (Y1) (fig. 28).
- 5) move the plate manually over the Y axis plate up to the exact point at which OFF passes to ON

Tast.= IT  
Matr.= 123456789012345  
Pcs. tot.= 0

F8

Fit template  
to clamp and place in  
marking position  
(F10=Go on)

F10

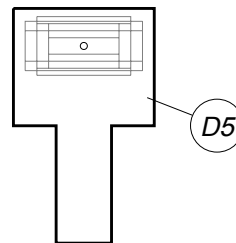
Take point to hole  
manually.

(F10=Go on)

F10

Regulate sensor  
position.

ICX=OFF ICY=OFF  
(F10=Go on)



F10

Regulate sensor  
position.

ICX=ON ICY=OFF  
(F10=Go on)

Regulate sensor  
position.

ICX=ON ICY=ON  
(F10=Go on)

F10

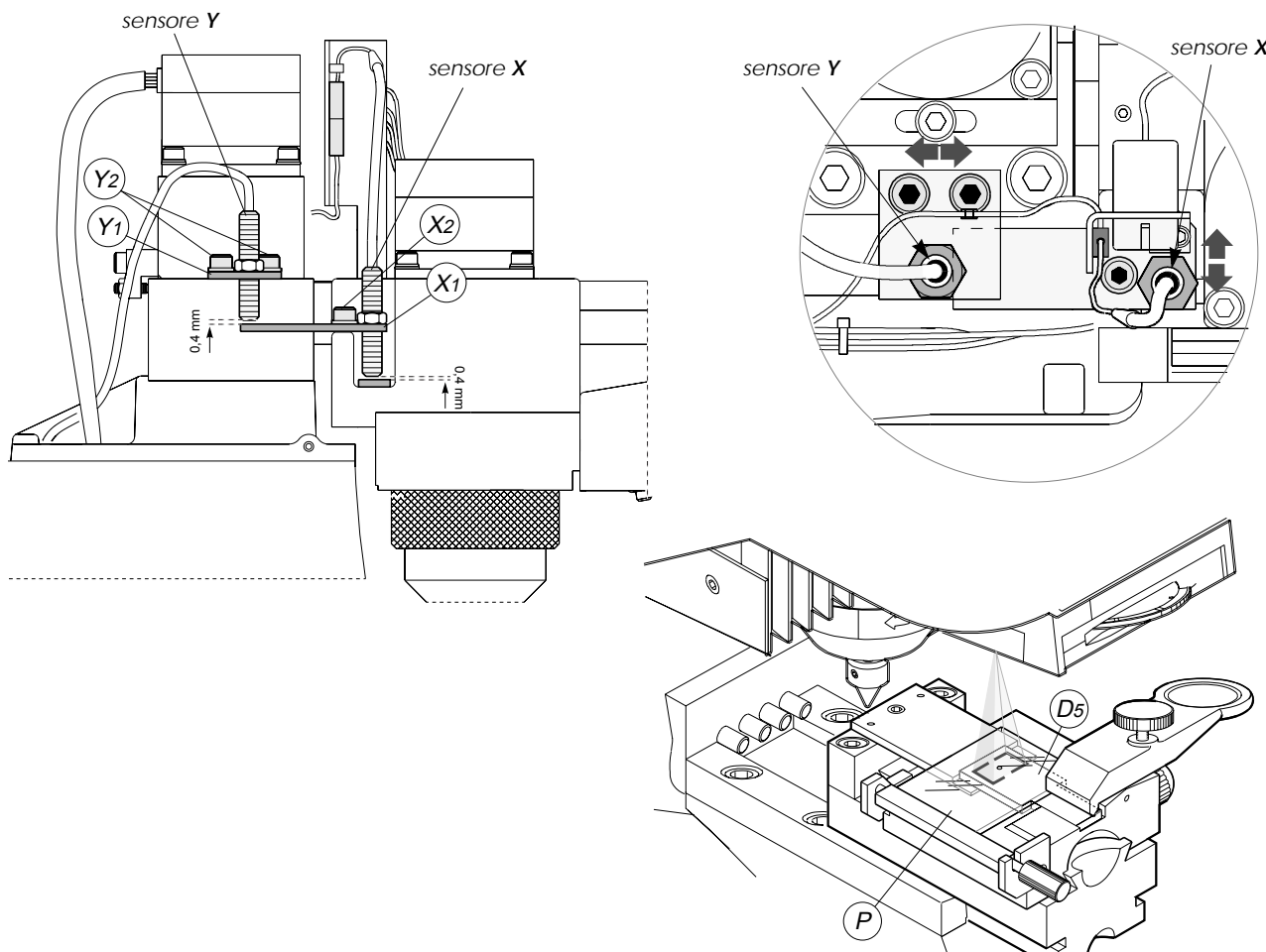


Fig. 28

**WARNING:** position the glass slide (P) over the key (fig. 28).

Place the clamp in the "tracking" position.

Move the disk (marking area) until glass slide No.1 is selected. Superimpose the projected area on the figure engraved on the template corresponding to glass 1.

Use the arrow keys .

When the area is properly superimposed, press F10 key to confirm.

The program automatically presents the second area. Repeat the operations described above for the eight glass slides available on the disk.

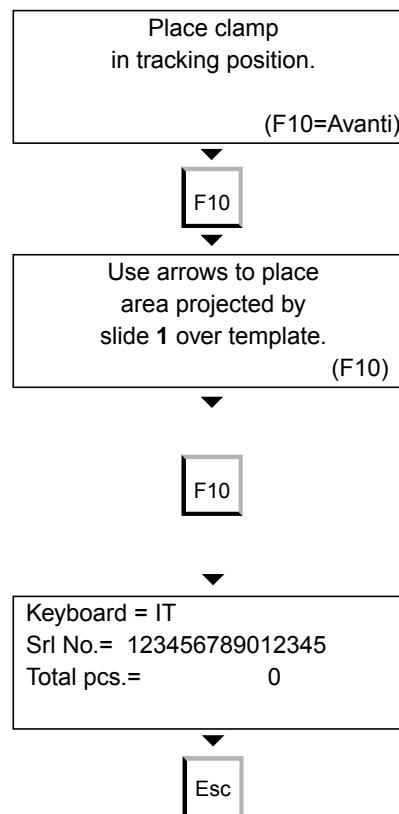
The software is designed to accept 16 different glass slides; after gauging No.8, therefore, press key F10 eight times to complete the procedure.

When the new disk containing the new marking areas is available, we recommend repeating the gauging operations for all the glass slides from No.1 to 16.

When the glass slides have been gauged, the position of each one is stored in the machine memory. In this way, when the gauging operations are repeated the co-ordinates of each glass slide are maintained.

At the end of the procedure the program saves all the set co-ordinates and returns to the following display:

Press ESC to return to the main menu.



## 8 TEST FUNCTIONS



### DIAGNOSTICS [F4]

In the event of faulty operation, check the different parts of the machine with the "Diagnostics" function.

If the TEST gives undesirable results, see chapter 9.1 "Trouble shooting" and, if necessary, contact the Silca Service Centre.

#### [F1] help



Press key F1 to gain access to the guide.



UP, DOWN:   arrow keys to scroll the TESTS.

F10: to select the test.

ESC: to exit from menu.

#### Test 100 = Motors

With the   keys movement for the X axis motor is activated.

With the   keys movement for the Y axis motor is activated.

**WARNING:** do not move the motors continuously against the mechanical end of run stops as with this function in operation all the limit switch sensors are disactivated.

#### Test 101 = Sensors

When the head is taken manually all the way to the limit switch on the Y axis (inwards on the machine) the display goes from ICY=OFF a ICY=ON.

When the head is taken to the limit switch on the X axis (to the left) the display goes from ICX=OFF a ICX=ON.

#### Test 102 = Clamp microswitch

Four boxes corresponding to the four clamp detection microswitches appear on the display. Press each microswitch in turn and check that the indicator on the display goes from [OFF] to [ON] in the relevant box.

Diagnostics  
100 = Motors  
101 = Sensors  
102 = Micro clamp

UP,DOWN,F10=Select

ESC=Exit

100 = Motors  
Use arrows to move  
axes.

101 = Sensors  
Move the axes  
towards the micro  
ICX=OFF ICY=ON

101 = Sensori  
Spingere gli assi  
verso i micro  
ICX=ON ICY=ON

102 = Micro clamp  
Press the clamp code  
micros  
[OFF] [OFF] [OFF] [OFF]

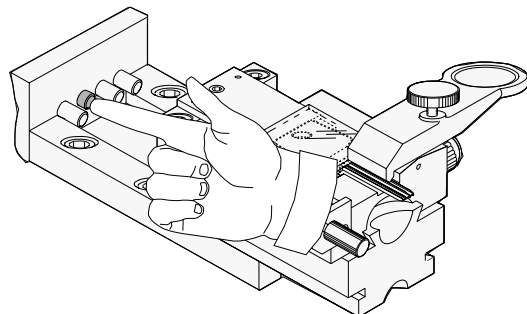


Fig. 29

102 = Micro clamp  
Press the clamp code  
micros  
[OFF] [ON] [OFF] [OFF]

**Test 103 = Magnet**

Take the clamp to the "tracking" position.  
When ENTER key on the keyboard is pressed an impulse is sent to the marking punch.

