

**I N S T R U C T I O N S**



# **MINI 2000**



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# MINI 2000

## INSTRUCTIONS FOR THE INSTALLATION, USE, MAINTENANCE AND GUARANTEE

### PACKAGE CHECK

#### The sales package contains:

- 1 Polymerizer Mini 2000.
- 1 work holder basket.
- 1 pair of work holder pliers.
- 2 tubes, diameter 6 x 4 mm, length 3 mt with ring joints at both ends. The red tube for the drainage of the polymerization liquids is already connected to the drainage outlet of the machine. The blue tube which supplies the compressed air is to be connected.
- 1 electric cable with plug and socket.
- 1 instruction sheet.
- 1 guarantee.
- 1 declaration of CE conformity.

## THE INSTALLATION AND STARTING CHECKS

### INSTALLATION

#### Preliminary instructions:

Make sure that the mains supply is earthed and equipped with general protection (safety switches). Check that the voltage is correct for the machine.

Check that the pressure supplied by the air compressor is not superior to 10 bar.

Position the machine on a flat, stable surface in a damp free environment, in such a way that the commands situated also in the posterior part are easily accessible and will allow a rapid disconnection of the mains, if the need arises.

#### Preparation of the machine:

1. Set the pneumatic valve **015** to OUT.
2. Connect the blue tube to the output point of the air compressor and to the inlet **030**. Firmly secure the joints with a suitable pair of pliers or spanner.
3. Connect the red tube (already inserted into the liquid's drainage outlet **027**) to the point of drainage.

#### NB:

A fixed point of drainage should only be used if one intends to work exclusively with water; otherwise use an open container or a closed container with a breathing hole and large enough (10 lt) to allow for the expansion of the liquid under pressure and its collection. Firmly secure the tube to the container to avoid spillage of the drainage liquid.

4. Set the master switch **024** to OFF.
5. Insert the electric supply cable **029**.

#### For your safety:

- *Keep this instruction sheet in easy reach of the machine.*
- *Make sure that all the operators have read this instruction sheet.*
- *Check that the container for the drainage of the liquids under pressure is adequate for their expansion and collection: the drainage into an hermetically closed container could result in it exploding due to excess pressure.*
- *Check that the mains is earthed correctly and the safety switches are functional before connecting the machine.*

### CHECKS PRIOR TO STARTING

The following are a series of trials and controls which should be carried out to check the correct functioning of the machine.

#### Pressure control:

1. Close the lid of the polymerization chamber **003**, turning until firmly secured.
2. Set the pneumatic valve **015** to IN.
3. Check the pressure on the manometer **014**. The machine is designed to withstand a working pressure of 6 bar: the working pressure can be modified between 1 and 6 bar by the use of the pressure regulator **031** which is situated at the back of the machine. To regulate the pressure, pull

the knob outwards, turn until the desired pressure has been reached, then push the knob in until it clicks.

4. Drain the pressure by setting the valve **015** to OUT.

### **For your safety:**

*Never exceed the pressure of 6 bar, this being the maximum working pressure.*

### **Heating and temperature control:**

1. Set the master switch **024** to ON. The warning light on the switch will light up. The red warning light on the front panel **013** will light up (current inserted).
2. Set the working temperature (between 40°C and 120°C) by turning the thermostat knob **034**.
3. Set the cycle selector **012** to MAN: the orange coloured resistor warning light will light up indicating that heating up has started.
4. Once these checks have terminated, turn the thermostat knob **034** back to STOP (the resistor's warning light **013** will go out) and disconnect the electrical supply by setting the master switch **024** to OFF.

### **Time control (of polymerization):**

1. Turn the knob of the timer **011** to set the desired time.
2. On turning the knob of the timer **011** back to zero the machine will emit an acoustic signal.

### **Trial run: manuel cycle/automatic cycle:**

The machine can function in cycle MAN (manuel) or AUTO (automatic), set the selector **012** to the cycle desired.

