

POST-CURING UNIT

PHOTOPOL SMART



USER AND MAINTENANCE MANUAL



PHOTOPOL

1. DESCRIPTION

1.1 PURPOSE OF USE

PHOTOPOL “SMART” has been expressly designed to carry out curing operations under the effect of ultraviolet rays. The system has been developed to suit with the requirements of Dental, Jewellery and Rapid Prototyping laboratories for the hardening (post-curing) process of objects manufactured with 3D DLP printers which use liquid resins and for the final stabilisation of photosensitive composites. The UV spectrum range achieved by this unit corresponds to the specific value of those resins (from 320 to 450nm) thus assuring to reach the complete result.

The curing process of **PHOTOPOL Smart** is performed in a wide working chamber, the radiation sources have been uniformly distributed on all walls assuring to reach the objects from any direction.

All functions are controlled by an electronic microprocessor circuit. The operating software features a logical user interface providing ease of use and immediate understanding. All operating data are always clearly displayed and can be easily entered on the display integrated in the lid.

The unit works under independent condition, it may not be supervised by the User himself therefore no defined working place is required.

1.2 IMPROPER USE

Do not use the UV radiation performed by this unit for any different purposes of use not herewith stated; the manufacturer will assume no liability further to improper use of the unit for any damage which could incur to persons, animals or things.

2. TECHNICAL SPECIFICATIONS

Width	450 mm (500 with the connections)
Depth at the base	360 mm
Height	215 mm
Net Weight	10,4 kg
Gross Weight	12,4 kg
Rated voltage	230VAC +/-10% – 50/60 Hz
Delayed effect fuses	2 ø 5x20 - 3.15 Amp
Absorption	150 W – 0.75 Amp
Altitude	Up to 2000m slm
Operating temperature	from 10 to 40°C
Humidity (for storage, too)	from 20 to 80%
Storage temperature	from -10 to +70°C
Protection level	IP42
Acoustic pressure LAeq, Tp	<70 dB(A)
Pure UV LED (violet)	6 circuits à 16 LED
Chamber useful size	250 x 250 x 120h

3. TECHNICAL REFERENCE GUIDELINES AND TEST REGULATIONS

The light-curing furnace is mass-manufactured by DENTALFARM in compliance with technical and safety rules in force, as provided for by the 2006/42 EEC Community Directive on machinery and following amendments and integrations. PHOTOPOL Digital complies with the Directives EMC 2014/30/EU and LVD 2014/35/EU.

Careful inspection and full routine testing is carried out singularly on each machine which is further tested by an automatic test installation (Chauvin Arnoux C.A 6155) carrying out in sequence several tests and it prints a report assuring compliance with the fixed limits.

According to International Regulations, this unit has been classified as AEE (electric and electronic device, whose correct operation depends on electric currents and electromagnetic fields) and as a consequence, at the end of its lifetime, it can not be treated as normal waste material but it must be disposed separately, complying with the Directive 2012/19/UE.



4. GENERAL PRECAUTIONS

- Read carefully the present manual before carrying out any starting, operating or maintenance operation on the machine
- The final User of the machine is an adult, skilled and well trained professional on the specific curing process and risks involved and not merely an occasional worker
- Safety of the User depends on the skillness, on the good sense and on the caution when using the machine; for this reason, it is of utmost importance to know in detail the allocation and the function of all the controls
- During the transport and the following storage do not turn the unit upside down and conform to the directions printed on the box
- In consideration of low weight of the unit, handling operations can be carried out by a single Operator
- Do not install and do not use the machine in potentially explosive areas
- The assembly components do not have any contraindication for persons with implantable active or passive devices, in any case we recommend to contact beforehand your Doctor
- Do not tamper the electrical wiring system of the machine
- The built-in safety mechanisms and the warning labels of the machine shall in no way be removed or modified
- Check regularly all the parts which tend to wear out easily due to their specific working conditions
- Check regularly that the feeding cable and most specifically the ground connections are intact and not damaged
- Do not allow unauthorized persons to try to repair the machine
- No modification to this unit is allowed unless previously authorised
- Should any inconvenience or malfunction occur, pls contact our Technical Servicing
- Residual risks: on the unit some warning or precaution symbols are affixed you will have to comply with according to their meaning as follows