103 = Magnet  
Move point to free  
zone and press any  
key

**Test 104 = Laser**

Take the head all the way up to the end of run on the Y axis (inwards on the machine) and on the X axis (to the left).

The laser is turned on by holding down ENTER key on the keyboard.

To facilitate viewing the projection, place a piece of white paper over the clamp.

**If projection is not clearly visible, first check that the disk is properly positioned over the marking zone.**

104 = Laser  
Press any key and  
check emission

**Test 105 = Temperature**

This test gives an approximate indication of the temperature at the power point on the electronic control circuit board.

Normal temperature varies from 20°C to 50°C. If the reading goes beyond the safety limit (for correct operation of the circuit board) an alarm message is issued (ch.9.1 "Trouble shooting").

105 = Temperature  
  
24 (Max.90)

**Test 106 = Digital outlets**

Test foreseen for optional functions, not yet in use.

106 = Digital outlets

**Test 107 = Inlets 1**

Test foreseen for optional functions, not yet in use.

107 = Inlets 1

**Test 108 = Inlets 2**

Test foreseen for optional functions, not yet in use.

108 = Inlets 2

## 9 MAINTENANCE

**WARNING:** for repairs or replacement of parts for maintenance, the 'CE' mark is guaranteed only if original spare parts provided by the manufacturer are used.

Although the electronic marking machine MARKER 2000 does not require special maintenance, it is advisable to check and, if necessary, replace the parts subject to wear (belt, marking punch, etc.) and electrical/electronic parts (fuses, circuit boards, etc.) in the event of faulty operation.

Replacement is simple and can be carried out by the operator.

**WARNING:** for normal servicing of the burnished mechanical parts, we recommend using lubricants or protective oil, e.g. WD40 or similar. Do not apply to the parts used for electrical contact (clamps, gauging templates, etc.). Do not contaminate the electronic parts with the oil.

Before starting any type of maintenance (checks or replacements) read the instructions below:

- never carry out maintenance or servicing with the machine switched on
- always remove the mains plug
- follow all the instructions in the manual to the letter
- use original spare parts

### 9.1 Trouble shooting

FAULT	PROBABLE CAUSE
Machine on, no message on display. Check if the rear fan is working:	YES a) check display connection b) replace display (ch.9.6, page 40)
	NO a) check general fuses in power socket (ch.9.7, page 40) b) check fuses on electronic control circuit board (ch.9.7, page 40) c) replace electronic control circuit board (ch.9.8, page 42)
Working head not returning to the idle position	a) check fuse (F1) on control circuit board (when cut off, display shows the message: "CHECK FUSE F1" (ch.9.7, page 40)
	b) carry out a TEST 101 (ch.8, page 33) on the operation of the X and Y axis sensors
Working head not moving	a) check fuse F3 on electronic control circuit board (ch.9.7, page 40)
	b) check wiring between electronic control circuit board and motors
	c) replace electronic control circuit board (ch.9.8, page 42)
Keyboard not working	a) check wiring between electronic control circuit board and keyboard
	b) replace electronic control circuit board (ch.9.8, page 42)
	c) replace keyboard
Tracking laser not illuminating	a) check fuse F1 on electronic control circuit board (when cut off, display shows the message: "CHECK FUSE F1" (ch.9.7, page 40)
	b) check that the disk is inserted properly into the tracking block and that the clamp is not in the marking position
	c) check operation of safety microswitch on tracking unit (remove the unit and use an ohmmeter (ch.9.2, page 36)
	d) check wiring between electronic control circuit board and tracking unit
	e) carry out a TEST 102 (ch.8, page 33) on operation of clamp detector microswitch
	f) replace tracking unit (ch.9.2, page 36)
	g) replace electronic control circuit board (ch.9.8, page 42)
Marking punch not working	a) check fuse F3 on the electronic control circuit board (ch.9.7, page 40)
	b) check the wiring between electronic control circuit board and the magnet
	c) replace the magnet
	d) replace the electronic control circuit board (ch.9.8, page 42)
Message on display: <div style="border: 1px solid black; padding: 5px; width: fit-content;"> ALARM  Temperature is over  max. foreseen  Turn off Marker! </div>	check the operation of the cooling fan. If the fan is working properly, leave the machine off and contact a Silca Service Centre

FAULT	PROBABLE CAUSE
<b>Messaggio a display:</b> <div style="border: 1px solid black; padding: 5px; text-align: center;">CHECK FUSE F1</div>	<b>a)</b> if the fuse is not burnt out, replace the electronic control circuit board (ch.9.8, page 42) <b>b)</b> if the fuse is burnt out, replace and turn on the machine ● if the message remains (the fuse burns out again) replace the electronic control circuit board. ● if the message does not reappear and the machine is working properly, continue with the operations (the fuse burnt itself out to protect the machine from variations and interference in the mains electricity supply).
<b>Message on display:</b> <div style="border: 1px solid black; padding: 5px; text-align: center;">ALARM Short circuit</div>	<b>a)</b> disconnect the wire (7) from the control circuit board (page 44). Turn on the machine: ● if the message remains, replace the electronic control circuit board ● if the message disappears, replace the wire (7) (page 44)
<b>Message on display:</b> <div style="border: 1px solid black; padding: 5px; text-align: center;">ERROR Data saving</div>	<b>a)</b> replace the electronic control circuit board (ch.9.8, page 42)

The above-mentioned indications of probable causes of the faults described are purely indicative and do not represent a complete list of all possible causes of faulty operation.  
 If you are unable to trace the cause of a fault, contact the Silca Service Centre.

## 9.2 Replacing the tracking unit

- 1) turn off the master switch and remove the plug.
- 2) disconnect the two connectors (S1) (fig. 30) and remove the two front screws (D3).
- 3) take hold of the whole unit (D) turn slightly downwards and remove.
- 4) remove screw (D4) and disconnect the yellow/green wire.
- 5) replace the tracking unit and re-connect the yellow/green wire with the screw (D4).
- 6) fit the unit into its seating, taking care that the two wires (S2) are properly housed in the special groove.
- 7) replace the two front screws (D3) and re-connect to the two connectors (S1).

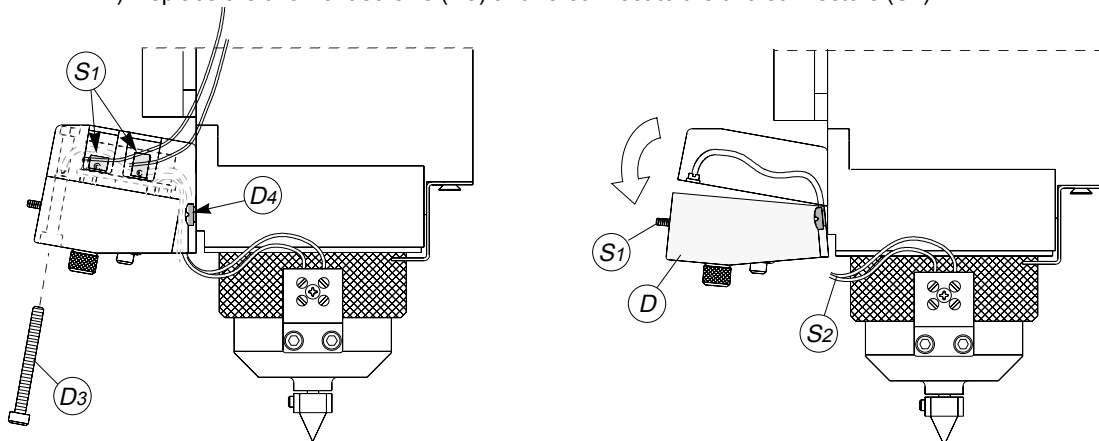


Fig. 30

## 9.3 Replacing the marking punch

- 1) turn off the master switch and remove the plug.
- 2) remove the grub screw (A1) (fig. 31).
- 3) remove the worn punch and fit the new one, pushing all the way in.
- 4) tighten the grub screw (A1).

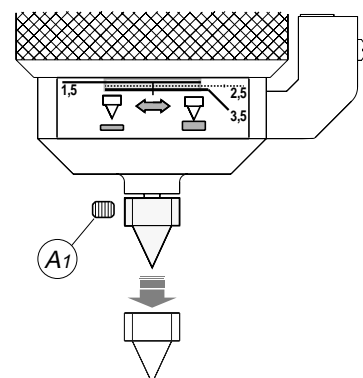


Fig. 31



## 9.4 Removing the upper cover

To gain access to some parts of the machine for maintenance purposes (e.g. belt tension-replacement, display replacement) the top cover (Q) must be removed. Proceed as follows.

