



**CHAMBER-HG**

**Before use, please take the time to read this datasheet and make sure you understand all advice and caution of use.**



## User Security

- Do not disassemble or modify the chamber. Doing so may result in fire or electric shock.
- Make sure that the chamber is free of moisture or any liquid. Exposure to water or other liquid may result in fire or electric shock.
- Do not touch the plugs or switches with wet hands. Doing so may result in electric shock.
- Before connecting or disconnecting cables, make sure that the power switch is turned OFF. Failure to do so may result in fire, electric shock, or breakdown in the UV LED lamp. Before moving the chamber, disconnect all cables.
- If an abnormal condition, such as smoking, abnormal heating, abnormal odor, or noise, occurs, stop using the chamber immediately and turn OFF the power switch. Continued use may result in fire or electric shock.
- Do not place the chamber in direct sunlight or in a very humid environment. Doing so may result in fire due to internal temperature rise. Observe the limitations of the operating temperature and humidity.
- Do not install the chamber perpendicularly. Always place the chamber on a stable and flat surface. Not doing so may result in the chamber falling or toppling, which may cause bodily injury or chamber malfunction.
- Do not pile up the chambers. Doing so may result in fire due to internal temperature rise.
- Use a cable manufactured by UWAVE to connect the UV LED lamp. Use irradiators that are suitable for the chamber ratings. Doing so may cause control unit failure.
- Please secure a wiring space to the back panel and respect bending radius of cables. Damaging the cables may result in fire or electric shock.

**Any incorrect use cancels the warranty.**

## Table of contents

<b>User Security</b>	1
<b>Eyes &amp; Skin Safety</b>	3
<b>Legal obligations</b>	4
<b>Possible health damages</b>	4
<b>Protective equipment</b>	5
<b>Technical Overview</b>	8
<b>Mechanical dimensions</b>	9
<b>Names and functions of parts</b>	10
<b>How to use</b>	14



Eyes & Skin Safety



UWAVE products come under the standard DIN EN 62471:2008 which classified sources of optical radiation into risk groups subject to their potential photo biological hazard. Due to the emission of high UV irradiation, our products belong to Risk Group 3 (hazardous even for momentary exposure) therefore special safety measures, detailed in the following, must be observed.



To protect the eyes and skin staff everyone in the area must wear **protective equipment**. Protective **goggles** should comply with the standard EN 170 (Personal eye-protection - Ultraviolet filters - Transmittance requirements and recommended use). The goggles must protect eyes against direct and side irradiation.



Don't look directly at the product's output window because of a risk of becoming blind. Don't expose skin too long without protection to avoid skin burning or cancer.



Due to the high emission power, the area near the LEDs can reach high temperature during operation. Avoid touching directly the product and especially the output window.



**Legal obligations**

Under the law at present, workers' exposure must be lower than the Exposure Limit Value (Directive 2006/25/EC of the European Parliament). Depending on the wavelength of the product and the body part insolated, **Limit Values are summarized in the tables below:**

	Eye	Skin
Wavelength	315 – 400 nm (UVA)	180 – 400 nm (UVA, UVB, UVC)
Exposure Limit Value	10 000 J/m <sup>2</sup>	30 J/m <sup>2</sup>

**Case study with a LED at 365 nm with an Optical Power of 10 mW/cm<sup>2</sup>:**

For the **eyes**, the maximal exposure time ( $\Delta t$ ), the Exposure Limit Value (*ELV*), and the Optical Power (*P*) of a UV product are linked by the formula:

$$\Delta t = \frac{ELV}{P}$$

For **skin**, the Optical Power is normalized by skin's sensitivity factors for each wavelength. The maximal exposure time per day is calculated below:

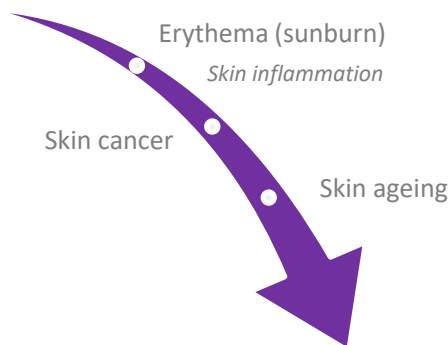
	Eyes	Skin
Optical Power (normalized for skin)	10 mW/cm <sup>2</sup>	4,7 μW/cm <sup>2</sup>
<b>Maximal exposure time per day</b>	<b>1 min 40 s</b>	<b>12 min</b>

