CEDAL EQUIPMENT®

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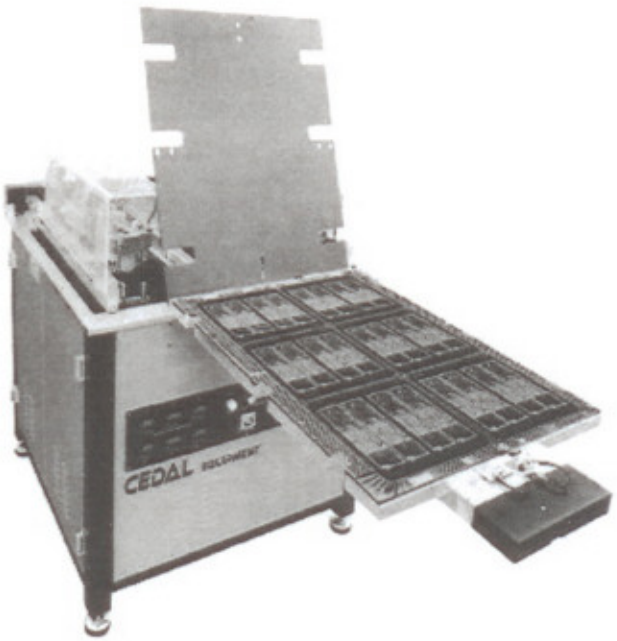
R.B.M. 66s



Operations manual

Ed. January 2005

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2.1 TECHNICAL FEATURES

2.1.1 Max overall dimensions

- Width 1050 mm (41.3")
- Length 1900 mm (74.8")
- Height 1180 ÷ 1250 mm (46.4" ÷ 49.2")

2.1.2 Height of working table

- 1000 ÷ 1070 mm (39.4")

2.1.3 Layer size

- Width 280 ÷ 650 mm (11" ÷ 25")
- Length 370 ÷ 720 mm (14.6" ÷ 28.3")

2.1.4 Bonding Surface Points

- Six pairs ø 6mm (0.24")
- Max temperature 300°C (572°F)
- Max pressure each 15 Kg/cm^2

2.1.5 Electrical Requirements

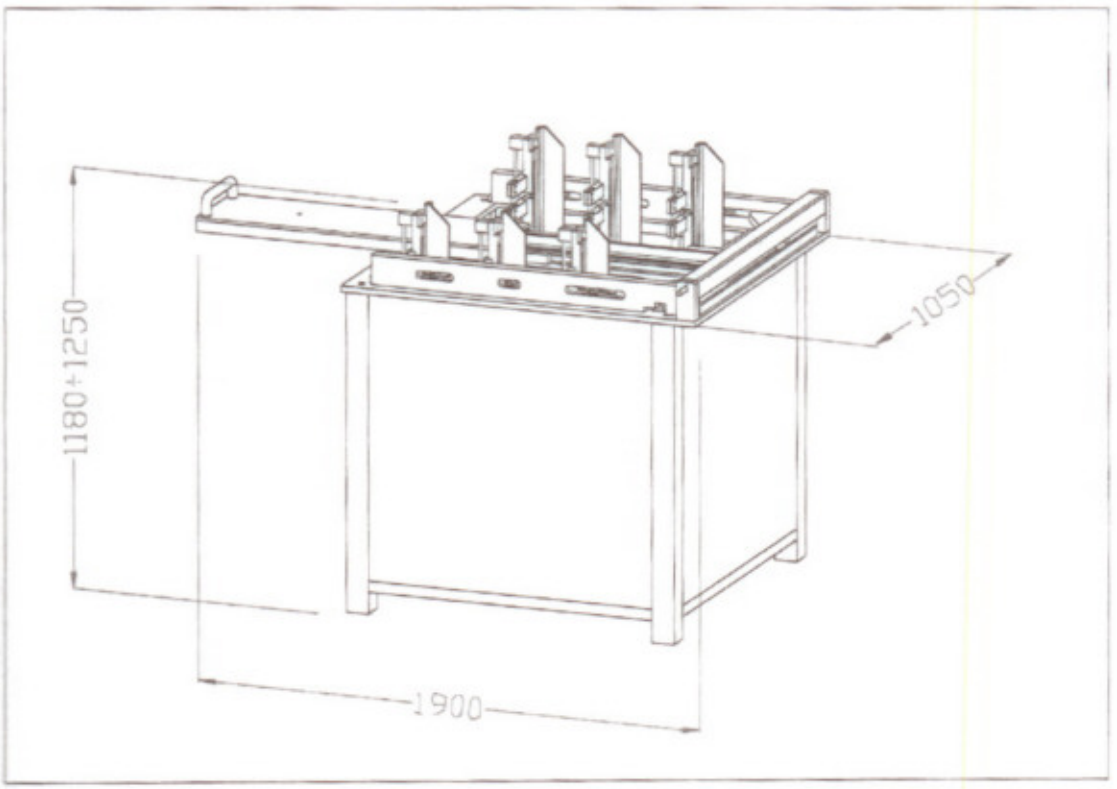
- Power Supply 1 phase 50/60 Hz + Ground
- Max power consumption 2 KVA
- Standard Voltage 220V