1. Selecting the automatic cycle Auto:
  - time has priority over temperature: if the polymerization time has not been set, heating up will not occur;
  - therefore the timer knob **011** acts as the starting switch for the polymerization cycle (provided that the master switch **024** has been set to ON);
  - at the end of the set time, the machine emits a warning sound to signal the termination of the cycle, the heating is interrupted (even if the thermostat knob **034** remains set to the predisposed temperature) and natural cooling begins.
2. Selecting the manuel cycle MAN:
  - time and temperature are independent: by setting the time the heating up process starts automatically.
  - at the end of the set time, the machine emits a warning sound to signal the termination of the cycle, the heating remains inserted to the pre-set temperature and natural cooling does not take place.

### **Control of the insertion and drainage of the polymerization liquid:**

1. Open the lid **003** of the polymerization chamber.
2. Pour the polymerization liquid into the chamber **021**, up to a height of 4 cm below it's upper border.
3. Securely close the lid of the chamber **003**.
4. Set the pneumatic valve **015** to IN (the compressed air pressurizes the polymerization chamber).
5. Turn the drainage tap **023** slowly (to avoid violent gushes) in an anti-clockwise direction, in this way the liquid under pressure will be completely drained.
6. On terminating the checks, immediately close the drainage tap **023** by turning it in a clockwise direction and set the pneumatic valve **015** to OUT, thereby interrupting the influx of compressed air.

### **The use of the work holder basket 035:**

The work holder basket **035** allows the immersion and removal of the articles to polymerize without them coming into contact with the polymerization liquid (normally the basket is used for fixed prostheses, larger articles may have to be inserted into the polymerization chamber without the help of the basket). The basket **035** is inserted into the chamber and rested (not immersed) on the surface of the polymerization liquid, with the hollow part in contact with the liquid and the guiding fins on top, in this way, when pushed to the bottom during the closure of the chamber lid **003** an air bubble is formed underneath, which on the reopening of the chamber lid **003** will bring the basket to the surface containing the still dry article.

### **For your safety:**

*Check that the point where the liquid drains is adequate and functional, as previously indicated.*

## **OPERATIVE PROCEDURES**

### **THE POLYMERIZATION CYCLE**

#### **Preliminary instructions:**

After having poured the polymerization liquid into the autoclave **021**, set the master switch **024** to ON. If needed, position the work holder basket **035** as described in the previous paragraph.

### To start the polymerization cycle:

1. Select the manual or automatic cycle by setting the appropriate selector to MAN or AUTO.
2. Place the article to be polymerized on the basket or into the chamber.

### For your safety:

*be careful, the polymerization liquid could burn if hot!*

3. Securely close the lid **003** of the polymerization chamber.
4. Set the temperature of polymerization with the thermostat **016/034**.
5. Set the time of polymerization with the timer **011/010**.
6. Insert the pressure by setting the valve **015** to IN (if necessary, the working pressure can be regulated with the regulator **031**).

The machine carries out the polymerization cycle. The heating up continues until the desired temperature has been reached with successive interventions of the resistor. The temperature is therefore constantly maintained by the thermostat, with a precision of  $\pm 2^{\circ}\text{C}$ .

### NB:

the time necessary for the machine to heat the liquid to the desired temperature is calculated by the timer as the total time of polymerization.

If the polymerization cycle is started with the liquid at room temperature, set a slightly longer time, to take into account the time needed for it to heat up.

### At the end of the polymerization cycle:

1. The timer on returning to zero emits the acoustic warning signal.
2. If the automatic cycle AUTO was selected, the machine suspends the heating and starts to cool naturally under pressure. The pressure is not drained.
- 2a. If the manual cycle MAN was selected, the machine maintains a constant temperature and pressure until the operator intervenes manually.

### The removal of the article:

1. Set the pneumatic valve **015** to OUT: the compressed air is drained.

### For your safety:

*The machine has been designed in such a way that the lid of the polymerization chamber will not open in the presence of even minimal pressure.*

*Even though, it is advisable to wait a few minutes before opening the lid after a polymerization has been performed in water at a temperature of over  $100^{\circ}\text{C}$ , so as to avoid jets of hot steam. Always be careful of the hot polymerization liquid, it could provoke burns.*

2. When the pressure is completely drained, open the lid **003** and remove the article.

## THE PRE-HEATING PROCEDURE

In many cases, it can prove useful to maintain the machine in function with the polymerization liquid at a convenient temperature, that is, always ready for use, therefore reducing the waiting time for the heating up of the liquid.

