

English

# Owner's Manual

CE  
0499



**Syncrus LS Delivery Unit**

Code. 300052900 Rev.03

**GNATUS** 

## PRESENTATION OF MANUAL

### INSTRUCTIONS FOR USE

#### EQUIPMENT:

**Technical Name:** Dental Delivery Units and Accessories

**Trade Name:** Syncrus LS Delivery Unit

**Brand:** GNATUS

#### Manufacturer/ Distributor:

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### ATTENTION

#### For greater safety:

Read and understand all the instructions contained in these Instructions for Use before installing or operating this Equipment.

**Note:** These Instructions for Use must be read by all the operators of this Equipment.

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## **DESCRIPTION OF THE EQUIPMENT**

### **Dear Customer**

Congratulations. You have made a good choice when you decided to buy a GNATUS QUALITY product comparable to the best products available in the World. This manual is a general presentation of your product and it will give you important details to help you to solve possible problems.

Please, read it and keep this with you.

### **Identification**

Technical Name: Dental Delivery Units and Accessories

Trade Name: Syncrus LS Delivery Unit

Brand: GNATUS



## DESCRIPTION OF THE EQUIPMENT

### Principles and bases applied to the functioning of the product

It has hoses with compressed air and connectors for the supply of handpieces (high and low rotation) and a syringe with air and water outlet.

### Description of Equipment

Delivery unit for dental use, for the activation and control of the syringe, rotary instruments, etc., providing greater proximity in the work field.

It has a side panel and central control panel (optional).

Structure made of steel with surface treatment via nanotechnology. Smooth painting with a high gloss and epoxy base, polymerized in an oven at 250°C, resistant to corrosion and cleaning materials.

Auxiliary tray made of steel with horizontal movement.

Delivery unit body made of high impact polyethylene.

Smooth hoses, without grooves or rifling, rounded, light and flexible.

It has translucent reservoirs easy to access with automatic pressurization of water for syringe/spray of the handpieces and chlorinated water for the "optional" Bio-System. The Bio-System is a disinfection system, which provides internal cleaning of the hoses and terminals via bactericidal liquid, preventing risks of cross contamination.

Connecting box, made of high impact polyethylene and having rounded corners.

Interchangeable coupling system, adaptable as per the requirement of the professional. Available in the pneumatic FLEX, mechanical FLEX and CART models (optional).

**PNEUMATIC FLEX:** coupled to the dental chair, with horizontal movements, swivel arm with horizontal and vertical movements, with a pneumatic locking device for the vertical movements, activated by a button located in the body of the delivery unit, and smooth movements due to the bushing system of Teflon with bronze.

**MECHANICAL FLEX:** coupled to the dental chair, with horizontal movements and adjustment of the vertical position through the snap ring.

**CART:** with the base on four casters, made of steel with smooth painting and rounded corners.

To guarantee the safe functioning of your equipment, use only the assemble configurations (Dental Chair, Dental and Water Units and Dental Light) supplied by Gnatus authorized Dealers / Technical Assistance.

**EN ISO 9001/2008 and EN ISO 13485/2003 Quality System**, assuring the products are manufactured under standart procedures.

Products manufactured in agreement with RDC 59/2000 - ANVISA - (Sanitary Surveillance National Agency).

## DESCRIPTION OF THE EQUIPMENT

### **Laser Hand Kit (optional item) – Features of the product:**

See the Owner`s Manual - Laser Hand

### **Curing light (optional item) – Features of the product:**

The Curing Light belongs to the newest generation of **LED** photo-activation devices. This abbreviation stands for **Light Emitting Diode**, a totally different type of light emission, if compared to conventional halogen equipment.

Unlike traditional devices, which generate wide-spectrum light and heat, this technology uses a cold light of the precise wave length needed to activate various dental products.

LED technology, which was recently introduced in Dentistry, brought about several useful features to those light-curing devices used in composite resin restoration. Besides being more durable, LED technology turned devices more compact, ergonomic and easier to install and transport. The emission of cold light within a precise wave length range ensures the safe cure of camphorquinone-activated composites, preventing dental heating, pulp damage or discomfort for both patient and dentist. Although being relatively new, this technology is nowadays in its second generation. LED safety and efficiency, now allied to high-energy emission, are available to all clinic procedures which require light-curing power, including bleaching treatments.

The light of 440nm-460nm wave length, allied to the high energy emitted by Curing Light, makes possible the multi-functionality of this device:

- **Direct restoration procedures:** composite resins, ionomers and adhesives.
  - **Indirect restorations:** adhesive cementation of laminates, inlays, esthetic pins and metal-free crowns.
  - **Dental Bleaching:** activation of bleaching gel and polymerization of gingival barriers.
- Compatible with 35% hydrogen peroxide-based bleaching gels.
- Attachment of braces and orthodontic accessories.
  - **Activation of light-cure materials**, such as sealants, surgical cements and covering bases.

Designed and built with cutting-edge technology, it meets the highest standards specified by world`s dental authorities.

Operation control display in handpiece, sound alarm with beep every 10 seconds and 4 beeps at the end of the cycle.

Advantages offered by Curing Light:

- More spectrally-selective light than conventional lamps.\*
- Cold light, it doesn't heat up the resin nor the tooth\*\*
- Light compact equipment that provides handling comfort.
- Low power consumption.
- Longer useful life of the light emitting diode (equivalent to 36.000.000 cycles of 10 seconds).
- It does not use optical filter.
- It does not require forced ventilation, thus avoiding noise emission.

We noted that the light emitted by the Curing Light is completely contained within the absorption interval of the photo starter, therefore it's 100% used, whereas the conventional equipment running on halogen lamps has non-used wave-length regions.

The Curing Light doesn't generate heat since it uses light emitting diodes.

The light conductor is removable, made out of high resistance polymer and of easy maintenance.

## DESCRIPTION OF THE EQUIPMENT

### **Ultrasound (optional item) – Features of the product:**

Piezoelectric Ultrasound, frequency of 30,000 Hz.

The Transducer with the piezoelectric system allows the insert to make precise and linear movements, being able to be used in widely differing dental specialties.

Fine adjustment of power, suited to each type of procedure.

In the procedures with cooling, it offers constant irrigation with control of flow.

It also allows dry work to be executed (condensation of amalgam, cementing of inlays/onlays etc).

### **FUNCTIONAL APPLICATIONS**

- Periodontics
- Endodontics
- Dentistics and Prosthesis

### **Bicarbonate jet (optional item) – Features of the product:**

The bicarbonate jet removes dark stains from teeth, caused by cigarette smoke, coffee, tea, etc, associated with bacterial plaque and not tartar.

Irrigation with a pneumatic system.

Autoclavable bicarbonate jet handpiece.

Internal pressurization through the terminal of the micro motor of the delivery unit, facilitating its functioning.

It dispenses with external air and water connections.

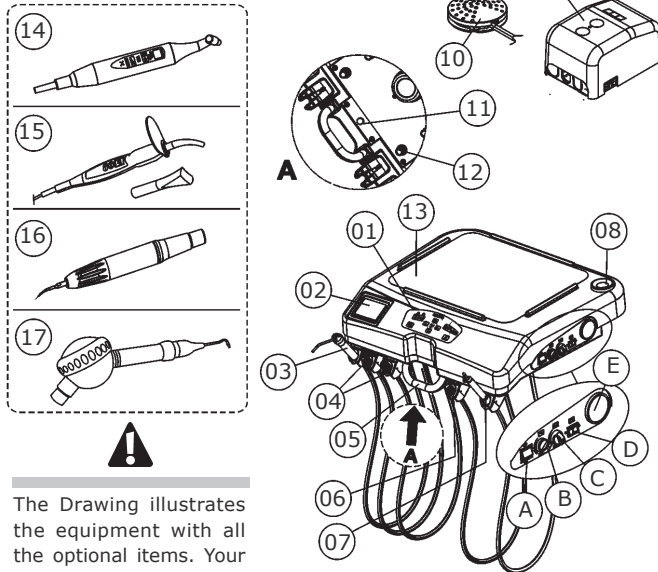
Internal depressurization through automatic bicarbonate sweeping.

## Indication of Equipment

This equipment is for dental use only. It must be operated and utilized by specialized professional (certified professional, according to the legislation of the country) and following the instructions of the manual. The operation of the equipment required, for the professional, the utilization of correct instruments and it should to be in perfect conditions of the use, and to protect the professional, the patients and others, in the eventual danger situation.

# MODULES, ACCESSORIES, OPTIONS AND TYPES OF COUPLING (SUPPORTS)

## Syncrus LS Delivery Unit (with panel)



The Drawing illustrates the equipment with all the optional items. Your delivery unit will only be composed of the items chosen during your purchase option.

### Basic configuration of the product (composed of)

G Coupling: Mechanical Flex, 1-3-Way Syringe, 2- TB/TM/FO high rotation terminals, 1-Terminal for TB/TM micro motor.