2.1.6 Pneumatic Requirements

- Consumption 0.02 NL/min.
- Pressure 6 bar

2.1.7 Weight

- Gross Weight 370 Kg (1,121 lbs.)
- Net Weight 260 Kg (787 lbs.)



Overall dimensions

2.2 GENERAL DESCRIPTION

The Registration Bonding Machine mod. RBM 66S, is designed for making the coupling and bonding of the various layers to be processed in the Adara hot press. It uses a template where the layers are held in position by pins. The layers will be stuck together by six pairs of hot welder heads which act like pliers to grip the layers and fuse the resin in small peripheral areas of pre-preg while they are pressing.

2.3 FEATURES

The RBM 66S is composed of two sections : the first section where the template is moved out by the operator for layers and pre-preg loading; the second one where the material book is stuck by the 6 hot pliers.
The welder temperature is settable by each temperature controller. The bonding time can be adjusted by a timer, while a pressure regulator sets the pliers pressure on the layers. These three parameters are to be adjusted according to the layers and pre-pregs performances.

2.4 MACHINE IDENTIFICATION

The serial number of the machine is punched on a plate fixed to the frame in the back of the machine. It must be always indicated when requesting technical services or ordering spare parts.

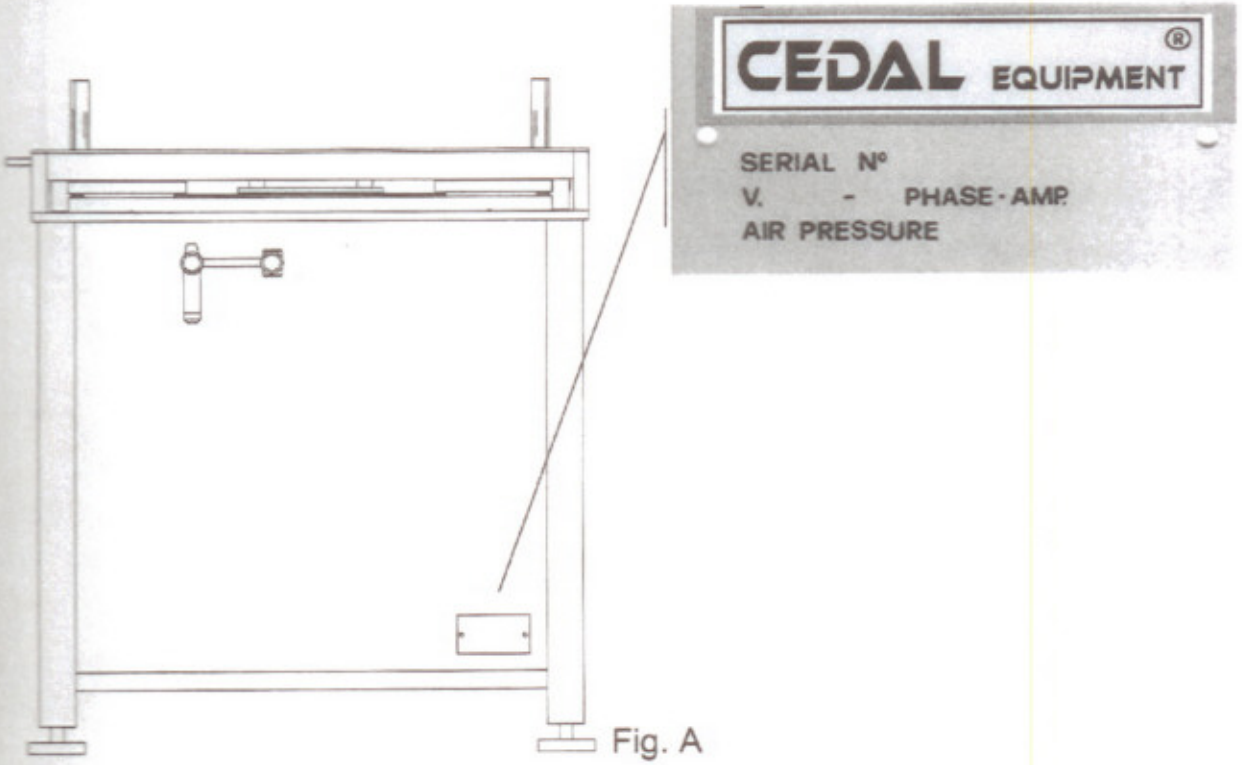
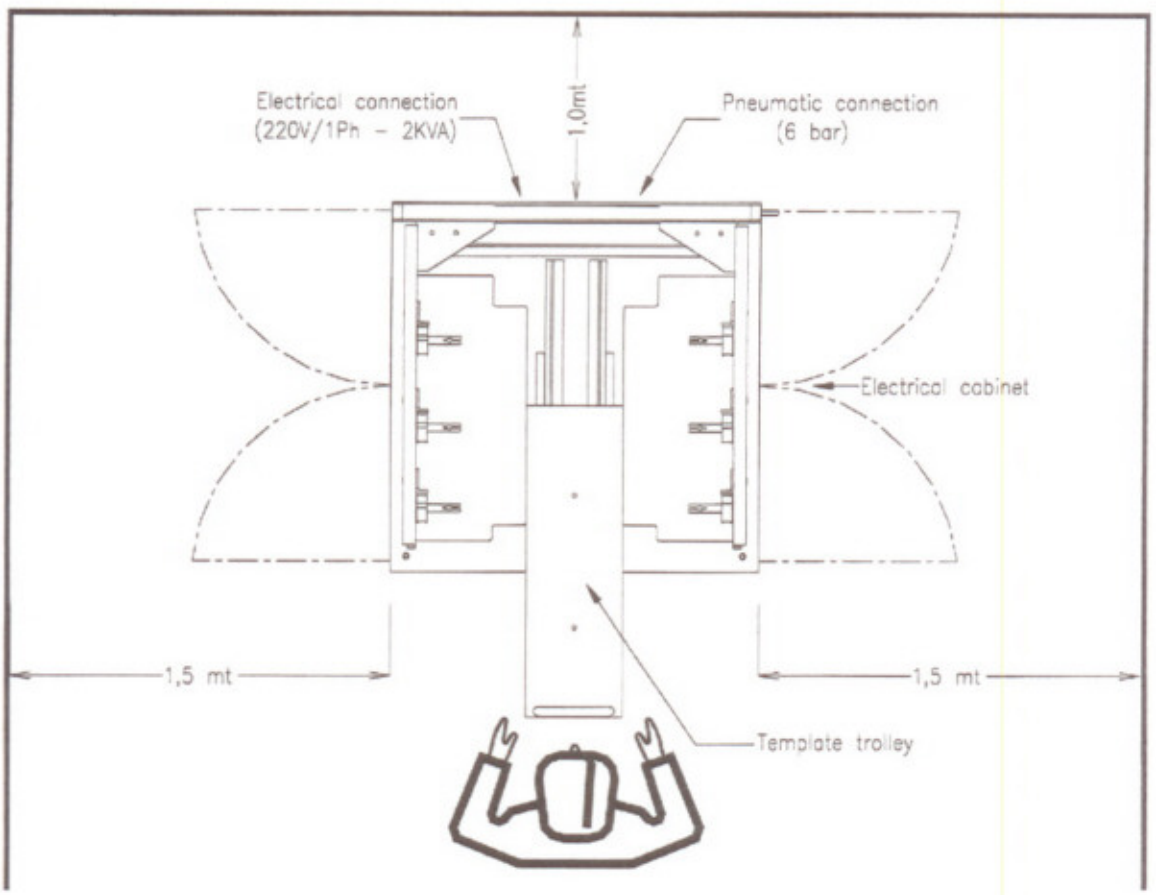


Fig. A

2.5 PRELIMINARY CHECKS AND INSTALLATION

2.5.1 Machine Positioning

For a correct use of the RBM 66S it is necessary that the machine is positioned in strict compliance with the measurements given in Fig. B. These measurements indicate the minimum space required by the operator to carry out works and/or servicing operations in correct sequence.