- 1) turn off the machine and remove the plug.
- 2) remove the four screws (Q1) securing the cover to the machine.
- 3) slightly raise the rear of the cover and very carefully pull forward, releasing it from the front catches (fig. 33).
- 4) disconnect the connector (B1) and faston (B2) from the display.

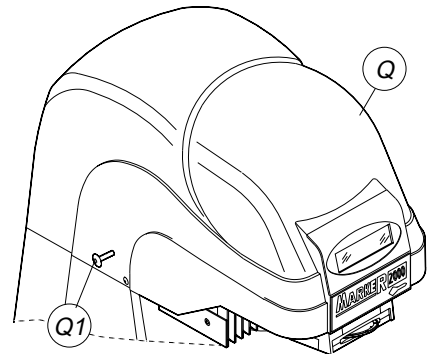


Fig. 32

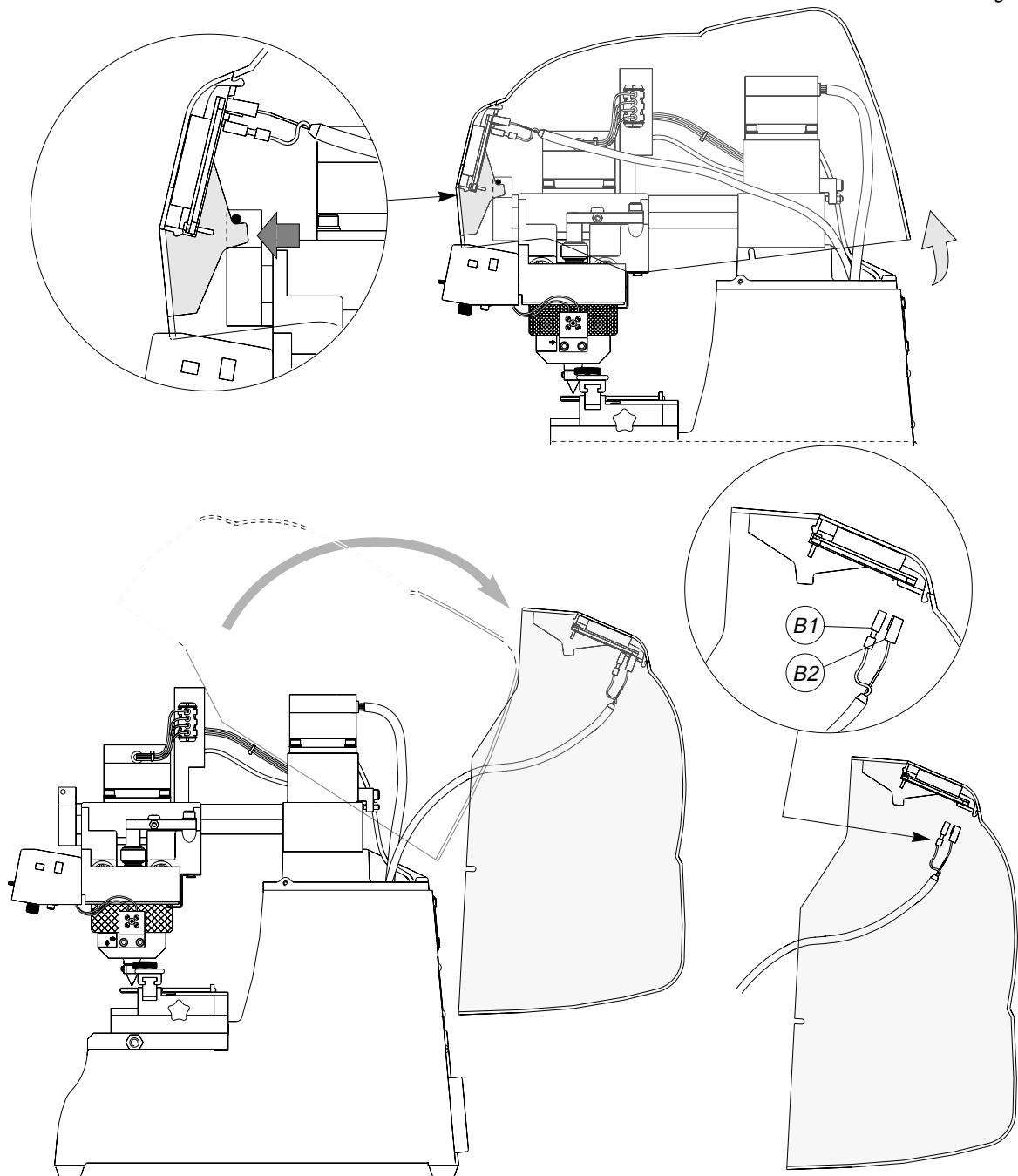


Fig. 33

## 9.5 Replacing the belts and adjusting tension

If the top of the machine begins to vibrate, check the condition and tension of the belts, as follows:

- 1) turn off the master switch and remove the plug.
- 2) remove the upper cover (ch.9.4) and place next to the machine, without disconnecting the wiring to the display.

### **Adjusting tension on the Y axis belt**

- 3) loosen the screws (T) securing the motor support, loosen the nut (Z1) and adjust the belt-tightening pulley (Z).

### **Adjusting tension on the X axis belt**

- 4) loosen the nut (R1) and adjust the belt-tightening pulley (R).

### **REPLACING THE Y AXIS BELT**

- 1) turn off the master switch and remove the plug.
- 2) remove the upper cover (ch.9.4) and place next to the machine, without disconnecting the wiring to the display.
- 3) remove the screw (V) and block (V1).
- 4) loosen the belt-tightening pulley (Z) and remove the belt.
- 5) remove the two screws (T) securing the Y axis motor support and remove the whole unit (motor and support).
- 6) place the new belt in position and replace the motor unit, taking care that the pulley is housed on the inside of the belt. Do not tighten the screws (T) fully.
- 7) replace block (V) and screw (V1).
- 8) adjust belt tension by screwing the belt-tightening pulley (Z) then tighten the motor securing screws (T) all the way.
- 9) replace the upper cover (Q).