- 01 - Control panel
- 02 - X ray view (optional)
- 03 - Triple syringe
- 04 - High-speed-motor terminals (optional)
- 05 - Centered handle
- 06 - Low-speed-motor terminal (optional)
- 07 - Bicarbonate jet (optional)
- 08 - Bicarbonate reservoir (optional)  
"available in the delivery units configured with bicarbonate jet"
- 09 - Connection box
- 10 - Foot control
- 11 - Arm brake valve (optional) "used in the pneumatic Flex couplings"
- 12 - Water valve for Syringe /FO/MME/Scaler/bicarbonate jet (optional)
- 13 - Auxiliary trays
- 14 - Kit Laser Hand (optional)
- 15 - Curing Light (optional)

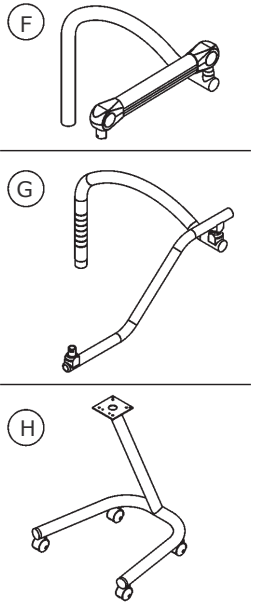
- 16 - Ultrasound (optional)
- 17 - Bicarbonate jet "Hand"(optional)

### Side command (see page 11)

- A - Main switch of delivery unit
- B - Regulator of ultrasonic power
- C - Regulator of MME rotation
- D - Inversion of MME rotation
- E - Manometer

### Couplings (options upon inquiry)

- F - Pneumatic Flex
- G - Mechanical Flex
- H - Cart

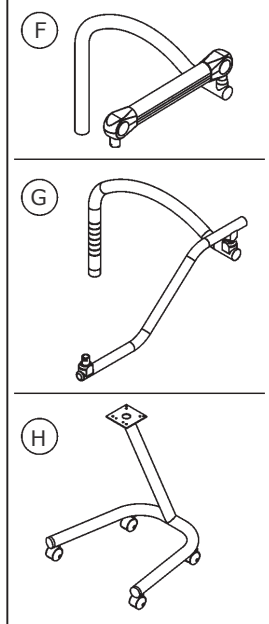
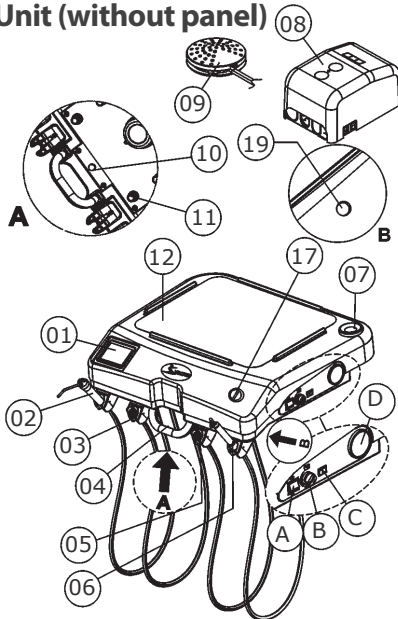
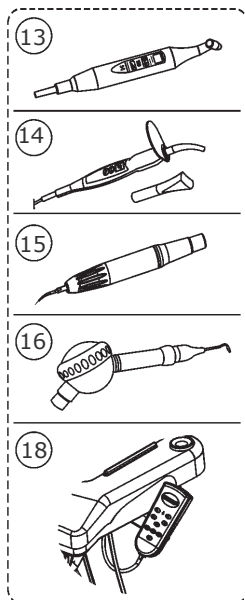


The contents of this page are of an informative nature, the equipment being able to differ from that illustrated. So, upon acquiring the product check the technical compatibility between equipment, coupling and accessories.



## MODULES, ACCESSORIES, OPTIONS AND TYPES OF COUPLING (SUPPORTS)

### Syncrus LS Delivery Unit (without panel)



#### Basic configuration of the product (composed of)

G Coupling: Mechanical Flex, 1-3-Way Syringe, 2- TB/TM/FO high rotation terminals, 1-Terminal for TB/TM micro motor.

- 01 - X ray view (optional)
- 02 - Triple syringe
- 03 - High-speed-motor terminals (optional)
- 04 - Centered handle
- 05 - Low-speed-motor terminal (optional)
- 06 - Bicarbonate jet (optional)
- 07 - Bicarbonate reservoir (optional)  
"available in the delivery units  
configured with bicarbonate jet"
- 08 - Connection box
- 09 - Foot control
- 10 - Arm brake valve (optional) "used in the  
pneumatic Flex couplings"
- 11 - Water valve for Syringe /FO/MME/  
Scaler/bicarbonate jet (optional)
- 12 - Auxiliary trays
- 13 - Kit Laser Hand (optional)
- 14 - Curing Light (optional)
- 15 - Ultrasound (optional)

- 16 - Bicarbonate jet "Hand"(optional)
- 17 - Drive button of the water in the basin  
(optional)

- 18 - Control Panel Kit (optional)
- 19 - Bio-System operation (optional)

#### Side command (see page 11)

- A - Main switch of delivery unit
- B - Regulator of ultrasonic power
- C - X-ray viewer activation (optional)

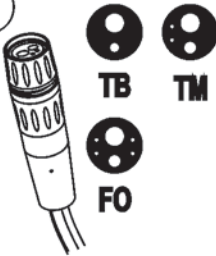
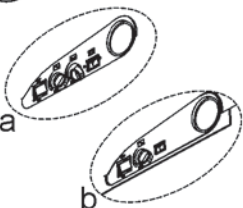
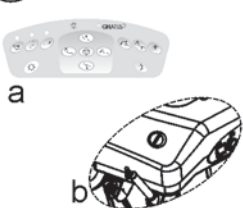

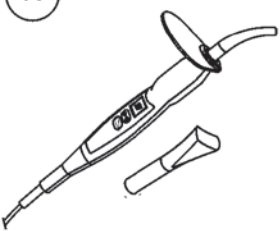

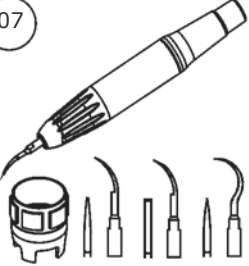
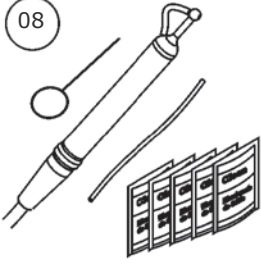

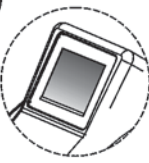

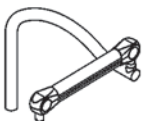
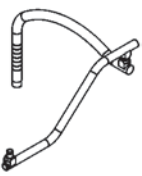
#### Couplings (options upon inquiry)

- F - Pneumatic Flex
- G - Mechanical Flex
- H - Cart

The contents of this page are of an informative nature, the equipment being able to differ from that illustrated. So, upon acquiring the product check the technical compatibility between equipment, coupling and accessories. The Drawing illustrates the equipment with all the optional items. Your delivery unit will only be composed of the items chosen during your purchase option.



# MODULES, ACCESSORIES, OPTIONS AND TYPES OF COUPLING (SUPPORTS)

<p>01</p> 	<p>02</p> 	<p>03</p> 	
<p>04</p> 	<p>05</p> 	<p>06</p> 	
<p>07</p> 	<p>08</p> 	<p>09</p> 	
<p>10</p> 	<p>11</p> 	<p>12</p> 	<p>13</p> 

# MODULES, ACCESSORIES, OPTIONS AND TYPES OF COUPLING (SUPPORTS)

## 01 - Terminals (optional)

- MME:Electrical micro motor terminal
- FO:Optical fiber terminal
- TM:Midwest terminal
- TB:Borden terminal

## 02.a - Side command (with panel)

- Main switch of delivery unit (optional)
- Regulator of ultrasonic power "available in the delivery units configured with scaler"
- Regulator of MME rotation (optional) "available in the delivery units configured with MME"
- Inversion of MME rotation (optional) "available in the delivery units configured with MME"
- Manometer (optional)

## 02.b - Side command (without panel)

- Main switch of delivery unit (optional)
- Regulator of ultrasonic power "available in the delivery units configured with scaler"
- Manometer (optional)
- Activation of X-ray viewer (optional) "available in the delivery units configured with X-ray viewer"

## 03.a - Control panel (optional)

## 03.b - Drive button of the water in the basin (optional)

## 04 - Hand Laser kit (optional)

(Registration # Anvisa 80051420005)

- Laser Hand
- Safety goggles "patient and professional"
- Manuals

## 05 - Curing light + tip for 3 teeth (optional)

## 06 - Control Panel Kit (optional)

- Up/down backrest keys
- Up/down seat keys
- Reflector activation key
- Working positions 1, 2 and 3 keys
- Key Return to zero

## 07 - Ultrasound kit (optional)

- Ultrasound
- Tightening wrench
- Inserts "nº 1, 2 and 10P"

## 08 - Bicarbonate jet kit (optional)

- Bicarbonate jet
- Opener
- Hose
- Sachet of bicarbonate

## 09 - Bicarbonate jet kit "Jet Hand"(optional)

- Bicarbonate jet
- Opener
- Covers for reservoir
- Rings for sealing
- Sachet of bicarbonate
- Manual

## 10 - X-ray viewer (optional)

## 11 - CART coupling (optional)

## 12 - Pneumatic FLEX coupling (optional)

## 13 - Mechanical FLEX coupling (optional)



The use of any part, accessory or material not specified or foreseen in these instructions for use is entirely the user's responsibility.



The accessories described above shall never be able to be sold separately from the product.

# TECHNICAL SPECIFICATIONS

## Technical features of the Delivery Unit and its accessories

### General

Model
Syncrus LS Delivery Unit
Classification of Equipment as per ANVISA:
Class II
Classification of Equipment as per standard IEC 60601-1:
Protection against Electric Shock - Type B and Class I Equipment (IEC 60601-1)
Degree of safety of application in presence:
Equipment not suited to an anesthetic mixture inflammable with air, oxygen or nitrous oxide.
Mode of Operation
Continuous operation with intermittent load

### Power Supply

Power Supply Voltage (coming from dental chair)
127/220 V~ (Selectable)
Frequency
50/60 Hz
# phases
Single Phase / Biphasic
Input fuse (coming from dental chair)
5A Delayed action
Voltage in equipment (coming from dental chair)
12 and 24 V~

### Other specifications

Inlet air pressure
80 PSI (5,52 BAR)
Inlet air pressure - Syringe
40 PSI (2,76 BAR)
Maximum consumption of air (dental set)
80 l/min

## TECHNICAL SPECIFICATIONS

Capacity of water reservoir
800ml
High rotation air consumption
9 l/min
High rotation water consumption
0,02 l/min
Syringe air consumption
17 l/min
Syringe water consumption
0,1 l/min
Delivery unit tray`s maximum load capacity
2Kgf
Net weight of Delivery Unit with "Pneumatic FLEX" coupling (with all the options)
22,5 Kg
Gross weight of Delivery Unit with "Pneumatic FLEX" coupling (with all the options)
27,5 Kg
Net weight of Delivery Unit with "Mechanical FLEX" coupling (with all the options)
17 Kg
Gross weight of Delivery Unit with "Mechanical FLEX" coupling (with all the options)
22 Kg
Net weight of Delivery Unit with "CART" coupling (with all the options)
15,10 Kg
Gross weight of Delivery Unit with "CART" coupling (with all the options)
18,80 Kg