Installation plan view

Fig. B

2.5.2 Machine Leveling

Since the machine has a movable carriage for the template, it requires a sufficient space to allow the operator to work easily when the template is outside the machine.
To adjust the working level it needs to play on the 4 leveling feet.

Fig. C

2.5.3 Electrical Connection

The RBM 66S is designed for a standard voltage of 220 V 1 phase + GND. Different voltage can be adapted upon customer's request.
Before connecting the main electricity, it requires to check that the electrical power supply is conformed with the specifications of the machine (voltage, power).

2.5.4 Pneumatic Connection

The pneumatic connection to the machine is indicated in Fig. B.

To complete the pneumatic connection, connect a proper hose with a minimum inner diameter of 8mm and an external diameter of 10 mm to where indicated as pneumatic connection in the Fig. B. The RBM 66S needs dry air pressure of 6 bar. Lubricated air cannot be used therefore.

2.5.5 Template Installation

The RBM 66S is supplied with the template already installed on. In case of changing a template or at installation of template , it needs to be fixed by two Allen screws (ref. A of Fig. D). Then connect the two pneumatic pipes (ref. B of Fig. D).

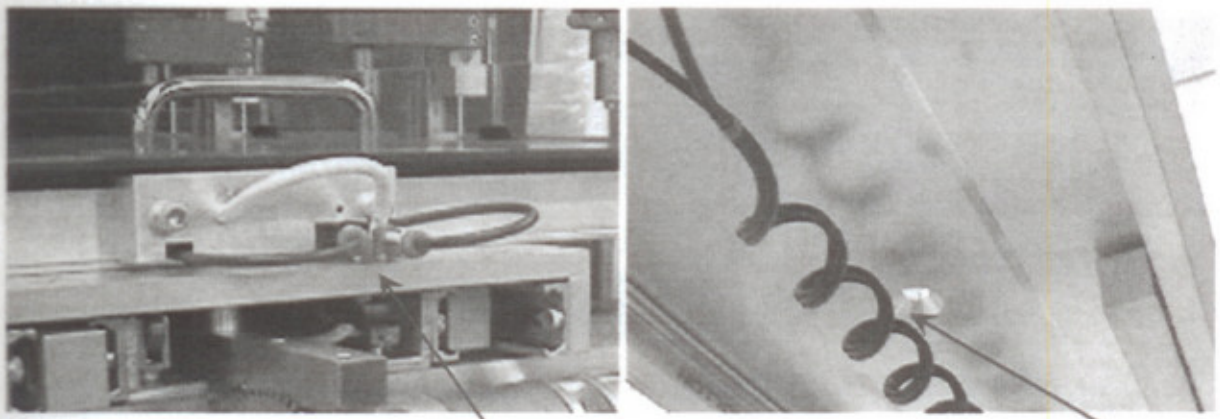


Fig. D

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3.1 CONTROL PANEL AND MACHINE CONTROLS (REF. TO FIG. E)

This paragraph gives the instructions on correct use of the components of the central panel of RBM 66S and other controls of the machine.