Risk of misunderstanding	Risks deriving from the exposure to the UV rays and from materials handling		Electrical hazards	Risk of burning
				
Read through the User Manual for any information and to restrict any risk	Wear goggles as protection against UV radiation which may harm your eyes		Parts under tension, do not remove the protections	Presence of hot surfaces
	Wear safety gloves in case of hypersensitivity in resin handling			

5. INSTALLATION INSTRUCTIONS

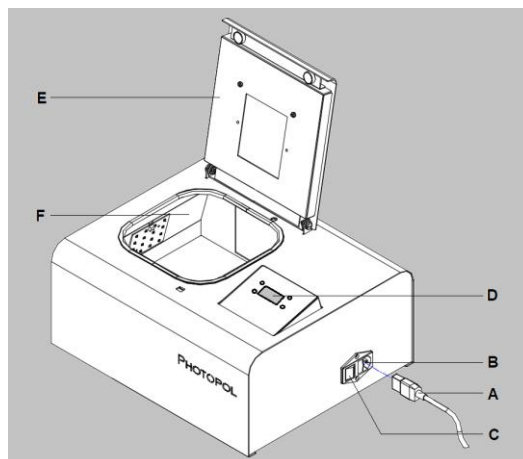
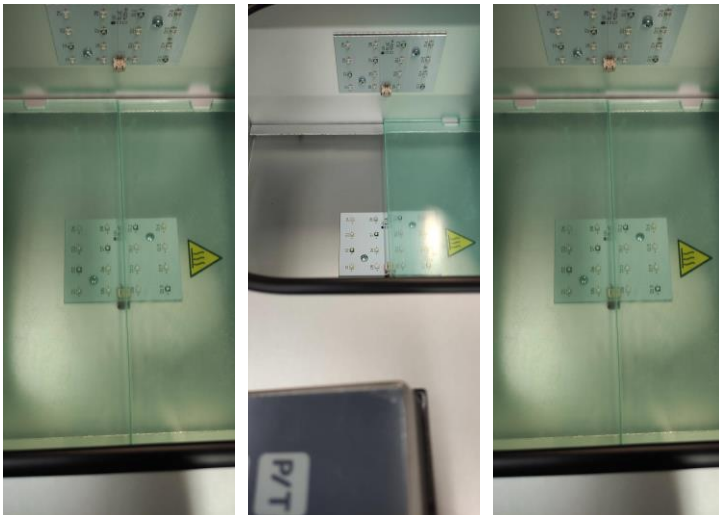
/!\ ATTENTION

Installation of this machine is quite easy but it must be carried out paying utmost attention in order to avoid any mistake which may originate problems during operation, inconvenience or even damages.

Store the original package of the unit for any further handling or shipment under extraordinary maintenance intervention. Remove the protective foils all around the metallic housing and inside the transparent shelves positioned at the inside of the working chamber.

1. Place the machine on a suitable work bench, in a stable position appropriate to its weight, at least 10cm away from the wall to allow the necessary space for the connections. During operation no vibrations are originated, therefore no additional precautions are required at installation
2. Check the plate data, referring to the electrical feeding and the absorption then feed the unit through a protected line by 10Amp magneto-thermic bipolar switch and circuit breaker with 30mA sensibility (devices not part of the supply)
3. Connect the feeding cable (A) to the socket (B) placed on the right side panel and plug the other end into an approved 230v AC - 50Hz socket with ground connection
4. Switch on the unit (C), the display (D) will light up.
5. Insert the two transparent shelves (11 on page 9) supplied (first one then the other then paired), first removing the protective film, then positioning the side without recess in the center of the chamber towards the controls and then lowering the opposite side, (with recess), centering on the power cable connector of the LED board located on the left side.

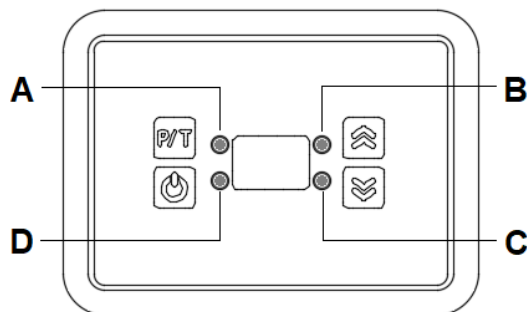
Below the assembly steps:



- A = Electric cable
- B = Feeding plug
- C = Main switch
- D = Display with keyboard
- E = Tilting lid
- F = Radiation chamber

6. DESCRIPTION OF THE WORKING FUNCTIONS

The functions of the unit can be selected and set by means of the front panel. The software will show the available options for the different parameters to execute the working cycle and the key to be pressed to activate the cycle.