## Specifications of Curring Light

Power
5,2VA
Light source
1 LED
Active medium
Semiconductor LED (InGaN)
Wavelength
440nm - 460nm

# TECHNICAL SPECIFICATIONS

Timer
90 seconds
Timer alarm
sound alarm with beep every 10 seconds and 4 beeps at the end of the cycle
Activation
Through the hand-piece button
Light conductor
Made out of special polymer, rotational, removable and reuse sable.
Hand-piece body
ABS injected

## Specifications of Ultrasound


Frequency of Vibrations of Ultrasound
30,000Hz
Consumption of irrigating liquid
28 ml/min
Power consumed
15VA ±10%
Transducer system
Piezoelectric ceramic

# TECHNICAL SPECIFICATIONS

## Eletromagnetic emissions

Guidelines and manufacturer's declaration - electromagnetic immunity			
The Syncrus LS Delivery Unit is made to be used in the electromagnetic environments specified below. The client or the user of the Syncrus LS Delivery Unit must be sure that it is used in such environment.			
Immunity test	ABNT Test level NBR IEC 60601	Level of compliance	Electromagnetic environment Directives
Electrostatic discharge(ESD) IEC 6100-4-2	± 6 kV Contact ± 8 kV Air	± 6 kV Contact ± 8 kV Air	Floors should be wooden, concrete or ceramic. If the floor is covered with synthetic material, the relative humidity should be at least 30%
Quick electric transitory phases / train of pulses ("Burst") IEC 61000-4-4	± 2 kV in power supply lines ± 1 kV in input / output lines	± 2 kV in power supply lines ± 1 kV in input / output lines	It is advisable that the quality of the power supply should be that of hospital or typical commercial environment
Surges IEC 61000-4-5	± 1 kV lines (s) to lines (s) ± 2kV lines (s) to ground	± 1 kV lines (s) to lines (s) ± 2kV lines (s) to ground	It is advisable that the quality of the power supply should be that of hospital or typical commercial environment
Reduction, interruption and variance of voltage in power supply input lines IEC 61000-4-11	< 5% $U_t$ (>95% drop in $U_t$ ) for 0,5 cycle 40% $U_t$ (60% drop in $U_t$ ) for 5 cycles 70% $U_t$ (30% drop in $U_t$ ) for 25 cycles < 5% $U_t$ (>95% drop in $U_t$ ) for 5s	< 5% $U_t$ (>95% drop in $U_t$ ) for 0,5 cycles 40% $U_t$ (60% drop in $U_t$ ) for 5 cycles 70% $U_t$ (30% drop in $U_t$ ) for 25 cycles < 5% $U_t$ (>95% drop in $U_t$ ) for 5s	The recommended power supply quality is the same as used for commercial or hospital environment. If is required a continuous use during energy supply outages, it is recommended that the equipment be feed by an uninterruptible power supply or a battery.
Magnetic field in frequency of power supply (50/60Hz) IEC 61000-4-8	3 A/m	0,3 A/m	If an image distortion occurs, may be necessary place the equioment far from the supply frequency or to installa magnetic armour. The frequency magnetic field shall be measured at the installment place to assure that it is low enough.
NOTE $U_t$ is the a.c. power supply voltage before the application of the test level			

TECHNICAL SPECIFICATIONS

Guidelines and manufacturer's declaration - electromagnetic immunity			
The Syncrus LS Delivery Unit is made to be used in the electromagnetic environments specified below. The client or the user of the Syncrus LS Delivery Unit must be sure that it is used in such environment.			
Immunity test	ABNT test level NBR IEC 60601	Level of compliance	Electromagnetic Environment Directives
RF conducted IEC 61000-4-6  RF radiated IEC 61000-4-3	3 vrms 150 kHz up to 80 MHz  3 V/m 88 MHz up to 2,5 GHz	3 Vrms  3 V/m	<p>It is advisable that portable and mobile RF communication equipment is not used near any part of the equipment, including cables, with a separation distance less than the one recommended, calculated from the equation applicable to the frequency of the transmitter.</p> <p>Recommended separation distance:</p> <p><math>d = 1,2\sqrt{P}</math></p> <p><math>d = 1,2\sqrt{P}</math> 80 MHz thru 800MHz <math>d = 2,3\sqrt{P}</math> 800 MHz thru 2,5MHz</p> <p>Where P is the nominal maximum power of output of the transmitter in watts (W), as per the manufacturer of the transmitter, and d is the recommended separation distance in meters (m).</p> <p>It is advisable that the fiel intensity from the RF, transmitter as determined by means of electric inspection on-site, <sup>a</sup> is less than the level of compliance in each frequency range <sup>b</sup>.</p> <p>There may be interference near the equipment marked with the following symbol:</p> 
NOTE 1      At 80MHz and 800MHz, the highest frequency range applies.			
NOTE 2      These directives may not be applicable in every situation. The electromagnetic transmission is affected by the absorption and reflection of structures, objects and people.			
<p><sup>a</sup> The field intensities set by the fixed transmitters, such as radio base stations, telephones (mobile phone, wireless) land mobile radio, amateur radio, AM and FM radio transmissions and TV transmissions can not be predicted with accuracy. Due to the RF fixed transmitters is recommended to install an electromagnetic inspection at the local in order to evaluate the electromagnetic environment. If at the place where the equipment is be using the field intensity level exceeds the conformity level for the RF above, is recommended to observe if the operations are normal. Whether abnormal operations are observed, additional procedures shall be necessary such as reorientation or replace the equipment.</p> <p><sup>b</sup> Whether above the frequency range of 150kHz to 80 MHz is recommended a field intensity below than 3 V/m.</p>			



## TECHNICAL SPECIFICATIONS

Recommended distances between portable and mobile RF communication equipments and the Syncrus LS Delivery Unit			
The Syncrus LS Delivery Unit is made to be used in an electromagnetic environment in which RF disturbances are controlled. The client or the user of the Syncrus LS Delivery Unit may help preventing electromagnetic interference by keeping a minimal distance between mobile and portable RF communication equipment (transmitters) and the Syncrus LS Delivery Unit, as recommended below, in accordance with the maximal voltage output of the communication equipment.			
Transmitter Maximum Output (W)	Separation distance according to transmitter frequency (M)		
	150 kHz to 80 Mhz $d = 1,2\sqrt{p}$	80 kHz to 800 <sup>o</sup> Mhz $d = 1,2\sqrt{p}$	800 kHz to 2,5 <sup>o</sup> GHz $d = 2,3\sqrt{p}$
0,01	0,12	0,12	0,23
0,1	0,38	0,38	0,73
1	1,2	1,2	2,3
10	3,8	3,8	7,3
100	12	12	23
For transmitters with a maximum nominal output power not listed above, the recommended d separation distance in meters (M) can be determined using an equation applicable to the frequency of the transmitter, where P is the transmitter maximum nominal output in watts (W) according to the transmitter manufacturer.			
<b>NOTE 1</b> At 80 MHz and 800 MHz, is applied the separation distance for the higher frequency range.			
<b>NOTE 2</b> These guidelines may not apply to all situations. The absorption and reflection from structures, objects and people affect the electromagnetic propagation.			

# TECHNICAL SPECIFICATIONS

Eletromagnetic emissions		
The Syncrus LS Delivery Unit is made to be used in the electromagnetic environments specified below. The client or the user of the Syncrus LS Delivery Unit must be sure that it is used in such environment.		
Emission test	Compliance	Eletromagnetic environment - Guide
RF emissions ABNT NBR IEC CISPR 11	Group 1	This equipment uses RF energy only for internal functions. However, its emissions are too low and it's unlikely to cause any interference in the equipments next to it.
RF emissions ABNT NBR IEC CISPR 11	Class B	This equipment is proper to be used in all establishments; including domestic settings and those directly connect to a public low voltage distribution which feeds domestic buildings.
Emissions of harmonics IEC 61000-3-2	Class A	
Fluctuation of Voltage / Emissions of flicker  IEC 61000-3-3	As per	

## Standards applied

**This product was tested and approved as per the standards:**

- NBR 60601-1:1997 - Equipamento Eletromédico- Parte 1: Prescrições gerais para segurança;
- NBR ISO 14971:2009- Produtos para a saúde - Aplicação de gerenciamento de risco a produtos para a saúde;
- EN ISO 13485-2003 - Quality Systems - Medical Devices;
- IEC 60601-1-2:2007 - Collateral Standard - Eletromagnetic Compatibility.
- EN ISO 9001:2008 - Quality Management System - Requirements
- RDC 59/2000 - Boas práticas de fabricação de produtos médicos - ANVISA

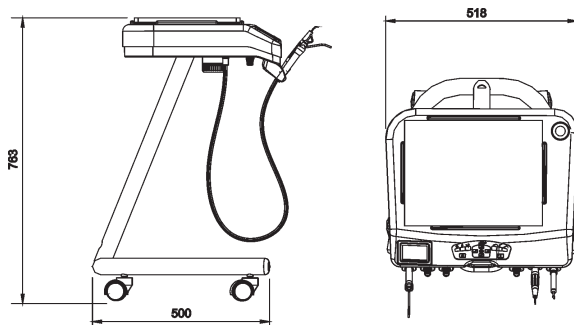


The Equipment maintains its condition of safety and efficacy, provided that it is maintained (stored) as mentioned in this instruction for use. Thus, the equipment will not lose or alter its physical and dimensional features.