### Instructions:

1. Set the cycle selector **012** to MAN.
2. Set the desired maintenance temperature with the thermostat knob **016** (if water is to be used, do not exceed  $80^{\circ}\text{C}$ : it evaporates too quickly). The machine can remain indefinitely in this phase of maintenance. Check the level of liquid every now and then. Even if the polymerization liquid evaporates completely the machine does not run any risk of damage: it can function indefinitely even without liquid.
3. Always keep the lid of the autoclave closed when not in use.

## POLYMERIZATION IN A POLYMERIZATION LIQUID DIFFERENT TO THAT OF THE HEATING LIQUID

In some cases it can be preferable to polymerize different articles in different liquids, for example, total or partial prosthesis in water and fixed prosthesis in glycerine. In these cases a simple trick can prove useful to perform a polymerization in a second liquid (e.g.glycerine) without completely removing the first (e.g.water).

### Operation:

1. Fill the polymerization chamber approximately half full of water.
2. Insert the work holder basket upside down, that is, the hollow part above and the guiding fins underneath until they touch the bottom of the polymerization chamber.

3. Pour the glycerine into the hollow part of the work basket and place the article to be polymerized into it.
4. Set and perform the polymerization cycle, which will occur by means of the 'bain marie' technique (i.e.the water heats the glycerine through the work basket)

### POLIMERIZATION IN WATER

If water is adopted as the polymerization liquid it is advisable to use either distilled or de-mineralised water to reduce the formation of deposits and incrustations.

### POLYMERIZATION IN STEAM

The machine can also perform the polymerization in steam.

Operations.

1. Pour approximately 5 ml of water into the chamber of polymerization.
2. Set and perform the desired polymerization.

### POLYMERIZATION IN AIR

It is possible to perform the polymerization in air. The machine runs no risk of damage by operating without liquids.

**Operations:**

1. Do not pour any liquids into the polymerization chamber.
2. Set and perform the desired polymerization.

### PRESSURIZATION OF THE OPEN AUTOCLAVE. (INCORRECT OPERATION)

Wrong movements can cause the insertion of pressure without having closed the lid of the chamber of polymerization **021**. There is no risk of danger: the compressed air that enters into the polymerization chamber will simply expel the gasket from it's position without provoking spurts or sprays of liquid.

The opening of the lid whilst the machine is under pressure is impossible:

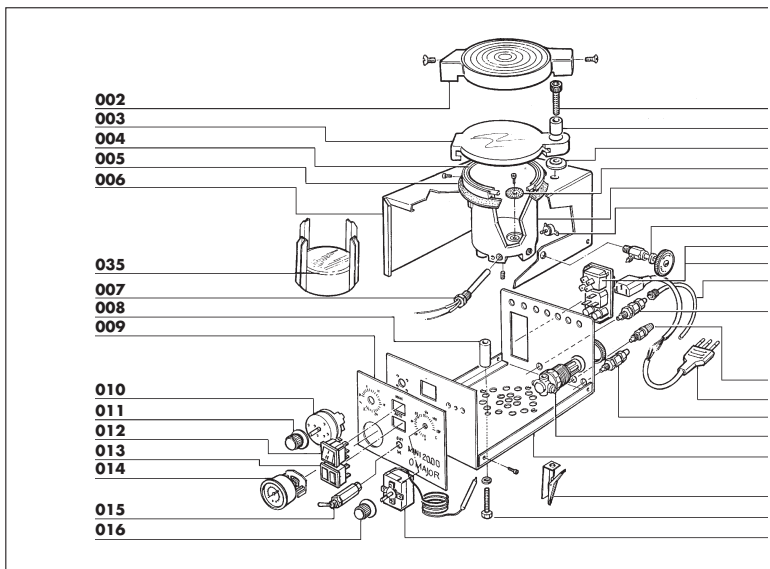
a safety device blocks the rotation of the lid, impeding the opening.