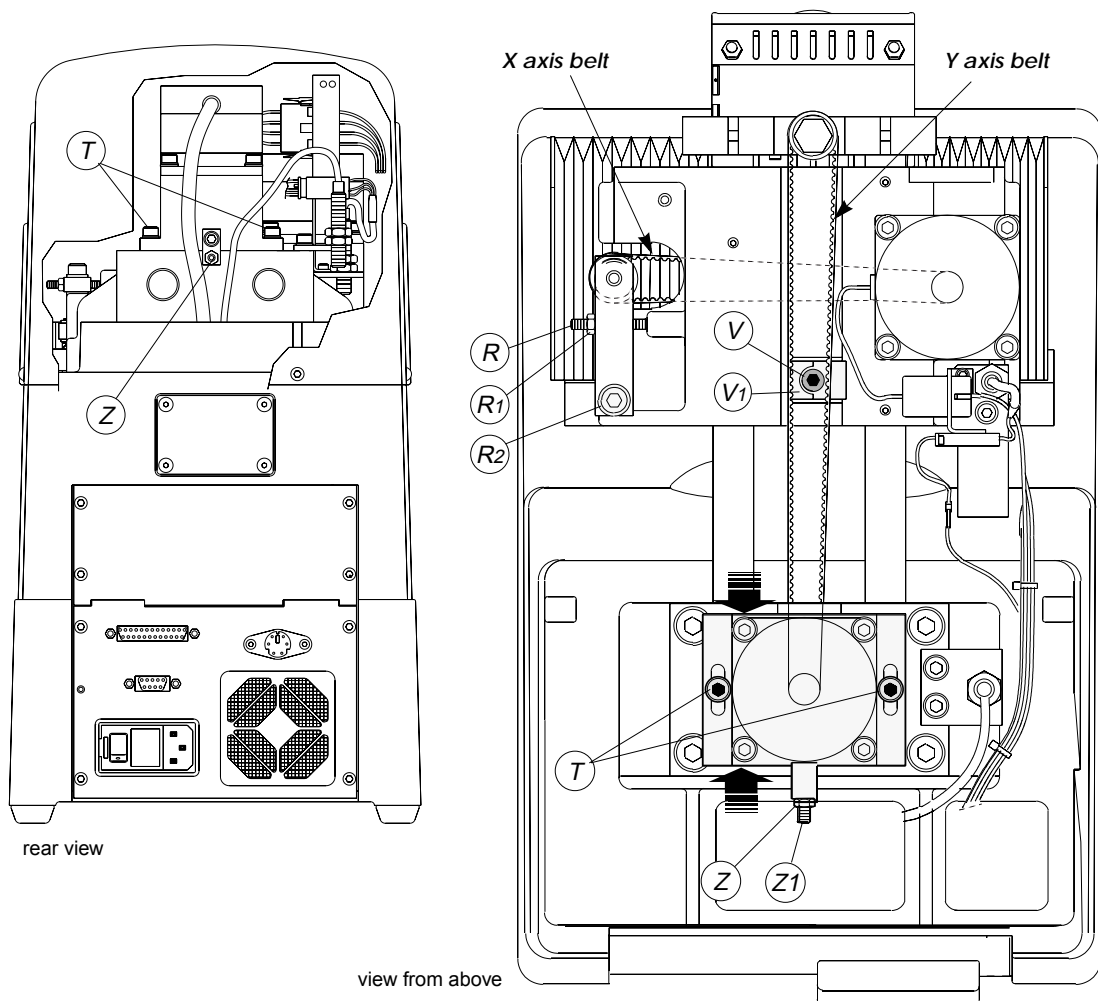


Fig. 34

**REPLACING THE X AXIS BELT**

- 1) turn off the master switch and remove the plug.
- 2) remove the upper cover (ch.9.4) and place next to the machine, without disconnecting the wiring to the display.
- 3) remove the clamp (C1) (fig. 35).
- 4) disconnect the two connectors (S1) on the tracking unit.
- 5) remove the four screws (S) securing the bellows (fig. 36).
- 6) loosen screw (R2), the nut (R1) and the belt pulley (R).
- 7) loosen the two grub screws (R3) and remove the two bars (S3) holding the working head with one hand.
- 8) loosen screw (K) until the belt is free (fig. 36).
- 9) place the new belt in position and re-assemble the head, ensuring that the belt (X) is placed on the outside of the pulleys (W) and (W1).
- 10) replace the parts in reverse order.
- 11) adjust belt tension by means of the belt tightening pulley (R).

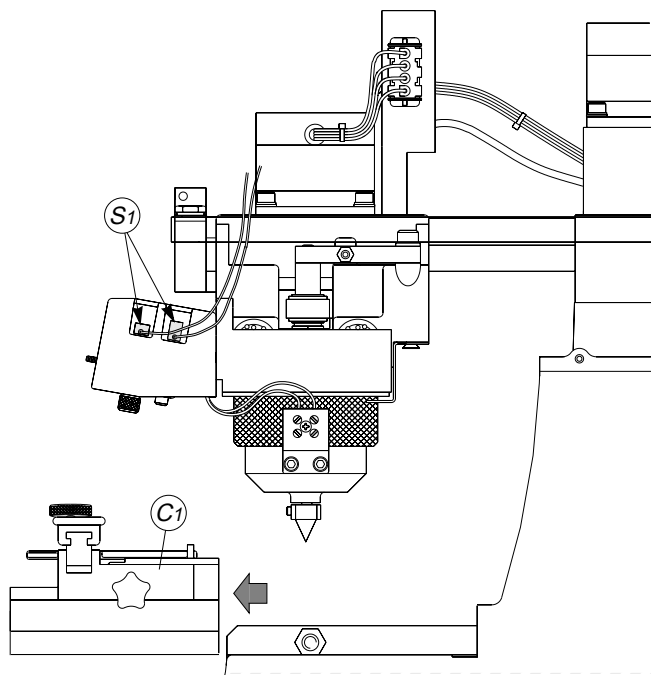


Fig. 35

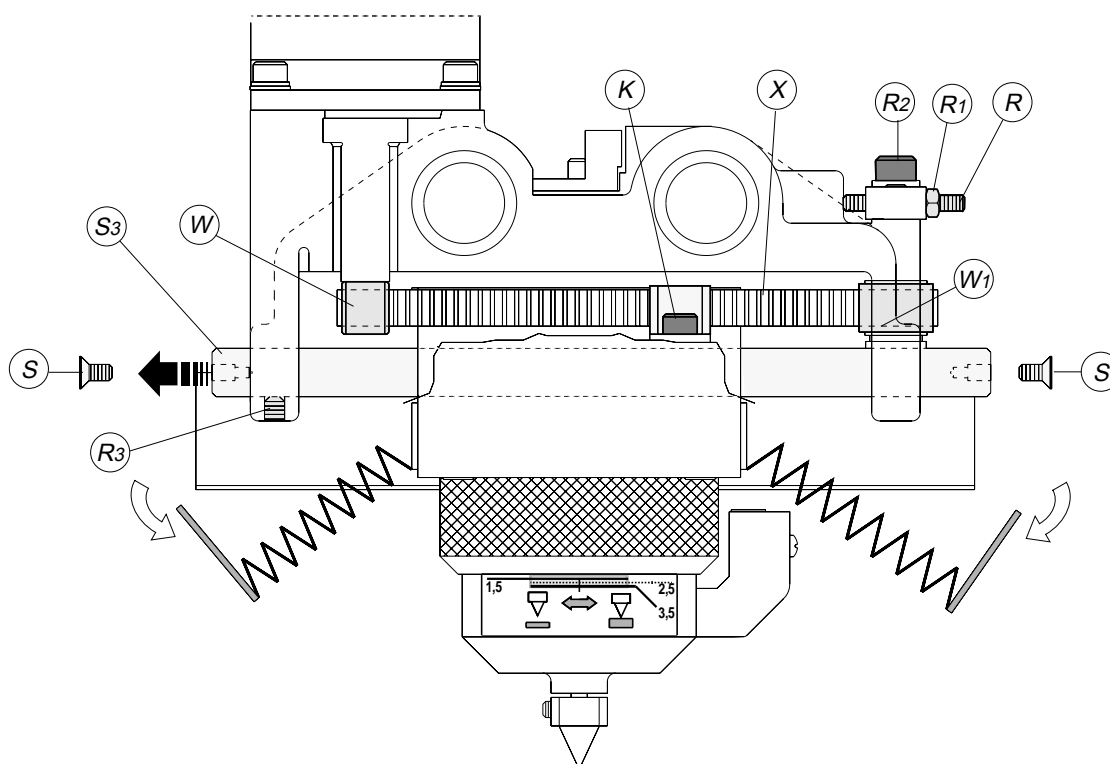


Fig. 36

## 9.6 Replacing the display

- 1) turn off the master switch and remove the plug.
- 2) raise and remove the top cover (Q) (ch.9.4), disconnect the connector (B1) and faston (B2) from the display.
- 3) take hold of the mask (J) and remove, exerting leverage on the top of it (fig. 37).
- 4) remove the four screws (B3) securing the display, spacer and plate.
- 5) replace the display taking care to position the spacer and plate properly.
- 6) re-connect the faston (B2) and connector (B1), replace the cover (Q) on the machine and secure with the four screws (Q1).

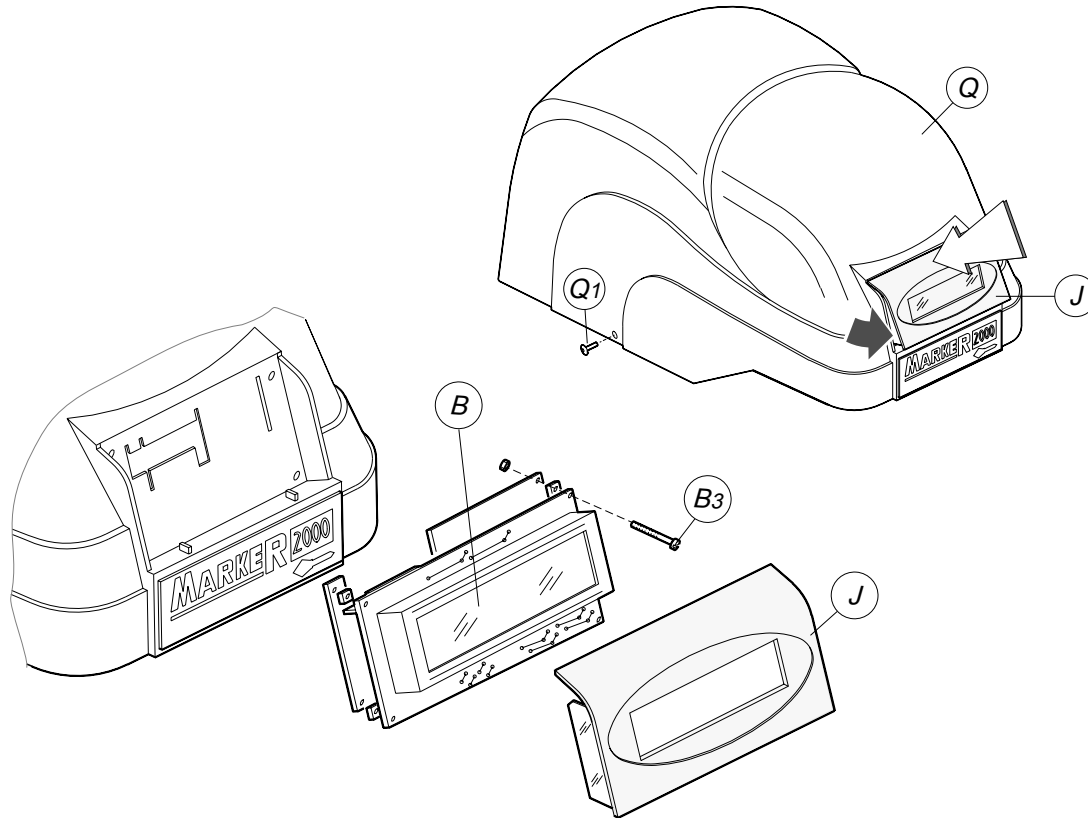


Fig. 37

## 9.7 Checking and replacing fuses

Fuses should be checked with an instrument for measuring their continuity (tester, ohmmeter, multimeter, etc.) as they may appear to be good condition to the naked eye even when they are electrically faulty. Fuses must always be replaced with others of same type (rapid or delayed) and with the same amps, as given in the manual.