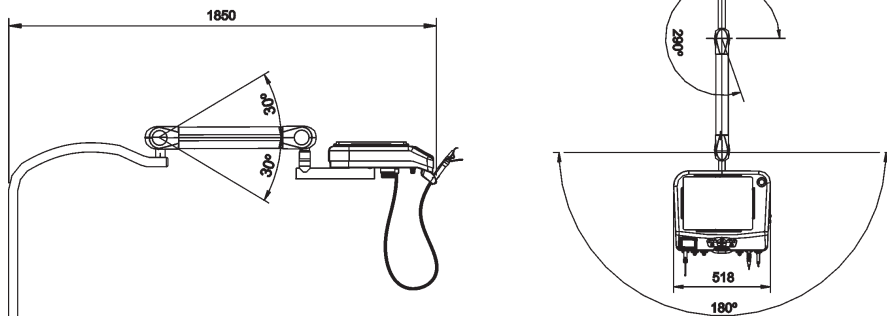
## TECHNICAL SPECIFICATIONS

### Dimensions (mm)

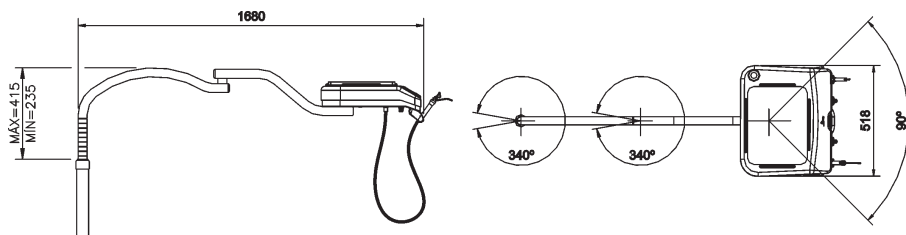
#### Delivery Unit with CART coupling



#### Delivery Unit with Pneumatic FLEX coupling





#### Delivery Unit with Mechanical FLEX coupling





# TECHNICAL SPECIFICATIONS


## Packing symbols


- 

Maximum stacking:  
It determines the maximum quantity of boxes which can be stacked during transportation and storage "as per packaging".
- 

Packing to be transported and / or stored avoiding humidity, rains and wet floor.
- 


Packing to be transported and / or stored with the harrows up.
- 


The packing must be stored and transported away from direct sun light exposure.
- 


Packing to be transported and / or stored with care (should not suffer drop and neither receive impact).
- 


Temperature limit for the packing to be stored or transported.


## Product symbols


- 


**Careful:** It indicates an important instruction for the operation of the product. Not following it can cause dangerous malfunctioning.
- 


Turned on
- 


**Note:** It indicates useful information for operation of the product.
- 


Turned off
- 


**Important:** It indicates an instruction of safety for operation of the product. Not following it, can lead to serious danger to the patient.
- 

B type equipment
- 

Warning - see the manual
- 

Landing (in many parts of the equipment) indicates the condition of being landed.
- 

Emergency stop
- 

Lift backrest.
- 

Lower backrest.

## TECHNICAL SPECIFICATIONS

### Product symbols



Lift seat.



Lower seat.



Determines the working position 1



It determines to spitting position / last position.



Determines the working position 2



Determines the position Return to zero.



Determines the working position 3



Reflector actuation



Bio-System operation



X ray view operation



Bowl's water flow



Cup filling



High-speed with FO



Electric low-speed-motor



Bicarbonate Jet



Curing Light



Triple syringe








Ultrasound



Electric low-speed-motor rotation inverter

# TECHNICAL SPECIFICATIONS

## Content of accessible and non-accessible demarcations

FABRICANTE E RESPONSÁVEL PELA GARANTIA			MANUFACTURER AND RESPONSIBLE FOR THE WARRANTY			FABRICANTE Y RESPONSABLE POR LA GARANTÍA		
			<b>GNATUS EQUIPAMENTOS MÉDICO-ODONTOLÓGICOS LTDA.</b> Rod. Abrão Assed, Km 53+450m - Ribeirão Preto - SP - Brasil					
EQUIPAMENTO	EQUIPMENT	EQUIPO	OPERAÇÃO	OPERATION	OPERACIÓN			
<b>EQUIPO SYNCRUS LS</b>			<b>CONTINUO, COM CARGA INTERMITENTE</b> <b>CONTINUOUS, WITH INTERMITTENT LOAD - CONTINUO, CON CARGA INTERMITENTE</b> Fotopolimerizador - Contínuo, com carga intermitente Curing Light - Continuous, with intermittent load - Lámpara de Fotocurado Contínuo, con carga intermitente T. ON: 90 s - T. OFF 90 s					
CONFIGURAÇÃO / CONFIGURATION / CONFIGURACIÓN			<b>EQUIPAMENTO DE CLASSE I</b> <b>CLASS I EQUIPMENT</b> <b>EQUIPAMIENTO DE CLASSE I</b> <b>Ultra-som - Contínuo, com carga intermitente</b> <b>Ultrasound - Continuous, with intermittent load</b> <b>Ultra-sonido - Contínuo, con carga intermitente</b> T. ON: 1 min - T. OFF 5 min.					
NUM. REGISTRO ANVISA: 10229030047			 Obelis S.A. Av. De Tervuren 34, bte 44, B-1040, Brussels, Belgium, Tel: 32 2 732 59 54, Fax 32 2 732 60 03 E-mail: mail@obelis.net			 499  		

# INSTALLATION OF EQUIPMENT



**The installation of this equipment requires specialized technical assistance (Gnatus).**



**OBS: These information also make part of the Manual of Installation and Maintenance of the equipment that can be found with the authorized Gnatus technician.**

- This equipment shall only be able to be unpacked and installed by a Gnatus authorized technician, under penalty of losing the warranty, as only (s)he has the information, suitable tools and training required to execute this task.
- Gnatus bears no responsibility for damages or accidents caused by poor installation executed by a technician not authorized by Gnatus.
- Only after the equipment has been installed and duly tested by the authorized technician representing Gnatus, will it be ready to start work operations.

## OPERATION OF EQUIPMENT

### Turning on / off the dental set

- Turn on the main switch of the Dental Chair. All the functions of the equipment will be enabled.
- The main switch has an internal LED which goes on when the dental chair is turned on.
- Turn the ON/OFF switch located on the side of the delivery unit.

### Positioning

- The FLEX coupling "item F, page 08" has horizontal and vertical movements, with pneumatic locking device.

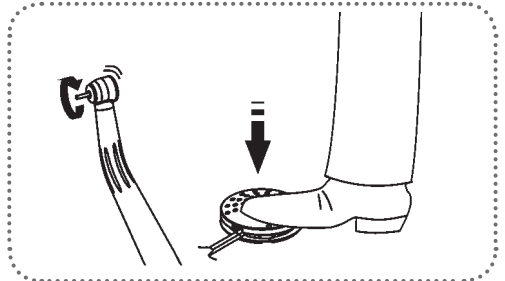
Maintaining the button "Arm brake valve" (item 11, page 08) pressed, place the delivery unit in the position desired, holding it by the handle, and release it to fasten it in this position.

### Activation of the Terminals

- For the functioning of the rotary instruments, remove the instrument to be used from the support, activate the foot control pressing it with your feet.



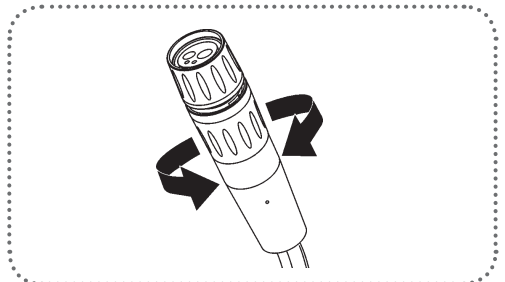
The power (air power supply) can be controlled by the operator with greater or less pressure on the foot control.



### Adjustment of Spray of "TB/TM high and low rotation terminals"

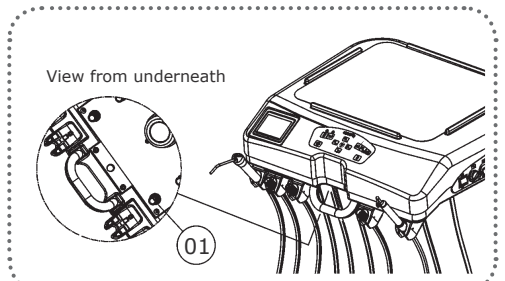
- The adjustment is made via a valve positioned in the terminal. Turn it in a clockwise direction to reduce the spray and in a counter-clockwise direction to increase it.

**Note:** As the "TB" double terminal does not have a spray this adjustment is not required.



### Adjustment of Spray of "MME/FO high and low rotation terminals"

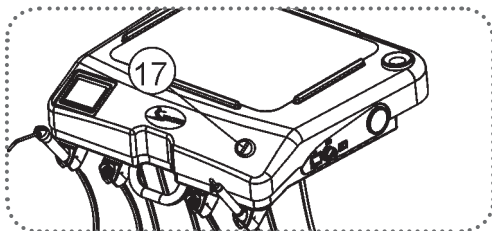
- The adjustment is made via the valves positioned under the box of the delivery unit (01). Turn it in a clockwise direction to reduce the spray and in a counterclockwise direction to increase it.



## OPERATION OF EQUIPMENT

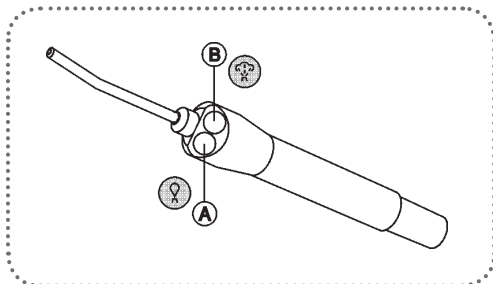
### Driving to the water in the basin to the model without the control panel

To drive the water in the basin press the button 17 and press it again to disable.



### Use of 3-Way Syringe

- Press button (A) for water to come out, (B) for air to come out or both simultaneously to obtain a spray.

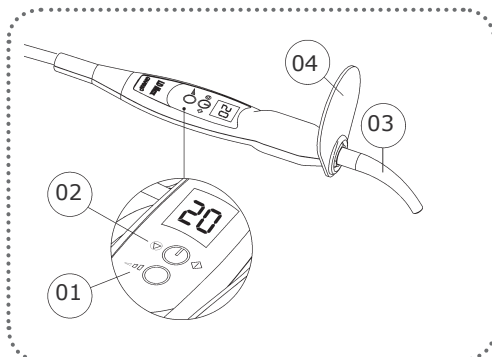


### Curing Light Activation

- Select application time, press time selection button (01), which values are: 10s (standard mode), 20s, 60s, 80s and 90s.