**For your safety:**

*While functioning, all the parts of the machine heat up. Although it is equipped with protection and insulation, it is however, advisable to avoid accidental contact.*

*In the case of an emergency, disconnect the mains by removing the posterior current tap **024** and disengage the compressed air supply.*

## MAINTENANCE, CASES OF MALFUNCTIONING, REPAIRS



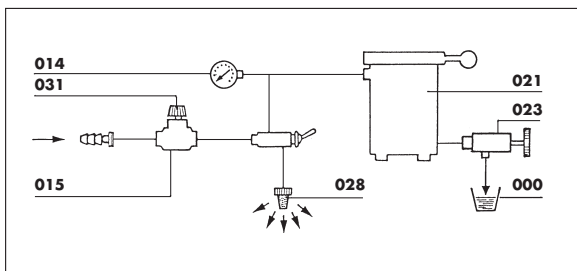
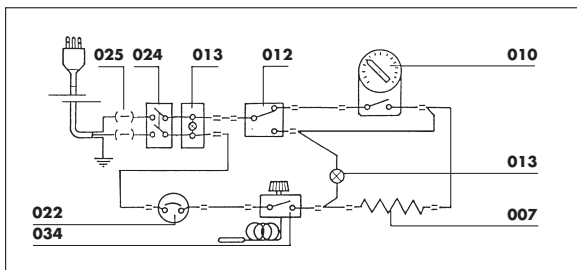
## MAINTENANCE

The machine needs no specific maintenance. To ensure an efficient and durable functioning of the machine, we recommend :

1. To lubricate the lid's gasket **004** every **500** cycles or at least once a month, with silicone oil or similar material and to substitute it every **2,000** cycles or after a year of use.
2. To check periodically all the joints and the compressed air and drainage tubes and substitute them if necessary.
3. To periodically clean the external parts of the machine and the chamber of polymerization with non corrosive substances.
4. To carry out a complete revision of the machine every **10,000** cycles or after five years of use, by the manufacturer or by authorised persons.

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## CASES OF MALFUNCTIONS

### Malfunction

A leakage of compressed air from the air input tube fitting **030** (a hissing noise can be heard).

There is a leakage of compressed air inside the machine (a hissing noise can be heard)

The manometer does not indicate expected pressure.

The drainage valve **028** is set to OUT, but drainage is very slow.

On opening the drainage tap **023**, the liquid does not drain.

On setting the temperature, the orange warning light **013** does not light up and the heating does not commence.

On setting the temperature, the orange warning light **013** lights up but the heating does not commence.

On setting the temperature, the orange warning light **013** does not light up but the heating commences.

On setting the timer **011** it does not adhere to the time cycle desired.

### Intervention

Identify the leakage point, if necessary tighten the joints or substitute the connecting tube.

Contact our customer assistance service.

Select the desired pressure with the pressure regulator **031**. If this proves ineffective, contact our customer assistance service.

Check that the drainage filter is not blocked: clean or substitute it as necessary. Otherwise, contact our customer assistance service.

Check that there is pressure, necessary for the drainage, in the machine. Otherwise, check that the drain is not blocked.

Ascertain the selection of the MAN cycle, check the fuses in the posterior current tap **024**. Contact our customer assistance service.

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Contact our customer assistance service.

## INACTIVITY OF THE APPLIANCE

If it is to remain inactive for long periods, it is recommended to follow this procedure.

1. Disconnect the machine from the mains by removing the plug **024**.
2. Drain the polymerization liquid, waiting a few seconds to make sure that any residue of air left in the tubes, is also drained.
3. Carefully clean the chamber of polymerization and the external parts of the machine.
4. Close the chamber of polymerization.