There are five fuses in the MARKER 2000.

- **2 fuses:**

**3.15 Amps rapid (220V)**

**4 Amps rapid (110V)**

situated in the power socket on the back of the machine, next to the switch (I) (fig. 38). They protect the machine from the power variations and short circuits.

To check and replace, if necessary, proceed as follows:

- 1) turn off the master switch and remove the plug.
- 2) use a screwdriver to open the flap covering the socket, remove the fuses and replace, if necessary.

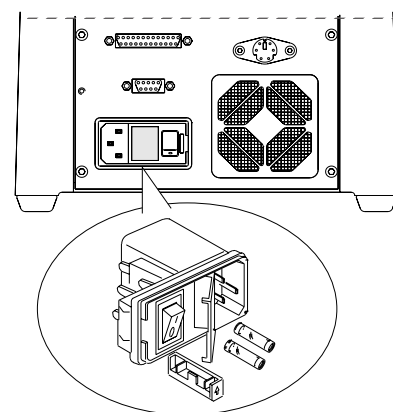


Fig. 38

- **3 fuses: F1, F2 and F3**

**F1 = 1 Amps delayed**

protects the +24Vdc for all input/output signals and laser tracking.

**F2 = 2 Amps delayed**

protects the +5Vdc required for operation of the microprocessor.

**F3 = 4 Amps delayed**

protects the +34Vdc for the step motor and magnet.

situated on the electronic board housed in the base. They protect the board from short circuits. Proceed as follows:

- 1) turn off the master switch and disconnect all the wiring to the machine.
- 2) turn the machine on its back and remove the four screws (U1) securing the bottom plate (U), which can then be taken off (fig. 39).
- 3) check and, if necessary, replace the fuses, as follows:

**to remove the fuse:**

exert finger pressure on the fuse and turn anticlockwise (fig. 40).

**to fit the new fuse:**

take care to position the fuse properly, then push in and turn clockwise.

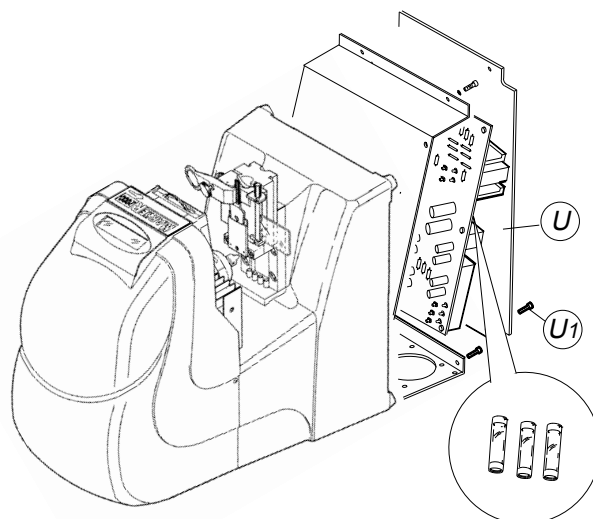


Fig. 39

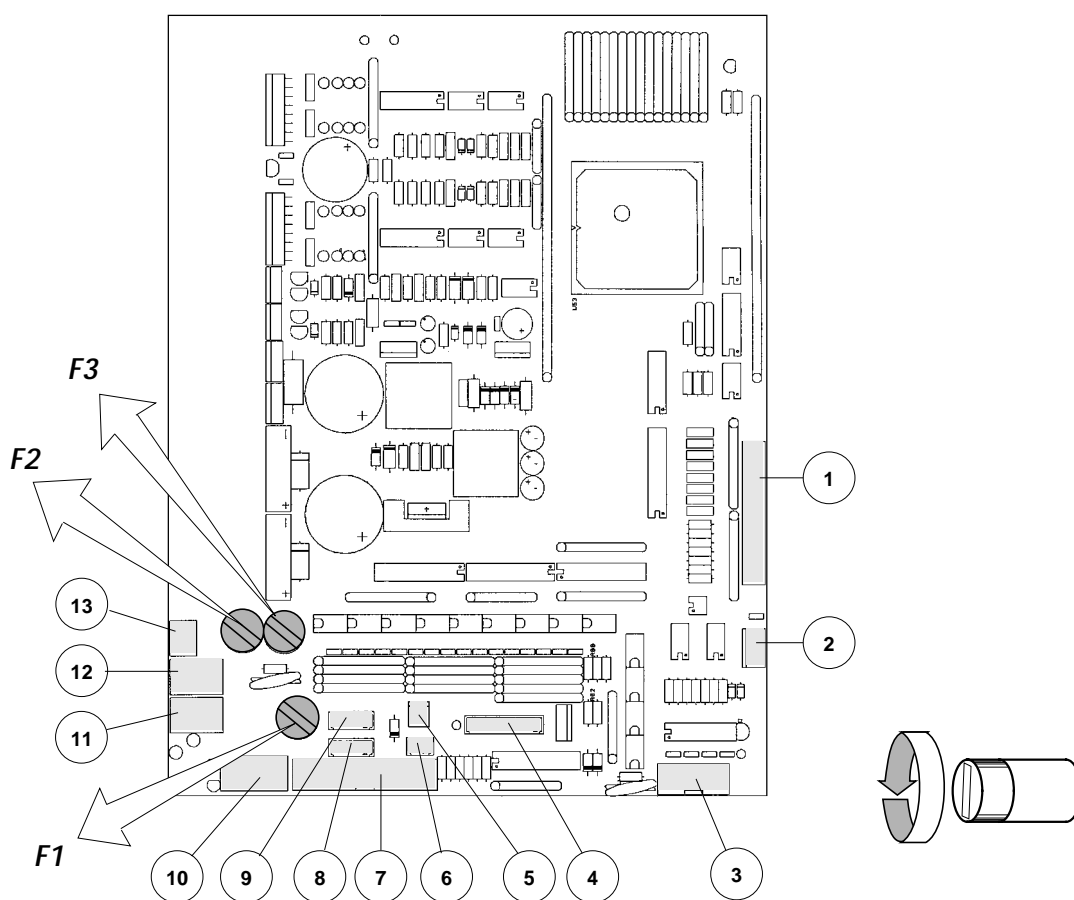


Fig. 40

## 9.8 Replacing the control circuit board

- 1) turn off the master switch and disconnect all the wiring to the machine.
- 2) turn the machine on its back and remove the four screws (U1) securing the bottom plate (U), which can then be taken off (fig. 39).
- 3) disconnect all the connectors on the board (from 1 to 13, page 44).
- 4) with the special tool (U2) provided with the replacement board (fig. 41), release the five clips on the board.
- 5) fit the new board, engaging with the special catches, and connect all the connectors, taking care not to exchange the two connectors "10" and "11". The other connectors are polarized and therefore cannot be interchanged or fitted wrongly.

**WARNING:** after replacing the board, check that all parts of the machine are working properly, using the **TEST** function (ch.8, page 33).

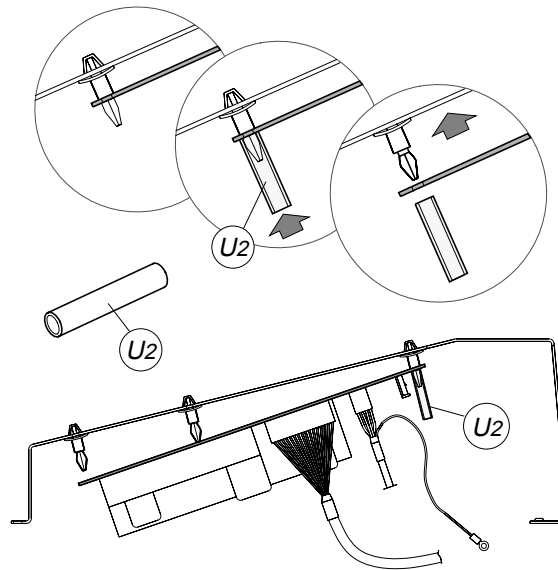


Fig. 41

## 9.9 Replacing and positioning the sensors

### *Replacing the Y axis sensor*

- 1) turn off the master switch and remove the plug.
- 2) turn the machine onto its back, remove the four screws securing the bottom plate (U) and remove (fig. 39).
- 3) disconnect the Y sensor connector (9) (page 44).
- 4) stand the machine upright again, remove the cover (Q) (ch.9.4) and place next to the machine, without disconnecting the display connector.
- 5) loosen the nut (Y4), unscrew the sensor from the plate (Y1) and remove (fig. 42).
- 6) place the new sensor in position and screw down until it almost contacts the plate (X1) (maintain a distance of approximately 0,4 mm) and secure with the nut (Y4).
- 7) guide the Y sensor wire into the machine, then turn it on its back again.
- 8) connect the Y sensor connector (9) (page 44) to the electronic circuit board.
- 9) replace the bottom plate (U) and stand the machine upright.
- 10) connect the marking machine and proceed with "SETTING the ZEROES" (ch.7).