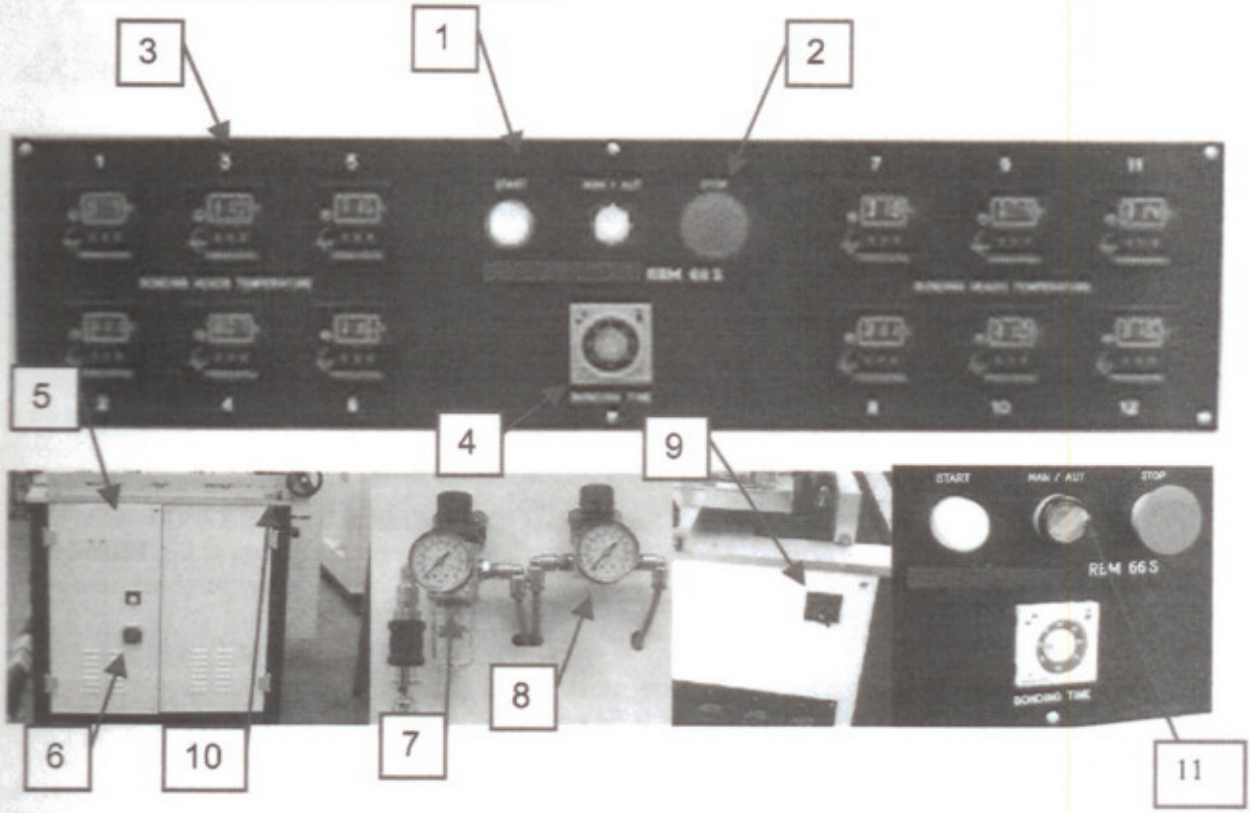

Fig. E

1 START Button
2 EMERGENCY- STOP Button
3 TEMPERATURE CONTROLLER (From 1÷ 12)
4 BONDING – TIME Timer
5 MAIN POWER ON Light
6 MAIN POWER SWITCH
7 MAIN PRESSURE REGULATOR
8 BONDING PRESSURE REGULATOR
9 TEMPLATE LIFTING SELECTOR
10 MICROSWITCH FOR TEMPLATE IN
11 MANUAL –AUTOMATIC SELECTOR

- **START Button (1)**

This lighted button enables the operative functions of the machine. It can be switched OFF by pressing the EMERGENCY– STOP Button (2)

- **STOP Button (2)**

By pressing this button the machine stops immediately and the operative functions are inhibited.

NOTE !

THIS BUTTON DOES NOT HAVE AN AUTOMATIC RETURN. TO RESTART THE MACHINE IT NEEDS TO PULL IT IN THE OFF POSITION.

- **TEMPERATURE CONTROLLER (from 1÷ 12) (3)**

These instruments control the temperature of the bonding welders . The right temperature can be set on respective 12 hot welder heads. When the red LED (small light) is on, it means that its head is heating up.

- **BONDING TIME (4) Timer**

This timer counts the bonding time which is set by its setting knob. During the set time the 6 hot pliers close on the book.
The timer has different scale values (seconds, minutes, hours). It should be set at value of about 1 minute.

- **MAIN POWER ON Light (5)**

When this light is on, it indicates that the main power switch is ON (Position 1). The machine is therefore ready to work.

- **MAIN POWER SWITCH (6)**

This switch must be turned to the position 1 before starting the machine. The white pilot lamp is lighted on. This, however, will not make the machine started unless the start button is not pushed.

- **MAIN PRESSURE REGULATOR (7)**

This is the air pressure regulator for all pneumatic services of the machine.
It must be set at 6 bar.

- **BONDING PRESSURE REGULATOR (8)**

This regulator adjusts the pressure of the 6 hot pliers during the bonding action. It must be set at about 3 bar.