### **For your safety:**

*on reactivating the machine check all the joints, compressed air and drainage tubes and the adequacy of the drainage point of the polymerization liquid.*

## REPAIR PROCEDURES

For maintenance interventions, whilst still under guarantee, always contact your supplier for the dispatch to Major Prodotti Dentari or to persons authorised by them. The guarantee will immediately be considered expired if maintenance interventions are carried out by anyone not authorised by Major Prodotti Dentari, the level of security of the machine can also be compromised.

### **For your safety:**

*the maintenance of electrical appliances must be carried out by trained and expert persons. Before carrying out any type of intervention on the machine it must be completely disconnected from the mains by removing the plug **024**.*

Once the guarantee has expired, it is advisable to always have the maintenance interventions carried out by the Major Prodotti Dentari or by persons authorised by them.

*Explicit exclusions of liability.*

*The Major Prodotti Dentari accepts no liability for damage to people or things deriving from maintenance interventions which were not carried out by them or by persons authorised by them with original parts.*

It is forbidden to allow operators without the necessary experience and training to use the machine, in particular, untrained dental laboratory technicians. Maintenance and repair specifications are only available to persons authorised by Major Prodotti Dentari S.r.l.

*Explicit exclusions of liability.*

*The Major Prodotti Dentari accepts no liability for damage to people or things, deriving from maintenance interventions carried out on electrical and pressure machines by inexperienced or untrained persons, that is, the type of interventions that this instruction sheet has explicitly forbidden.*

## **GUARANTEE**

The machine is guaranteed for twelve months from the moment of consignment by the supplier. The guarantee covers spare parts and repairs but does not include the return postal costs.

The guarantee, together with a copy of the sales invoice from your supplier, must be sent to the Major Prodotti Dentari S.r.l. in order to validate the guarantee.

## **TECHNICAL DATA**

Diameter of the chamber of polymerization:	100mm
Total capacity of the chamber of polymerization:	850ml
Working pressure:	1 to 6 bar.
Maximum working pressure:	6 bar.
Regulation of time:	1 to 30 min
Regulation of temperature:	40 to 120°C
Pre-heating time 20-80°C:	approx 8 min
Voltage:	220 V 50/60 Hz
Total wattage:	500W
Dimensions:	180 x 290 x 180 mm
Weight:	7,5 kg



## SPARE PARTS

<b>FMD601CP001</b> .....	MINI 2000 Machine
<b>601CP002</b> .....	Insulating cover
<b>601CP003</b> .....	Lid
<b>601CP004</b> .....	Seal Gasket
<b>601CP005</b> .....	External Gasket
<b>601CP006</b> .....	Timing Case
<b>601CP007</b> .....	Resistor
<b>601CP008</b> .....	Spacer
<b>601CP009</b> .....	Frontal panel
<b>601CP010</b> .....	Timer
<b>601CP011</b> .....	Timer knob
<b>601CP012</b> .....	Selector
<b>601CP013</b> .....	Warning Lights
<b>601CP014</b> .....	Manometer
<b>601CP015</b> .....	Pneumatic Valve
<b>601CP016</b> .....	Thermostat Knob
<b>601CP017</b> .....	Screw
<b>601CP018</b> .....	Spacer
<b>601CP019</b> .....	Washer
<b>601CP020</b> .....	Filter Disc
<b>601CP021</b> .....	Autoclave
<b>601CP022</b> .....	Safety Thermostat
<b>601CP023</b> .....	Drainage Tap
<b>601CP024</b> .....	Posterior "Polisnap" master switch
<b>601CP025</b> .....	Fuse
<b>601CP026</b> .....	Red Drainage Tube
<b>601CP027</b> .....	Water Drainage Outlet
<b>601CP028</b> .....	Exhaust Valve
<b>601CP029</b> .....	Supply Cable
<b>601CP030</b> .....	Air Input Pipe Fitting
<b>601CP031</b> .....	Pressure Regulator
<b>601CP032</b> .....	Frame
<b>601CP033</b> .....	Screw
<b>601CP034</b> .....	Thermostat
<b>601CP035</b> .....	Work Holder Basket
<b>601CP036</b> .....	Work Holder Pliers