- To initiate a polymerization cycle, press the timer trigger (02), which generates a short beep every 10 seconds and a 4 beeps at the end of cycle.

- To interrupt a polymerization cycle just activate the timer trigger again (02).



#### IMPORTANT:

- Keep the light conductor tip (03) at least 2mm away from the restoration.
- Keep the light conductor (03) always protected by an expendable PVC film, which must be changed for every patient. This procedure protects the light conductor from scratches and other residues.
- Use the polymerization time recommended by the compound resin manufacturer and always perform restorations in incremental layers with a maximum thickness of 2mm.



#### WARNING

- Never aim the blue light beam towards the eyes
- Use the eyesight protection (04)
- In order to protect the eyes, the eyesight protection (04) filters only the blue light used for the resins polymerization, and it allows ambient light to pass through.



# OPERATION OF EQUIPMENT

## Laser Hand (optional)

The "Laser Hand Kit" is low intensity (780nm) and provides relief of acute and chronic pain, and speeds repair of damaged tissue by means of biostimulation effects of radiation. Eminently analgesic, anti-inflammatory and biomodulation effect.



### Applications:

- Inflammations;
- Oral mucous lesions;
- Dental hypersensitivity;
- Analgesia;
- Paresthesia;
- Alveolitis and pericoronitis;
- Acceleration of post surgical and injury cicatrisation;
- Decrease of edemas, bruising and scabbing;
- Distension, muscular spraining and articular pain;
- Acupuncture (optional).

## Activation of the "Laser Hand"

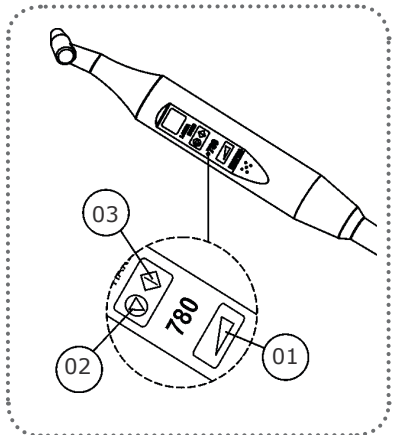
Turn on the main unit power switch, which will automatically turn on the laser.

To select application time, press the time selection button (01) with variations of: 01s to 90s. Maintain pressure on the key until desired time selection, which can be at 1-second intervals (1s, 2s, 3s, 4s, 5s, 6s, 7s...) or 10-second intervals (10s, 20s, 30s, 40s, 50s..).

To start, press timer activation button (01). A single beep will be heard, followed by 5 beeps at each conclusion.

The laser will remain active with a 10-minute program. After 10 minutes, a beep will inform that the laser is in standby mode.

To restart the cycle, press the key (02) which will sound 2 beeps and the last programmed selection will appear on the screen. To interrupt the cycle, press button (03).



**Note:** For a new program, in case desired time is less than the previous program, press (01) until the start of time "00".



**WARNING:** Never direct the red light towards eyes;

## OPERATION OF EQUIPMENT

### Ultrasound Activation

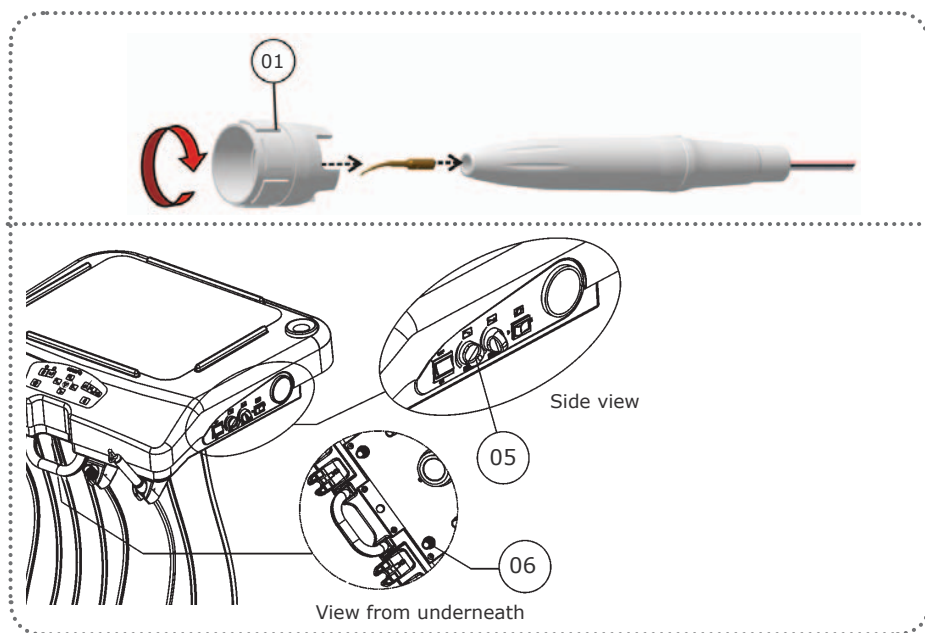
Remove the scaler handpiece from the support;  
Choose the suitable insert for the operation desired as per "Techniques and Applications";

Thread the insert chosen in the handpiece with the aid of the fastening wrench (01) and a slight tightening;

Activate the foot control and position the selector power (05) as per the sensitivity of the operation;

Adjust the water flow via the valve (06) located in the lower part of the dental unit.

At the end of the procedure release the foot control and place the handpiece in the support.



### IMPORTANT RECOMMENDATION

The shape and the weight of each insert are important facts to obtain a maximum performance of the generator of ultrasounds, the operator attention to these two characteristics, will assure the maintenance of the best performances of the units, however, we recommended that the structure of the insert is not altered (limiting it or twisting it), in the same way the aging of an inserted drives to an alteration of its original characteristic, becoming it ineffective.

Any insert that has been damaged by use or accidental impact should be changed.

## OPERATION OF EQUIPMENT

### Technical and applications

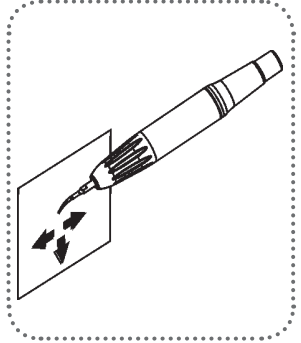
All the inserts of the Ultrasound have the particularity of vibrating in an only plane (front vibrations to back, and in the axis of the insert).

The lateral vibrations common to other destartarizators don't exit, the rectilinear displacement favors more precise approach of the tooth and of the gum.

The enamel and the cement are protected of the inutile shocks.

Inside of this main plane of vibration, the end of each insert is driven by small vibratory movements.

To obtain the maximum performance of the Ultrasound the operator should pay attention to the specific vibrations regulations of each insert.



### Periodontics

#### Insert N° 1 "Removal of supragengival calculus"

Tip N°1 is used for lingual, buccal and approximal supragingival scaling. Recommended for the removal of gross calculus.

Recommended power setting: 10-50%.



(it comes with the Ultrasound kit)

#### Insert N° 2 "Removal of supragengival calculus"

Tip N°2 is used for lingual and buccal supragingival scaling. Recommended for the removal of gross calculus.

Recommended power setting: 10-100%.



(it comes with the Ultrasound kit)

#### Insert N° 10-P "Universal"

- Tip 10-P is used for lingual and buccal supragingival scaling. It's one of the most popular Tips and is recommended for the removal of heavy calculus.

Recommended power setting: 10-70%.



(it comes with the Ultrasound kit)

#### Insert N° H-3 "Universal"

- Tip H-3 was designed for subgingival scaling and can also be used on furcations.

Recommended power setting: 10-70%.



(optional item)

### Endodontia

#### Insert N° ET-20 "Preparation of canal"

- Tip ET-20 is used in the pulp chamber for removing pulp stones, dentin and old fillings. Length: 17 mm.

Recommended power setting: 10-25%.



(optional item)

## OPERATION OF EQUIPMENT

### Technical and applications

#### **Insert N° ET-40 "Preparation of canal"**

- Tip ET-40 is used in the coronal and apical part of root canals. Among other things the tip can be used to remove posts, widen calcified canals and remove hard fillings. Length: 24 mm.

Recommended power setting: 10-15%.

#### **Inserto N° S-04 "Preparo do canal"**

- Tip S-04 is made of titanium and has no diamond coating. Its primary area of use is the isolation and removal of broken instruments. Length: 24 mm.

Recommended power setting: 10-15%.

#### **Insert N° S12-90 "Apical surgery"**

- Tip S12-90 is angled at 110° and is used in combination with the instrument holders A-120 and A-90. With the aid of the instrument holder, the S12-90 can be precisely positioned at the angle needed for the treatment.

Recommended power setting: 10-50%.

#### **Insert N° P-14 "Apical surgery"**

- Tip P-14 is angled at 100° and it's also used in combination with the instrument holders A-120 and A-90. It has a slimmer design and is therefore better suited for small roots.

Recommended power setting: 10-50%.

#### **Insert N° A-120 "Removal of broken instruments"**

- Tip A-120 is a holder for files and instruments with a diameter of 0.8 mm. It can be used with implant tips and AP tips. A-120 has an angle of 120°.

Recommended power setting: 10-50%.

#### **Insert N° A-90 "Removal of broken instruments"**

- Tip A-90 is a holder for files and instruments with a diameter of 0.8 mm. It can be used with implant tips and AP tips. It has an angle of 90°.

Recommended power setting: 10-50%.