A – power and time selection key

B – value increase key

C – value decrease key

D – start up key

7. INSTRUCTIONS FOR USE

We recommend to wear always the personal protection devices (anti-UV goggles and gloves)

1. Switch on the main switch placed on the right side panel, the display will light up and the machine is ready to input the operating data.
2. By pressing the **P/T** (A) key, the letter P will appear followed by a digit – if necessary decrease or increase the value by means of the “**Arrow Up**” (B) or “**Arrow Down**” (C) keys; the **P9** value indicates the highest **Power** (100%), whereas **P1** states for the minimum value (50%).
3. By pressing again the **P/T** (A) key, the data referred to the “Power” is stored and the software turns to the “Time” parameter shown with a digit expressed in minutes. In this case too it is possible to decrease or increase the values by means of the “**Arrow Up**” (B) or “**Arrow Down**” (C) keys. Highest setting is **99** minutes.



4. Once the required data have been entered, open the lid to access the inside of the working chamber to position the objects to be treated, then close the lid.
5. Press the start up key (D).

If the lid is opened the cycle will be immediately interrupted and **it will NOT restart** when the lid is closed. A new start up is thus required.

At the end of the preset cycles, the display will show again the digit “00” as confirmation for the end cycle.

No acoustic signal will be emitted.

In case of voltage drop during the cycle, it will cause it to stop permanently and CAN NOT be recovered.

It is recommended to protect the unit with an Uninterrupted Power Supply to avoid wasting the objects as a result of an incomplete treatment.

8. MAINTENANCE

 <u>ATTENTION:</u>	Before carrying out any maintenance operation inside the machine, unplug the electric cable from the socket; in such a way the machine will be completely insulated from the electric wiring system. If you still have any doubts, difficulties or any possibility of mistake, contact our Technical Service to avoid any risks or damages. Any technical intervention involving to remove the protections and to manipulate the machine internal components can be carried out exclusively by skilled personnel or staff trained by the Manufacturer.
---	---