**Replacing the X axis sensor**

- 1) turn off the master switch and remove the plug.
- 2) remove the cover (Q) (ch.9.4) and place next to the machine, without disconnecting the display connector.
- 3) disconnect the connector (X3) (fig. 42) (cut the wire tie securing it to the metal plate).
- 4) loosen nut (X4), unscrew the sensor and remove.
- 5) place the new sensor in position and screw down until it almost contacts the plate (maintain a distance of approximately 0,4 mm) and secure with the nut (X4).
- 6) connect the X sensor connector (8) to the wire and secure to the metal plate with a wire tie.
- 7) connect the marking machine and proceed with "SETTING THE ZEROES" (ch.7).

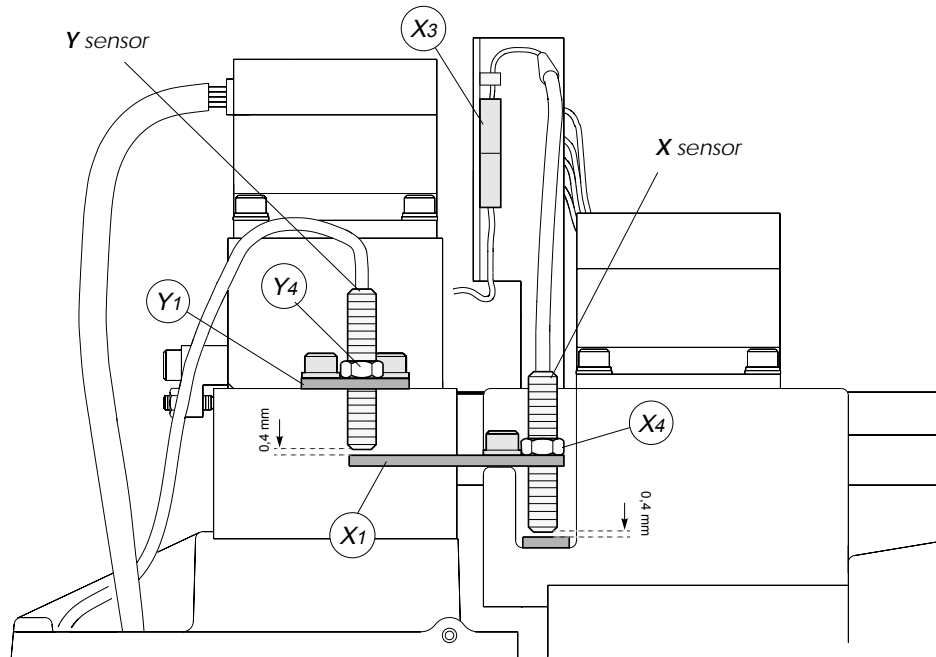
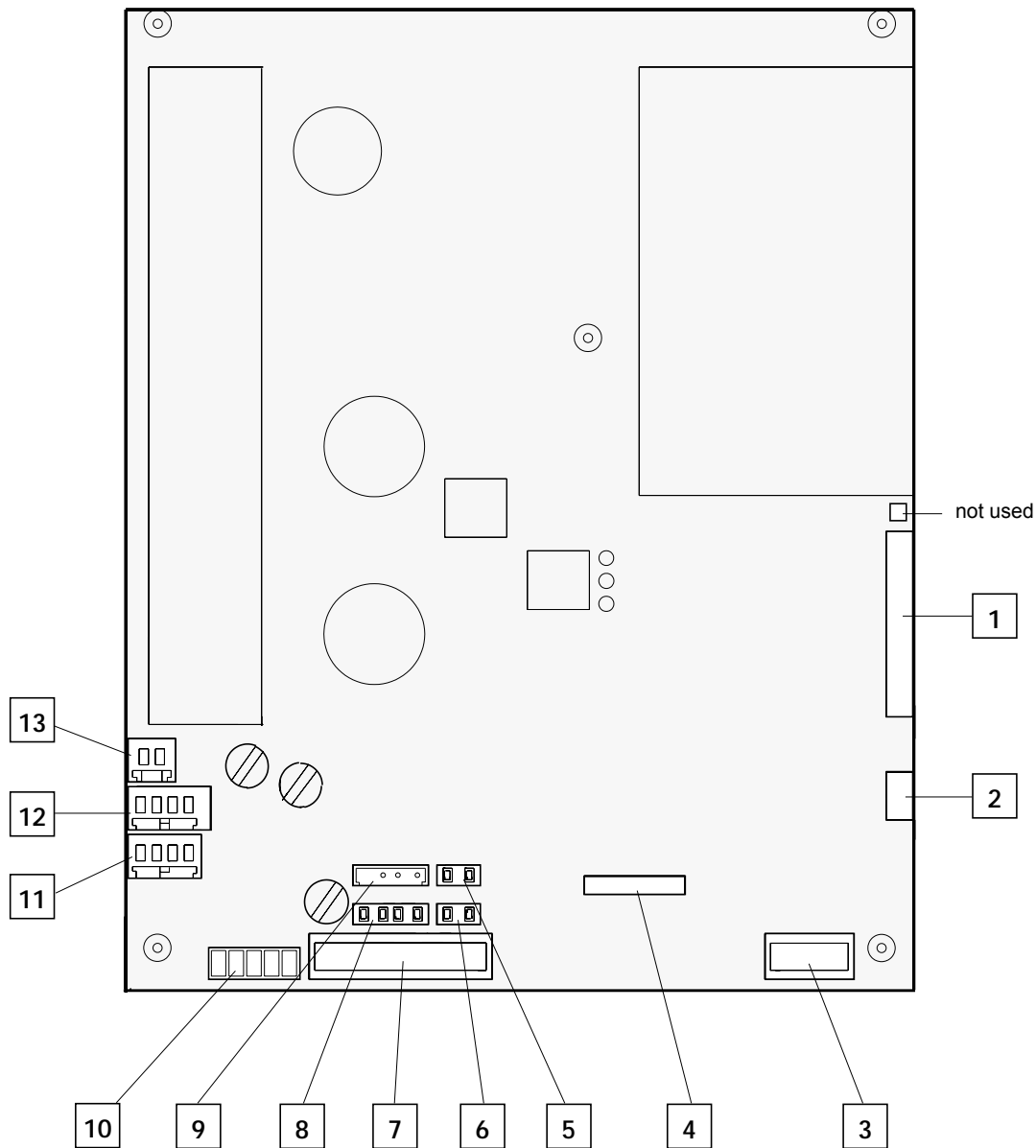