### Dentistry and Prosthesis

#### **Insert N° 5-AE "Removal of posts and crowns"**

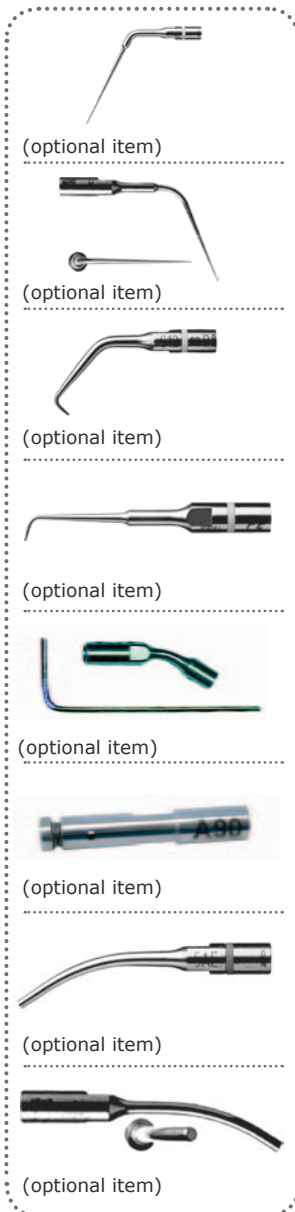
- Tip 5-AE is used for removing crowns and inlays. Its small diameter enables access to difficult-to-reach areas.

Recommended power setting: 10-100%.

#### **Insert N° 6-A "Amalgam condensation"**

- Tip 6-A is used for amalgam condensation.

Recommended power setting: 10-50%.



## OPERATION OF EQUIPMENT

### Activation of Bicarbonate jet

Bicarbonate jet removes dark stains from teeth, caused by tobacco, coffee, tea, etc. related to plaque. In order to obtain better results of its use, we recommend a distance of 5mm between the handpiece and the teeth, with an angle from 30 to 45°, describing circular movements over the teeth.

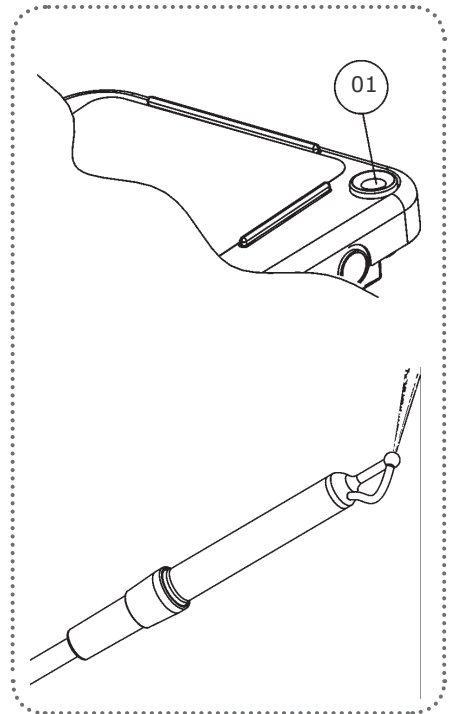
The bicarbonate jet must be directed to the occlusal edge and not to the gingival edge in order to avoid an unpleasant sensation to the patient.

Remove the upper lid (01), add 20 to 40 sodium bicarbonate, this quantity is enough to meet prophylaxis needs.

#### ATTENTION

In order to avoid clogging, don't add more than 40g of bicarbonate. Bicarbonate level can be checked through the transparent lid.

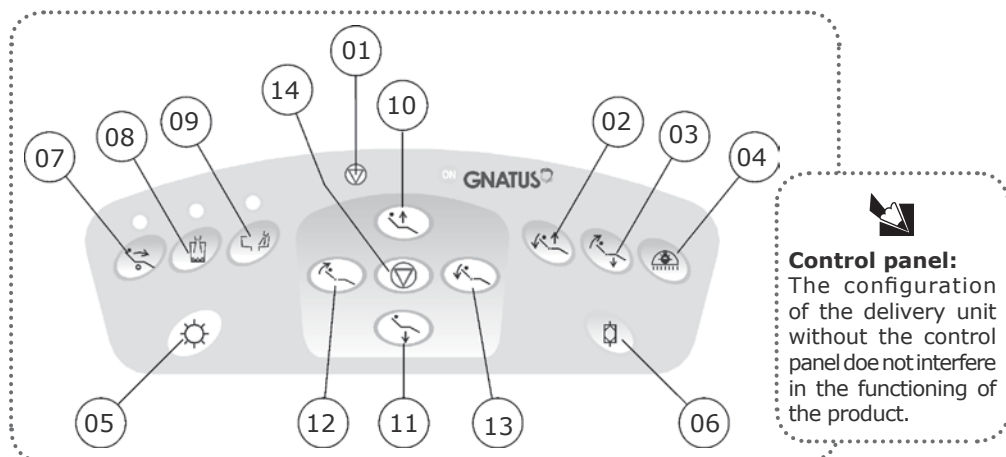
To adjust the bicarbonate jet power, use the selector (12) pag.08; to increase pressure, turn it clockwise, to decrease, counterclockwise.



- The efficacy depends on the perfect dosage of the volume of water and quantity of powder.
- The quantity of water in excess will cause a reduction in the effect of the powder, due to the washing.
- Reducing the water too much will make the powder more aggressive.

## OPERATION OF EQUIPMENT

### Equipment activation by the delivery unit panel



- |  |                        |
|--|------------------------|
| 01 - LED of emergency                  | 08 - Cup filling       |
| 02 - It determines the work position   | 09 - Bowl's water flow |
| 03 - Zero position                     | 10 - Lift seat         |
| 04 - Dental light operation            | 11 - Lower seat        |
| 05 - X ray view operation              | 12 - Lift backrest     |
| 06 - Bio-System operation (optional)   | 13 - Lower backrest    |
| 07 - Last position / Spitting position | 14 - Emergency stop    |

#### Warning:

To preset the cup filling time, press the "Cup filling" key (08) for 3 seconds (a long beep will be heard and the LED will keep blinking).

When the desired time is reached, press the "Cup filling" key again. The cup filling time is then set.

To preset the bowl's water flow, press the "Bowl water" key (09) for 3 seconds (a long beep will be heard and the LED will keep blinking).

When the desired time is reached, press the "Bowl water" key again. The cup filling time is then set.

The "Cup filling" and "Bowl water" time functions have a limited preset flow time, 1 minute for the cup filling and 4 minutes for the bowl's water flow.

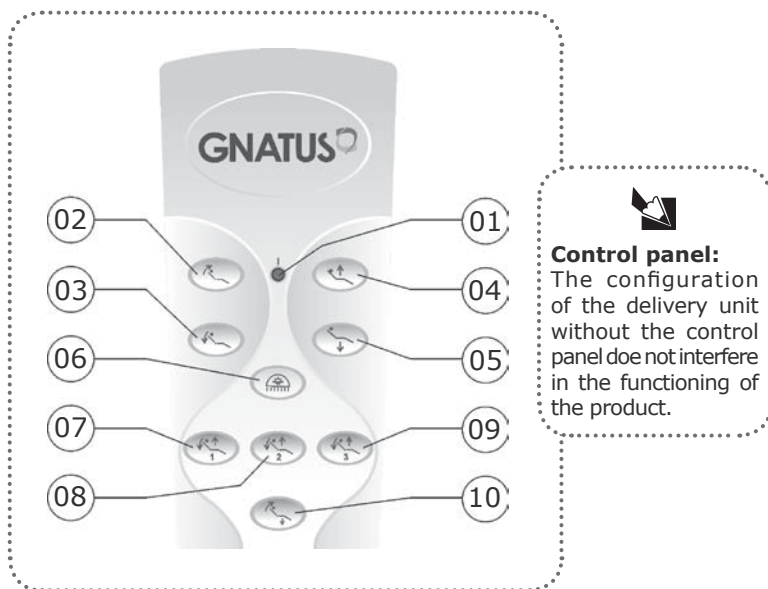
When the key "Last position/Spitting position" (07) is pressed, the dental light will go off (if it was on), the bowl will drain (for the preset time, and if it was not programmed yet, for four minutes) and the backrest will go up to the spitting position. When pressed again, the backrest will return to the last position and the dental light will go on (if it was on).

After pressing the "Last position/spitting position" key (07), any other operation will trigger the "Stop", and automatically the backrest current position will be defined as "Last position".

When the "Emergency stop" (14) key is pressed, the LED (01) will be on and all chair movements are interrupted until pressed again (14).

## OPERATION OF EQUIPMENT

### Drive through the Control Panel Kit (optional)



01 - Indication LED on

02 - Backrest up

03 - backrest down

04 - Seat up

05 - Seat down

06 - Reflector actuation

07 - Determines the working position 1

08 - Determines the working position 2

09 - Determines the working position 3

10 - Determines the position Return to zero

#### Working positions

To program the working positions just put the chair into the position and the reflector in the desired intensity and keep it pressed regarding what working position you want to schedule until a beep sounds.

#### Reflector

To change the brightness, keep the key (06) pressed, the brightness will increase or decrease gradually, according to the reflector specifications (see the reflector manual).

**Attention:** After activated the "Return to zero" operation (10), any other operation could perform the "Stop".

## How to provision the reservoirs

### Water - Syringe / Handpieces

Remove the reservoir (01) uncoiling it on clockwise and make the replacement of water. After the replacement put it back coiling on anticlockwise. Always use filtered water or aseptic products.

## OPERATION OF EQUIPMENT

### Bio-System (Optional)

Remove the reservoir (02) uncoiling it on clockwise and make the replacement. Use a chlorinated water solution 1:500

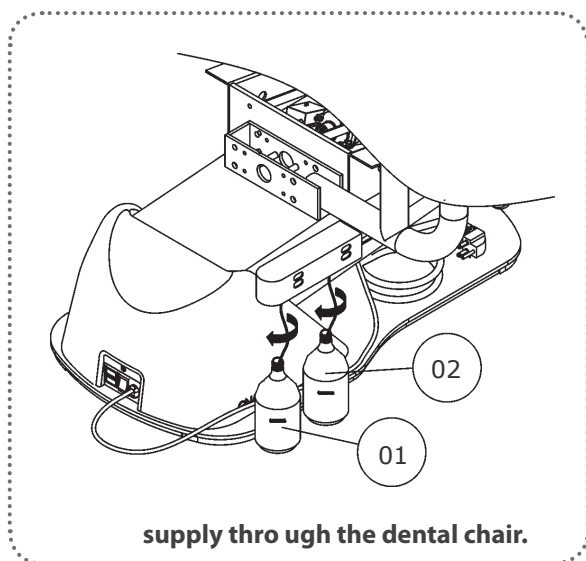
#### Preparing the solution:

From a solution of hypochlorite of sodium at 1% a solution of chlorine at 500 p.p.m. is prepared.