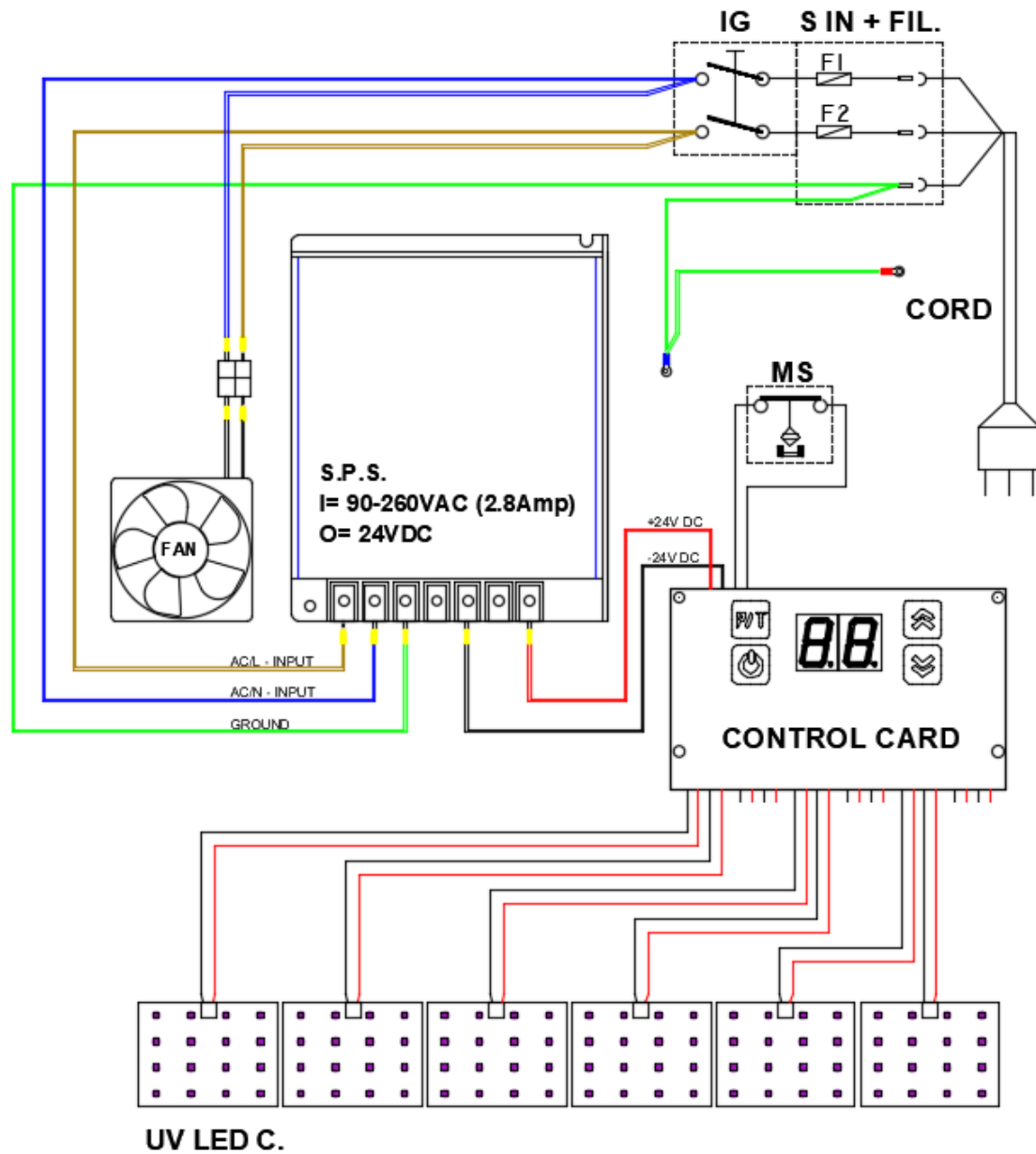
Cleaning of the working chamber

It is advisable to keep always clean the internal surfaces of the working chamber to allow the correct refraction of the emitted rays; be careful to use exclusively non-aggressive liquid detergent specific for glass and PMMA (absolutely with neither abrasive components nor alcohol).

Cleaning and replacement of the internal shelves

In case the internal shelves shall be removed or replaced pay attention not to hit the connector of the LED circuit on the wall. Seize the shelf with your both hands and slightly bend it to allow to overcome the obstacle. Use exclusively genuine spare-parts which permit the correct UV rays to pass through.