Fig. 42

## 10 ELECTRICAL DIAGRAMS

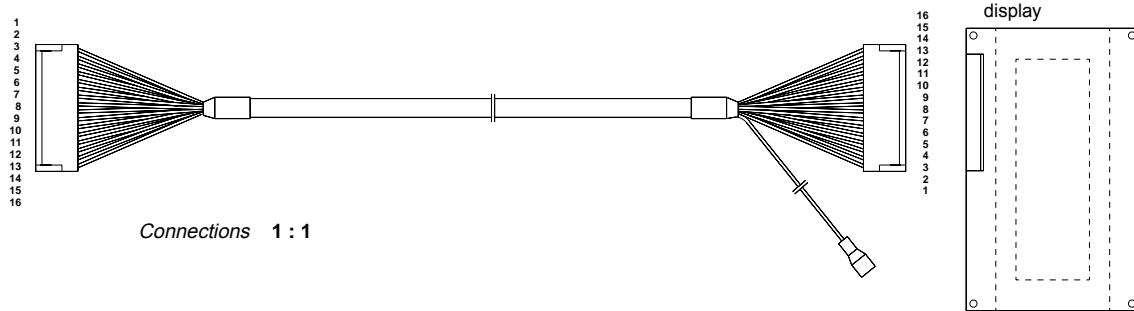
### ELECTRONIC CONTROL CIRCUIT BOARD



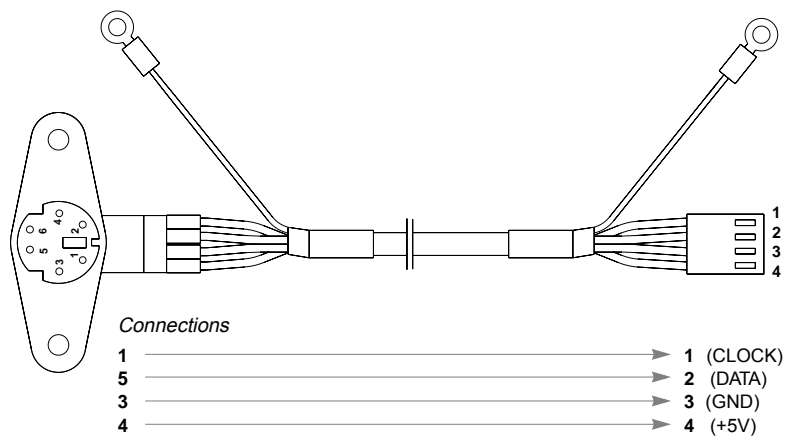
- |  |                                       |
|--|---------------------------------------|
| <b>1</b> display connector                     | <b>8</b> X axis sensor connector      |
| <b>2</b> keyboard connector                    | <b>9</b> Y axis sensor connector      |
| <b>3</b> serial connector RS 232 computer      | <b>10</b> power transformer connector |
| <b>4</b> clamp detection microswitch connector | <b>11</b> X axis motor connector      |
| <b>5</b> tracking laser control connector      | <b>12</b> Y axis motor connector      |
| <b>6</b> ventilator connector                  | <b>13</b> magnet control connector    |
| <b>7</b> inlet-outlet connector                |                                       |



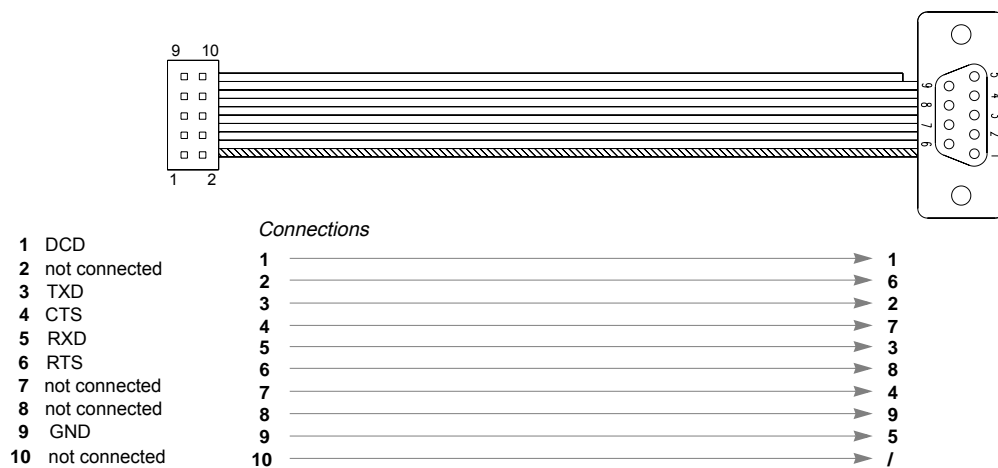
## 1 display connector



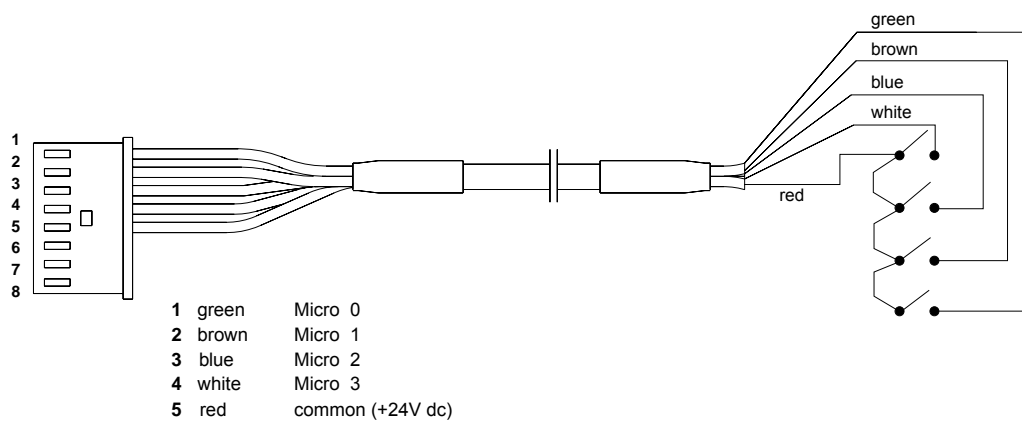
## 2 keyboard connector



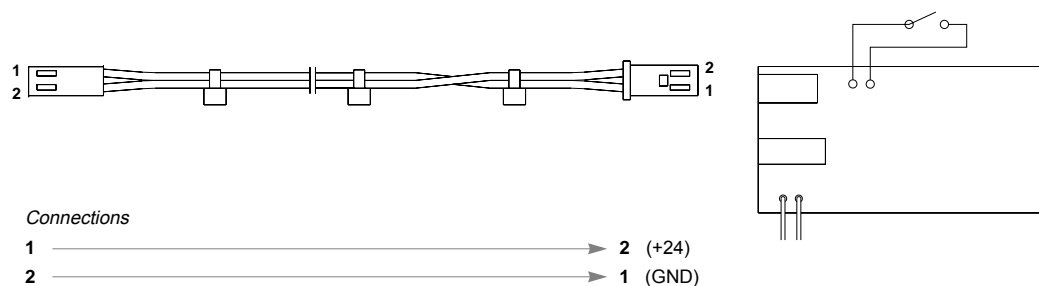
## 3 serial connector RS 232 computer



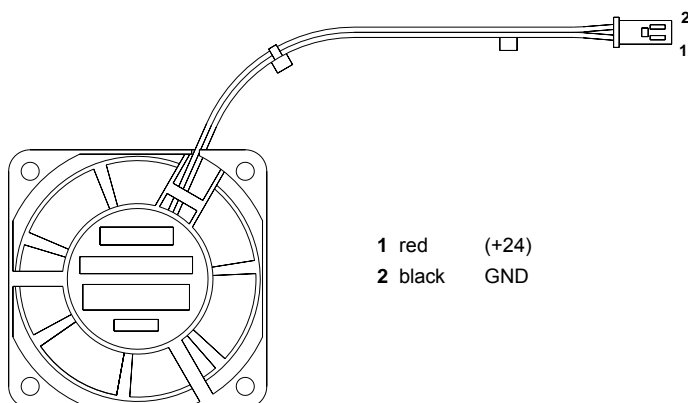
#### 4 clamp detection microswitch connector