- **TEMPLATE LIFTING SELECTOR (9)**

By this selector the operator can lift the template for few millimeters. In this way the layers book is disconnected from registration pins so that it can be removed easily without any mechanical stress.

- **MICROSWITCH FOR TEMPLATE IN (10)**

This sensor allows the timer starting for bonding action.

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4.1 STARTING THE MACHINE (FIG. E)

Switch on the main power switch (ref. 6). The pilot lamp (ref. 5) will light on , then pull out the red Stop button (ref. 2) and push the Start button (ref. 1). This will automatically light on and the 12 Temperature Controllers as well (ref.3).
It is possible now to set the bonding temperature on each temperature controller. The right setting value should be in the range of 240 ÷ 300 °C.
The 12 hot heads are very fast for temperature reading (1 minute is the typical time).
Set now the bonding time on the timer (ref.4). Typical range of time is 30 ÷ 60 sec.
The bonding pressure should be set at a typical value of about 3 bar. (ref. 8).
The template lifting selector (ref. 9) must be in "Down" position to allow the registration pins working.

4.2 OPERATING SET-UP

The procedure of bonding operation takes two steps : The book preparation and the sticking action. Before starting a production, it is necessary to set all the machine parameters as described in the following paragraph.

4.2.1 Process parameters

The followings are the suggested values for a good bonding action :

- **Bonding pressure**

We suggest to work with a value of about 3 bar.

- **Bonding time : (range 30 ÷ 60 sec)**

The bonding time must be set at a value in accordance with the innerlayer and/or book thickness.
The time must be increased when the book or the material are thicker.

Ex.

1) 10 layers – Thickness =0,1 mm

   Book thickness = 1,6 mm

   Suggested bonding time = 40 sec (at 240°C)

2) 6 layers - Thickness = 0,3 mm

   Book thickness = 1,6 mm

   Suggested bonding time = 30 sec (at 240 °C)

- **Bonding temperature : (range 240 °C ÷ 300 °C)**

The bonding temperature must be set at a value in accordance with the innerlayers and/or book thickness.

This temperature must be increased generally when the book or the thickness of the material are higher.

Ex.

1) 10 layers – Thickness 0,1 mm

Book thickness = 1,6 mm

Suggested bonding temperature = 240°C (40 sec)

2) 6 layers – Thickness 0,5 mm

Book thickness = 2 mm

Suggested bonding temperature = 280 °C (40 sec.)

NOTE!

DUE TO SMALL CONSTRUCTIVE DIFFERENCES OF HOT HEADS, THE BONDING RESULTS (IN COLOR) COULD NOT BE PERFECTLY EQUAL IN ALL SIX POINTS. THE OPERATOR SHOULD SLIGHTLY MODIFY THE TEMPERATURE SETTING VALUE ON EACH HEAD OF BOTH TOP AND BOTTOM SIDES TO OBTAIN THE SAME RESULTS FOR ALL BONDED POINTS. WE RECOMMEND TO MAKE TEST PERIODICALLY TO VERIFY THE GOOD ADHESION OF RESIN AND LAYER AT THE BONDING POINTS. THIS TEST CAN BE DONE BY TWISTING SLIGHTLY THE BOOK – ONCE COLD – AND CHECKING THE CAPACITY OF THE SIX STUCK POINTS.

- **Hot heads leveling**

It is very important for a good product quality to have each pin of hot heads at the same level of the template.

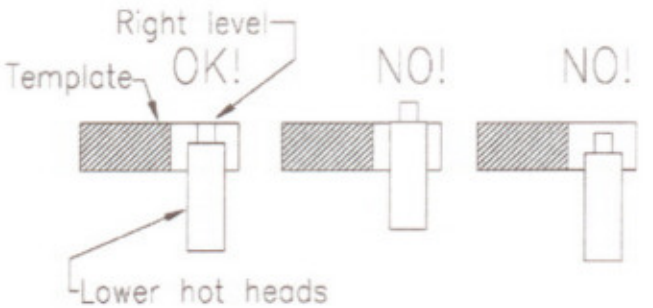

Fig. F

For level adjusting we suggest to switch off the machine, disconnect the compressed air, and AWAIT **THE HEADS GET COOL DOWN.**

When the heads are at room temperature, move them by hands and check the level as Fig. F.

The level can be adjusted by moving the block as the Fig. G.