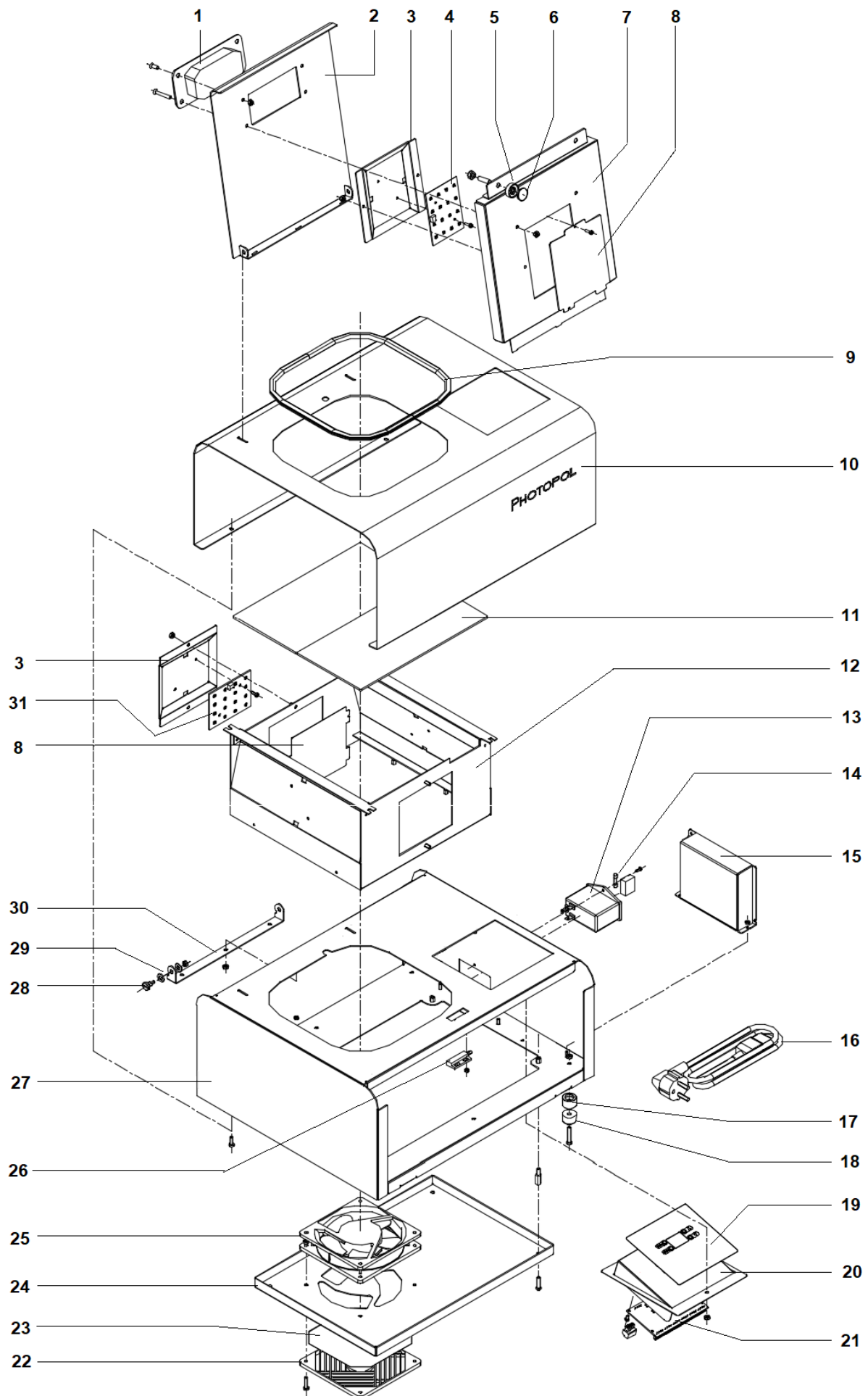
9. WIRING DIAGRAM



Symbol	Description
CORD	Separate electric cord (single-phase with protective conductor)
S-IN + FIL.	Plug, mains filter and fuse-holder
F1/F2	5x20 3.15Amp. delayed fuse
IG	Main switch
S.P.S.	100-260VAC – 36VDC switching power supply
CONTROL CARD	Power board
UV LED C.	16 LED circuits
MS	Lid microswitch
FAN	Cooling fan