**How to prepare the solution:** Take 25ml of hypochlorite of sodium at 1% and dilute it in 500 ml of water (1 to 20). Such solution should be prepared daily.

#### IMPORTANT:

Follow this proportion strictly to avoid damages in the equipment and to have an efficient result in the disinfection.



## PRECAUTIONS, RESTRICTIONS AND WARNINGS

### Transportation and storage

This equipment must be transported and stored observing the following directions:

- Avoid falls and impacts;
- Keep it dry, do not expose it to rain, water drops or wet floor;
- Keep it away from water and direct sunlight, and in its original wrapping;
- Don't move it over irregular surfaces, protect it from rain and observe the maximum stack quantity specified in the packaging;
- Transportation and storage temperature range: -12°C to 50°C;
- Transportation and storage relative humidity range: 0°C to 90°C;
- Atmospheric pressure range: 500hPa to 1060hPa (375 mmHg to 795 mmHg).



## PRECAUTIONS, RESTRICTIONS AND WARNINGS

### Transportation, storage and operation

This equipment must be transported and stored observing the following directions:

- Avoid falls and impacts;
- Keep it dry, do not expose it to rain, water drops or wet floor;
- Keep it away from water and direct sunlight, and in its original wrapping;
- Don't move it over irregular surfaces, protect it from rain and observe the maximum stack quantity specified in the packaging;
- Transportation and storage temperature range: -12°C to 50°C.
- Ambient temperature range recommended by Gnatus +10 ° C to +35 ° C.

### Sensitivity to environmental conditions in normal situations of use

- The equipment has been planned not to be sensitive to interference such as magnetic fields, external electrical factors, electrostatic discharge, pressure or variance of pressure, provided that the equipment is installed, maintained, clean, preserved, transported and operated as per this instruction for use.

### Precautions and warnings “during the installation” of equipment

- The equipment should only be installed by Gnatus authorized technical assistance or technicians.
- Check that the socket in which the device will be connected has a ground connection. According to the ABNT standard, this is essential for the safe operation of the system;
- Position the unit in a place where it will not get wet.
- Install the unit in a place where it will not be damaged by the pressure, temperature, humidity, direct sunlight, dust, salts, or sulfur compounds.
- The unit should not be submitted to inclination, excessive vibrations, or blows (including during transportation and handling).
- This equipment was not planned for use in an environment where vapors, anesthetic mixtures inflammable with air, or oxygen and nitrous oxide can be detected.
- Check the voltage of the equipment at the moment of executing the electrical installation.
- The equipment must be grounded correctly.
- Before the first use and/or after long interruptions from work such as vacations, clean and disinfect the equipment; eliminate air and water deposited in the internal hoses.



**These information also make part of the Manual of Installation and Maintenance of the equipment that can be found with the authorized Gnatus technician.**

### Recommendations for the dental equipment maintenance.

Your Gnatus equipment has been designed and developed according to the standards of modern technology. Similarly to other kinds of equipment, it requires special care, which is many times neglected due to several reasons and circumstances.

Therefore, here are some important reminders for your daily routine. Try to follow these simple rules, which will save you a lot of time and will avoid unnecessary expenses once they start making part of your working procedure.

# PRECAUTIONS, RESTRICTIONS AND WARNINGS

## Precautions and warnings “during the use” of equipment

- The equipment should only be operated by duly enabled and trained technicians (Dental Surgeons, Capacitated Professionals)
- If any maintenance should be required, only use services of the Gnatus Authorized Technical Assistance.
- The equipment has been manufactured to handle both continuous and intermittent operation; so follow the cycles described in these Instructions for Use.
- Although this equipment has been planned in accordance with the standards of electromagnetic compatibility, it can, in very extreme conditions, cause interference with other equipment. Do not use this equipment together with other devices very sensitive to interference or with devices which create high electromagnetic disturbance.
- Do not expose the plastic parts to contact with chemical substances, use in the routines of dental treatment, such as: acids, mercury, acrylic liquids, amalgams, etc.

### **Ultrasound:**

- The use of the Ultrasound is not advisable for patients and dental surgeons using pacemakers.

### **Bicarbonate Jet:**

- It is not advisable to use this equipment in patients who have serious renal or respiratory alterations, or who undergo hemodialysis. These cases should be followed by a doctor.
  - We recommend the use of a mask and goggles for applying the bicarbonate jet.
  - Avoid leaving sodium bicarbonate in the container for long periods without use.
- The effect of residual humidity in the air may alter the properties of the powder and cause blocking.

### **Gnatus shall not be responsible for:**

- Use of the equipment differing from that for which it is intended.
- Damages caused to the equipment, the professional and/or the patient by the incorrect installation and erroneous procedures of maintenance, differing from those described in these Instructions for use which come with the equipment or by the incorrect operation of it.

## Precautions and warnings “after” the use of equipment

- Turn off the main switch of the dental set when it is not in use for an extended period of time.
- Always maintain the equipment clean for the next operation.
- Do not modify any part of the equipment. Do not disconnect the cable or other connections without need.
- After using the equipment, clean and disinfect all the parts which may be in contact with the patient.
- Upon noticing irremovable stains, splits or cracks in the light conductor or in the eye protector, replace the damaged components.

## Precautions and warnings during the “cleaning and disinfection” of equipment

### **Delivery Unit:**

- Before cleaning the equipment, turn off the main switch.
- Avoid spilling water, even accidentally, or other liquids inside the equipment, which

## PRECAUTIONS, RESTRICTIONS AND WARNINGS

could cause short circuits.

- Do not use microabrasive material or steel wool when cleaning, or employ organic solvents or detergents which contain solvents such as ether, stain remover, gasoline etc.

### **Curring Light:**

- The equipment and the light conductor cannot be placed in the oven or autoclaves.
- The conductor can't be immersed in solvents or substances that contain acetone in its composition.
- Avoid the light conductor to terminal to touch the resin to be polymerized.
- When using the Curring Light check if the light conductor output doesn't have residues that might obstruct the light beam.

### **Ultra-som:**

- After use, remove the insert to avoid damage.
- The part should be packaged duly clean.
- Do not sterilize the transducer in contact with other types of material.
- The inserts should be cleaned beforehand eliminating all the resin residue.
- After removing the insert from the transducer, it should be disinfected with surgical spirit and taken to be sterilized in autoclave.
- Before placing or removing the cover of the transducer, it is advisable first to remove the insert from the transducer, in order to avoid any damage to the cover.
- Never expose the covers of the transducer to any type of oil, as this may modify the structure of the material, jeopardizing its useful life.

### **Bicarbonate Jet:**

- Before the sterilization procedure, the part should be packed duly clean.
- Do not sterilize the part in contact with other types of material.
- Before the sterilization procedure, remove the hose from the nozzle of the sodium bicarbonate jet handpiece, as it is not autoclavable.

### **Hand Laser:**

For further information, please see the Jet Hand manual which comes with the product.

## **Precautions in case of alteration in the functioning of equipment**

- If the equipment has any abnormality, check if the problem is related to any item listed in the topic of unforeseen events (failures, causes and solutions). If it is not possible to resolve the problem, turn off the equipment, remove the power supply cable from the socket and contact your representative (Gnatus).

## **Precautions to be adopted against foreseeable or uncommon risks, related to the deactivation and abandoning of equipment**

In order to avoid environmental contamination or undue use of the Equipment after it has become useless, it should be discarded in the suitable place (as per the local legislation of the country).

- Pay attention to the local legislation of the country for the conditions of installation and disposal of residue.

# CORRECTIVE AND PREVENTIVE MAINTENANCE AND PRESERVATION

## Additional procedures for reuse

The equipment can be reused in undetermined, i.e. unlimited, quantities, only needing to be cleaned and disinfected.

## Disinfection

Use clean and soft cloth dampened in alcohol 70% to disinfection of the equipment.  
Never use corrosive disinfectants or solvents.

## Cleaning



**The cleaning procedure below should be executed at the start of the working day and after each patient.**  
**Always turn off the main switch before executing the procedures of daily maintenance.**

To clean the equipment, we recommend the use of "BactSpray (Reg nº MS: 3.2079.0041.001-5) or any other similar product:

**Active component:** Benzalkonium chloride (tri-quaternary ammonium)

Solution 50%..... 0.329%

**Chemical composition:** Butyl Glycol, Decyl polyglucose, Sodium Benzoate, Sodium Nitrate, Essence, Deodorized Propane / Butane, demineralized Water.

For more information concerning cleaning procedures, see manufacturer's instructions.

### WARNING:

- In order to prevent risks and damages to equipment, make sure that the liquid does not enter into the unit.
- The application of other solvent-based cleaning products or sodium hypochloride isn't recommended, because they may damage the equipment.



**NOTE:** The registration at the Ministry of Health of the "BactSpray" is executed separately from the product described in this manual, as the "BactSpray" is not manufactured by Gnatus.



**Note: Use gloves and other systems of protection, during the disinfection.**

# CORRECTIVE AND PREVENTIVE MAINTENANCE AND PRESERVATION

## Cleaning Curring Light

The light conductor cleaning and the optical protector must be done using only neutral soap and cotton. To the exterior of the pen use neutral soap or alcohol 70% vol.

Never use any other chemical based product than previous mentioned, because along the time these products attack the surface of the instrument.

Never immerse the instrument in disinfection baths.

## Ultrasound / Bicarbonate Jet

The equipment is reusable in undetermined, i.e. unlimited, quantities, only requiring cleaning and disinfection.

### Cleaning of the terminal, transducer cover and hose:

We recommend using a clean cloth, moistened with water and neutral soap.

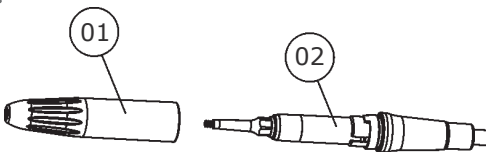
### Cleaning of the bicarbonate container:

Locate the bicarbonate container (item 08 page 8) through the side access, remove it rotating it in a clockwise direction and clean it with a dry cloth. Check that the thread has absolutely no powder in it, and replace it, rotating it in a counterclockwise direction.