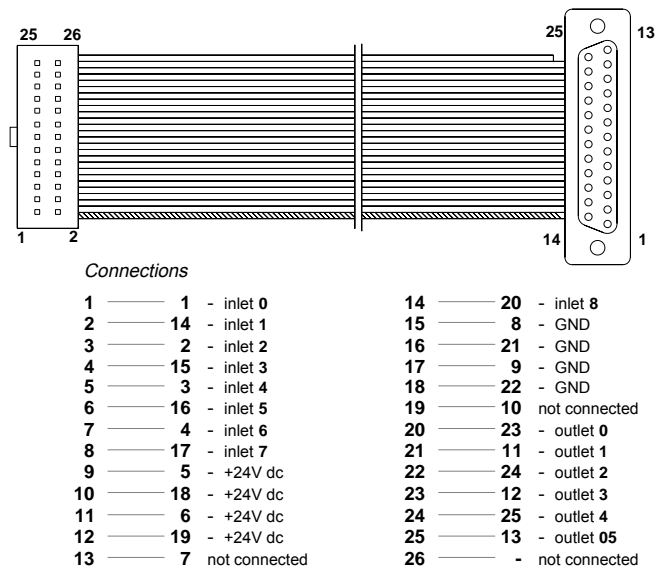
#### 5 tracking laser control connector



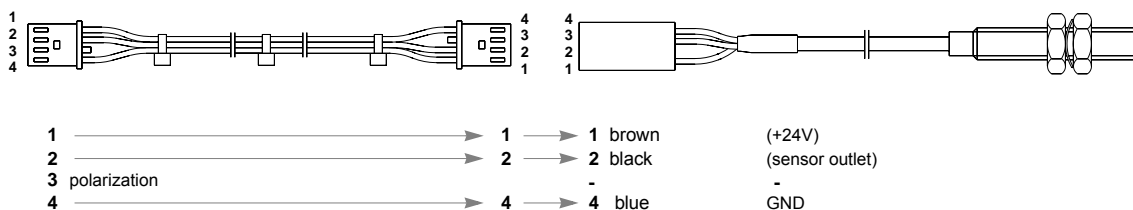
#### 6 ventilator connector



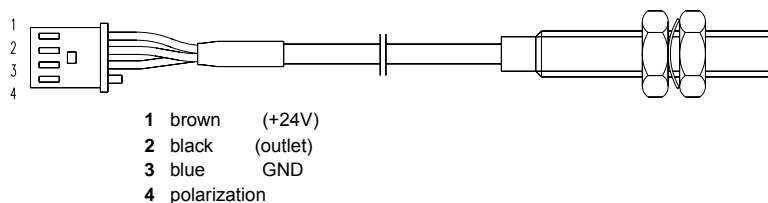
## 7 inlet-outlet connector



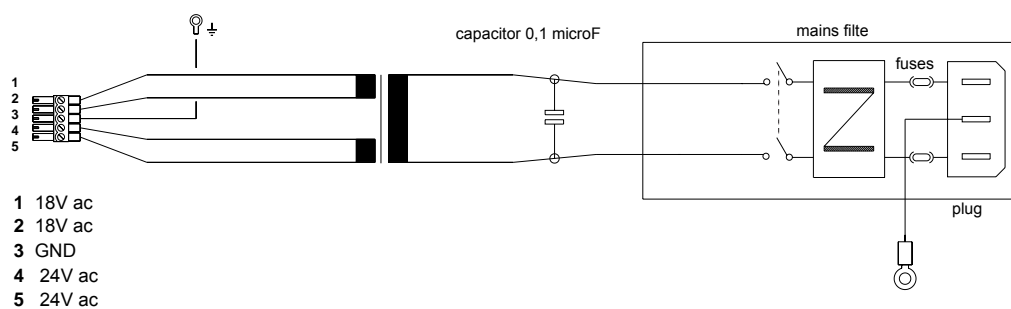
## 8 X axis sensor connector



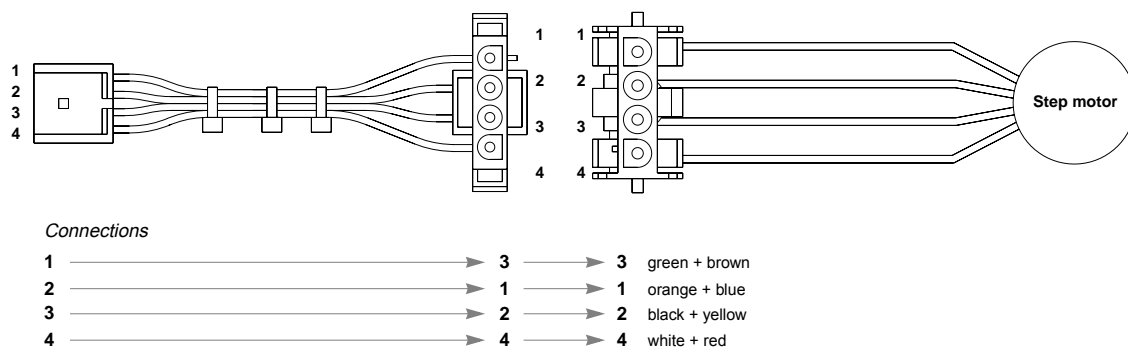
## 9 Y axis sensor connector



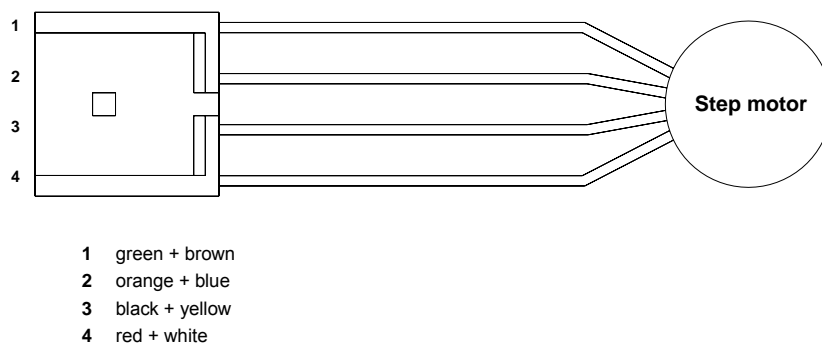
## 10 power transformer connector



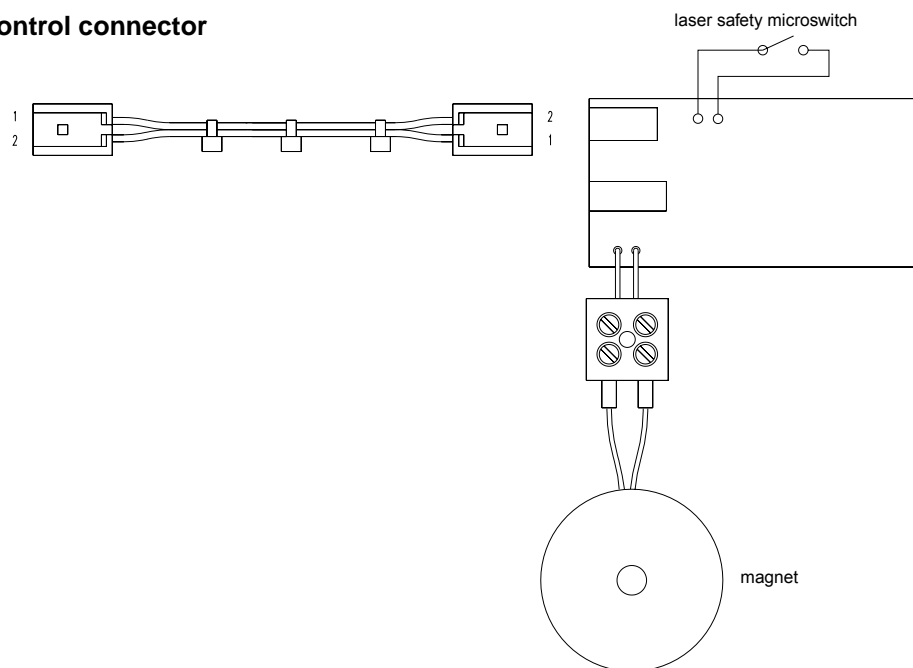
# 11 X axis motor connector



# 12 Y axis motor connector



# 13 magnet control connector



## 11 DISPOSAL

For correct disposal please refer to current standards.

### INFORMATION FOR USERS OF PROFESSIONAL EQUIPMENT



#### From "Actuation of Directive 2012/19/EU regarding Waste Electrical and Electronic Equipment (WEEE)"

The symbol of a crossed waste bin found on equipment or its packing indicates that at the end of the product's useful life it must be collected separately from other waste so that it can be properly treated and recycled.

In particular, separate collection of this professional equipment when no longer in use is organised and managed:

- a) directly by the user when the equipment was placed on the market before 31 December 2010 and the user personally decides to eliminate it without replacing it with new equivalent equipment designed for the same use;
- b) by the manufacturer, that is to say the subject which was the first to introduce and market new equipment that replaces previous equipment, when the user decides to eliminate equipment placed on the market before 31 December 2010 at the end of its useful life and replace it with an equivalent product designed for the same use. In this latter case the user may ask the manufacturer to collect the existing equipment;
- c) by the manufacturer, that is to say the subject which was the first to introduce and market new equipment that replaces previous equipment, if it was placed on the market after 31 December 2010;

Suitable separate collection for the purpose of forwarding discarded equipment for recycling, treatment or disposal in an environmentally friendly way helps to avoid possible negative effects on the environment and human health and encourages re-use and/or recycling of the materials making up the equipment.

The sanctions currently provided for by law shall apply to users who dispose of products in unauthorised ways.

## **12 ASSISTANCE**

Silca provides full assistance to purchasers of the MARKER 2000 machine. To ensure complete safety for the operator and machine, any job not specified in this manual should be carried out by the manufacturer or in the special Service Centres recommended by Silca.

On the back cover of this manual is a list of the manufacturer's addresses: the addresses of specialized Service Centres are on the next page.

### **12.1 How to request service**

The guarantee attached to the MARKER 2000 ensures free repairs or replacements of faulty parts within 24 months of purchase. All other service calls must be arranged by the customer with Silca or with a Silca Service Centre.



VITTORIO VENETO 24/03/2011

## CE DECLARATION OF MACHINE COMPLIANCE

**SILCA S.p.A. - VIA PODGORA 20 ( Z.I.)**  
**31029 VITTORIO VENETO (TV) - (ITALY)**  
**TEL. 0438 9136 - FAX. 0438 913800**

Declares under its own responsibility that the **Marking Machine** model

### MARKER 2000

complies with the requirements of the following European Directives:

European Union **DIRECTIVE 2006/42/CE** (Machines)  
and with the EN 292/1 – EN 292/2 Standards

European Union **DIRECTIVE 2004/108/CE** (Electromagnetic Compatibility)  
and with the EN 55022 / IEC 801 – 4 / IEC 801 – 2 Standards

European Union **DIRECTIVE 2006/95/CE** (Low Voltage)  
and with the EN 60204-1 / EN 60950 Standards

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Claudio Tomasella of the Silca S.p.A. Research & Development Division is authorized to create a Technical File.

General Manager Basic Production Center

**Stefano Setti**

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