10. EXPLODED VIEW AND SPARE-PARTS LIST PHOTOPOL SMART (A5408S)

POS.	CODE	DESCRIZIONE	DESCRIPTION
1	NVT193	MANIGLIA SPORTELLLO	LID HANDLE
2	5408054B	SPORTELLLO SUPERIORE	UPPER LID
3	5408056	SUPPORTO CIRCUITO LED	LED CIRCUIT SUPPORT
4	5408200	CIRCUITO 16 LED UV (VIOLETTO)	16 UV LEDs CIRCUIT (VIOLET)
5	5408031	ISOLANTE PER MAGNETE	MAGNET GUIDE
6	NEC043	UNITA' MAGNETICA CILINDRICA	MAGNETIC UNIT
7	5408054A	SPORTELLLO INFERIORE	LOWER LID
8	5408063	RIPARO SU SUPPORTO CIRCUITO LED	PANEL ON LED CIRCUIT SUPPORT
9	NVG034	PROFILO A “U” IN GOMMA	“U” RUBBER PROFILE
10	5408052	COPERCHIO ESTERNO ALLUMINIO SATINATO	SATIN FINISHED ALUMINUM COVER
11	5408057	RIPIANO INTERNO CAMERA	CHAMBER INSIDE SHELF
12	5408051	CAMERA DI IRRAGGIAMENTO	RADIATION CHAMBER
13	NEC131I	GRUPPO SPINA, FILTRO, PORTAFUS. & INTER.	SET OF PLUG, FILTER, FUSE HOLDER & SWITCH
14	NEA070	FUSIBILE D.=5x20 – 3.15 A	FUSE D.=5x20 – 3.15 A
15	NES105	ALIMENTATORE SWITCHING GENERALE	MAIN SWITCHING POWER SUPPLY
16	NEV013	CAVO ELETTRICO 3x1 SPINA/PRESA	ELECTRIC CABLE 3x1 PLUG/SOCKET
17	5408066	DISTANZIALE PER PIEDINO	FOOT SUPPORT
18	NVG048	PIEDINO GOMMA H=12	RUBBER FOOT
19	5408071	ETICHETTA QUADRO COMANDI	CONTROL PANEL LABEL
20	5408070	SUPPORTO COMANDI	CONTROL SUPPORT
21	5408210	SCHEDA CONTROLLO	CONTROL BOARD
22	NVT256	PROTEZIONE IN PLASTICA SU VENTOLA	PLASTIC PROTECTION ON FAN
23	NVT255	FILTRO METALLICO SU VENTOLA	METALLIC FILTER ON FAN
24	5408055	CHIUSURA INFERIORE	LOWER CLOSURE
25	NES047	VENTOLA DI RAFFREDDAMENTO	COOLING FAN
26	NEC044	SENSORE MAGNETICO PIATTO	FLAT MAGNETIC SENSOR
27	5408050	CORPO	METAL BODY
28	5408060	VITE ASSEMBLAGGIO SPORTELLLO	LID ASSEMBLY SCREW
29	NVT081	RONDELLA NYLON D.=6mm	D=6mm NYLON WASHER
30	5408053	CERNIERA SPORTELLLO	LID HINGE
31	5408201	CIRCUITO 16 LED NEAR UV (BLUE) optional	16 NEAR UV LEDs CIRCUIT (BLUE) optional



11. CE DECLARATION OF CONFORMITY



DICHIARAZIONE DI CONFORMITA' DECLARATION OF CONFORMITY

Noi sottoscritti,
We, the undersigned,

DENTALFARM S.r.l.

Via Susa, 9/A
10138 TORINO - I
tel. (+39) 011 4346588

dichiariamo sotto la nostra esclusiva responsabilità che il prodotto di ns. fabbricazione
declare under our own responsibility that the product of our exclusive manufacturing

Codice
Code

Tipo
Type

Modello
Model

Matricola
Serial Number

Lotto
Batch

A5408S

**Fotopolimerizzatore
Light-curing unit**

PHOTOPOL SMART

è conforme alle seguenti Direttive e Norme Tecniche:
complies with the following Directives and Technical Standards:

2006/42/CEE - DIRETTIVA MACCHINE - *MACHINERY DIRECTIVE*
2014/35/UE - DIRETTIVA BASSA TENSIONE - *LOW VOLTAGE DIRECTIVE*
2014/30/EU - DIRETTIVA COMPATIBILITÀ ELETTROMAGNETICA - *EMC DIRECTIVE*
2011/65/EU - DIRETTIVA RoHS II - *RoHS II DIRECTIVE*
2012/19/EU - DIRETTIVA SUI RIFIUTI DI APPARECCHIATURE ELETTRICHE ED ELETTRONICHE (RAEE)
DIRECTIVE ON WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE)
- EN 12100:2010
- EN 60204-1:2006 + A1:2009
- EN 60601-1 :2006
- EN 60601-1-2:2015

La persona incaricata di costituire il Fascicolo Tecnico è **Massimo Bertotti**
*The person in charge of creating the technical file is **Massimo Bertotti***

Torino - *Turin,*

Amm. Delegato - *Managing Director*
Laura CATELLA

.....

Dentalfarm s.r.l. - Via Susa, 9/a - 10138 - Torino (Italy)- Tel. (+39) 011 4346588/632 - Fax (+39) 011 4346366
E-mail info@dentalfarm.it - www.dentalfarm.it - Dentalfarm Informa 011 4346348

DENTALFARM s.r.l.

Via Susa, 9/A - 10138 TORINO - ITALY

☎ TECHNICAL-COMMERCIAL SERVICE (+39) 011/4346588

☎ AFTER-SALE SERVICE 011/4346632

☎ FAX 011/ 4346366

E-mail: info@dentalfarm.it

Website: www.dentalfarm.it