### Autoclavable:

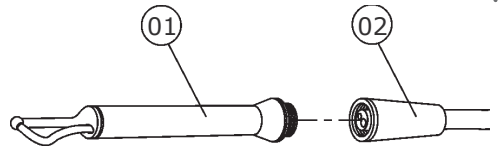
Transducer cover, inserts and wrench are autoclavable in the following conditions:

- Maximum temperature of 134°C.



### Sterilization of the transducer cover:

Remove the insert from the transducer. Carefully remove the cover (01) from the transducer (02) and then take it to be sterilized in autoclave (packaged).



### Sterilization of the Bicarbonate Jet:

Remove the adapter (02) from the jet of bicarbonate point (01) uncoiling it anti-clockwise and take the jet of bicarbonate point for sterilization in auto-key (loaded).



### Recommendations for sterilization in autoclave:

- The piece must be wrapped clean.
- Don't sterilize the transducer cover in contact with other materials.
- The insert should be cleaned before eliminated all the resin residues.
- After removing the insert from the transducer, it should be disinfected with surgical spirit and taken for sterilization in autoclave.
- The material of the transducer's cover was specially developed to resist up to 200 cycles of sterilization by autoclave, provided that recommendations mentioned above were observed.

**WARNING:** Never expose the transducer's cover to any kind of oil, because it may modify the material's structure, affecting its useful life.

# CORRECTIVE AND PREVENTIVE MAINTENANCE AND PRESERVATION

## Cleaning

### Unblocking of the bicarbonate Jet

Avoid leaving sodium bicarbonate on the reservoir for long periods without using it. The air humidity could change the powder properties and cause a blockage.

If this happens, proceed as follows: find the bicarbonate container (01), remove it unscrewing it clockwise and, using a dry piece of cloth, clean it. Check the thread is free from powder and put it back screwing it counter-clockwise.

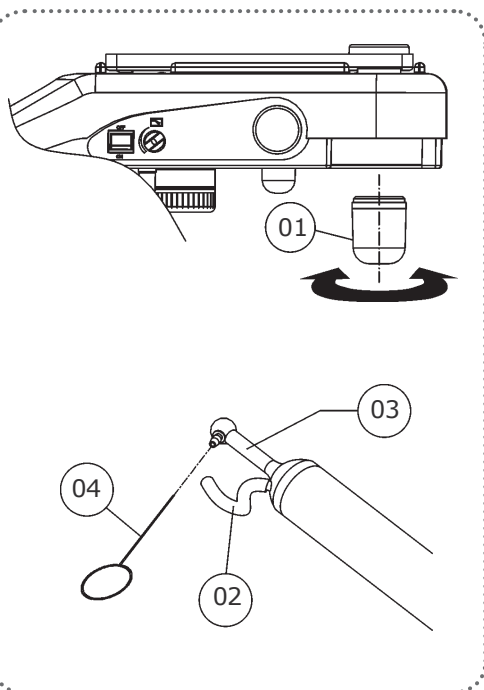
The Delivery Units with bicarbonate jet features an unpressuring, hose and handpiece internal cleaning automatic system.

When pedal is loosed, an internal air jet will clean the system. If the system were clogged, proceed as follows:

a) Withdraw hose (02) from tip (03), aim somewhere safe (cuspidor, sink, etc.) and actuate the pedal in order to check if the tip is clogged (03).

b) Clean orifice with an auger (04), getting it in and out many times.

c) Put the hose back (02) on tip (03). If it was necessary, replace the hose (02).



## Hand Laser

For further information, please see the Hand Laser manual which comes with the product.

# CORRECTIVE AND PREVENTIVE MAINTENANCE AND PRESERVATION

## Cleaning

### Bio-System (optional)

Remove hanpieces from terminals. Take terminals to bowl or water unit's sink.

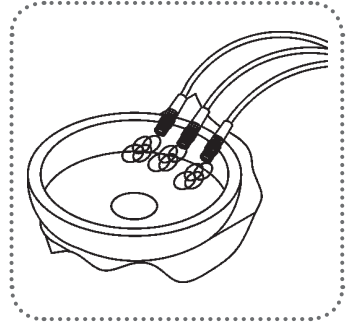
Open the terminal's spray valves completely.

Press the Bio-system key (06), which is located in the command panel, for some seconds, to disinfect the equipment's components internally with disinfectant.

Then, press the command pedal for some seconds to rinse, in order to eliminate the disinfectant residues that could have remained.

#### IMPORTANT:

Repeat this procedure before working day and after each patient.

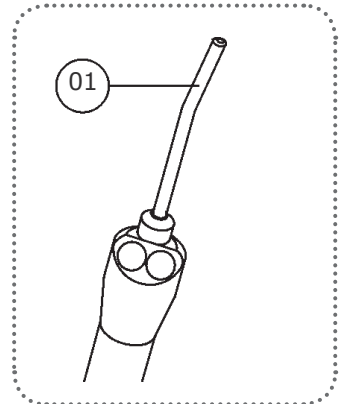


## Reservoirs

It's highly recommended the cleaning of the water reservoirs, using chlorinated water solution 1:500 (as described previously).

## Triple syringe

Only the syringe tip is autoclavable (01). The other pieces must be cleaned using a piece of cotton wool and alcohol 70% vol. Never use a hot air sterilizer.



## Preventive Maintenance

The equipment should be calibrated routinely, as per the legislation in force in the country.

But never with a period exceeding 3 years.

In order to protect your equipment, seek Gnatus technical assistance for periodic revisions of preventive maintenance.

## Corrective Maintenance

If the equipment has any abnormality, check if the problem is related to any of the items listed in the item Unforeseen Events (situation, cause and solution).

If it is not possible to solve the problem, turn off the equipment, and request Gnatus technical assistance.

## UNFORESEEN EVENTS – SOLUTION OF PROBLEMS

**!** Upon coming across any problem in operation, follow the instructions below to check and repair the problem, and/or get in touch with your representative.

Problem	Probable cause	Solution
<b>Delivery Unit</b>		
-Handpiece is not working.	-Compressor disconnected.	-Plug the compressor in.
-Handpiece with low speed.	-Inlet pressure below specified (80 PSI).	-Adjust inlet pressure (80 PSI).
-No water from syringe.	-Reservoir run out of water. -Compressor disconnected.	-Put filtered water in reservoir. -Plug compressor in.
-When Bio-system is operated no disinfectant come from handpiece terminals.	-Bio-system reservoir run out of water. -Chair fuse burned. -Main or chair switch is off	-Put disinfectant in the reservoir. -Replace chair fuse. -Switch main/chair switch on.
- X ray view does not work	-Chair's fuse burned -Main or chair switch is off.	-Replace chair's fuse -Switch main/ chair switch on.
<b>Curring Light</b>		
-Equipment's not working.	-Power cut. -Chair's fuse burned.	-Check power supply. -Replace chair's fuse.
-Equipment is not polymerizing resins.	-Resin is not appropriate for LEDs photopolymerizer wave length range.	-Get the indicated resin for the photopolymerizer's wave length range, one with contains photoinitiators based on camphorquinone.
<b>Ultrasound</b>		
-The equipment doesn't work.	-Burned fuse.	-Change the plug.
-Lack of power to the ultrasound.	-Deformed insert. -Loosen insert. -Bad utilization (incorrect attack angle).	-Change the insert. -Hold the insert with the key -See item "Technical and applications".
-There is no water in the hand piece.	-Inadequate alimentation pressure water. -Bad regulating of the water flux.	-Correct the water filter. -Adjust the water flux through the actuator.



## UNFORESEEN EVENTS – SOLUTION OF PROBLEMS

**!** Upon coming across any problem in operation, follow the instructions below to check and repair the problem, and/or get in touch with your representative.

Problem	Probable cause	Solution
<b>Bicarbonate Jet</b> - Not enough bicarbonate in jet.	-Lack of bicarbonate in reservoir. -Spout or reservoir outlet is clogged. -Bicarbonate excess in reservoir. -Wrong jet position.	-Add bicarbonate to reservoir (max. 40g). -Clean clogged parts -Remove excess. -Change position
-Low pressure in jet.	-Compressor disconnected	-Plug compressor in
-Few water in jet.	-Water valve is closed. -Jet water reservoir is empty.	-Open valve. -Put water in reservoir.

## WARRANTY OF EQUIPMENT

This equipment is covered by the warranty terms counting from the date of installation, as specified below; provided that the defect has occurred in normal conditions of use and that the equipment has not remained stored for more than 06 months counting from the issue date of the sales document until the date of the actual installation.

- WARRANTY TERMS: 24 months;

- LOSS OF THE WARRANTY:

A) Attempt to repair using an inadequate tool or by unauthorized technicians;

B) Installation of the equipment by an unauthorized technician;

C) Damage arising from inappropriate storage or signs of infringement;

D) Incorrect use of the equipment;

E) Use of a cleaning product not indicated by the factory;

F) Falls or blows which the equipment may undergo or lack of observation of an compliance with the guidelines of the Owner's Manual, which was delivered with the present document, together with the equipment. Repair or replacement of parts during the warranty period shall not extend the validity term of their warranty.

- This warranty does not exempt the customer from paying the service charge for the visit and the travel expenses of the technician, except when the customer sends the equipment to execute the maintenance inside the establishment of the technical assistance.

"Consumer Defense Code - art. 50, unique paragraph".

- The Warranty Certificate comes with the product and must be filled in upon the date of installation by the Gnatius Authorized Technician.

- Queries and information: GNATUS Help Desk (+55) 16 2102-5000.

- Check the warranty term attached to this manual.

## FINAL CONSIDERATIONS

The most important aspect related to equipment care is that concerning spare parts.

To guarantee the life span of your equipment, use only ***original Gnatus spare parts***. They are sure to follow the technical specifications and standards required by Gnatus.

We must also point out to you our chain of authorized dealers. Only dealers that make part of this chain will be able to keep your equipment constantly new for they count on technical assistants who have been trained and on specific tools for the correct maintenance of your equipment.

Doubts and information: GNATUS Call center (55-16) 2102-5000.





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