With a UV product with an optical power of 10 mW/cm<sup>2</sup>, the Exposure Limit Value per day is **reached in 2 minutes for eyes and 12 minutes for skin** without any safety equipment. Therefore, protective equipment is needed when a UWAVE UV LED equipment is used.



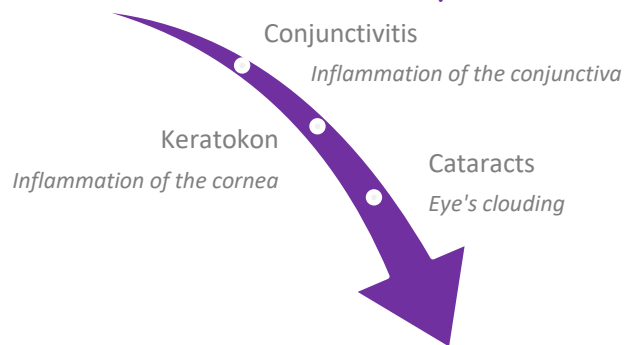
**Possible health damages**

**Effects on skin along unprotected UV exposure**



**Burning, inflammation, chronic diseases**

**Effects on eyes along unprotected UV exposure**



**Visual strain, inflammation, blindness**



## Protective equipment



### Eyes protection



**Safety goggles** prevent UV damages to eyes.

REF: UGLASS-02

- Certified NF EN 170 absorbing 99,9% of UV radiation and visible light up to 532nm
- Protect against side irradiation
- Resist to chemical products and scratches

**Beyond 2 minutes per day of eye UV LED exposure at 10 mW/cm<sup>2</sup>, protective goggles are necessary according to the European Directive 2006/25/EC.**



**Safety face shield** prevents UV damages to eyes and skin's face.

REF: UMASK-01

- Certified NF EN 170 absorbing 99,9% of UV radiation and visible light up to 400nm
- Protect against side irradiation
- Resist to scratches

**Beyond 12 minutes per day of face UV LED exposure at 10 mW/cm<sup>2</sup>, protective mask is necessary according to the European Directive 2006/25/EC.**



## Body protection



**Safety gloves** prevent UV damages to exposed skin.

REF: UGLOVE-01

- High protection against UV radiation
- Resist to chemical products and scratches

**Beyond 12 minutes per day of hands UV LED exposure at 10 mW/cm<sup>2</sup>, protective gloves are necessary according to the European Directive 2006/25/EC.**



**Safety jacket and trousers** prevent UV damages to exposed skin, especially arms & legs.

- Certified UPF 50+ absorbing more than 90% of UV radiation
- Durable and resistant

REF (jacket): UJACK-01

REF (trouser): UTROUS-01

**Beyond 12 minutes per day of arms & legs UV LED exposure at 10 mW/cm<sup>2</sup>, protective clothes are recommended according to the European Directive 2006/25/EC.**



**Protection suit** prevents UV damages to entire body, especially neck.

REF: USUIT-01

- Certified UPF 50+ absorbing more than 90% of UV radiation
- Resist to chemical products

**Beyond 12 minutes per day of neck UV LED exposure at 10 mW/cm<sup>2</sup>, protective suit is recommended according to the European Directive 2006/25/EC.**



## UV source isolation



**UV shields** are protective windows which isolate the UV insulated zone to protect all workers around.

They are made to measure to fit with your constraints.

REF: USHIELD-01

**Beyond 2 minutes per day of eye UV LED exposure and 12 minutes of skin UV exposure at 10 mW/cm<sup>2</sup>, protective shields are necessary to protect staff without safety equipment according to the European Directive 2006/25/EC.**



## Warning stickers



**Warning stickers** inform workers of radiation danger and invite them of wearing protection equipment. They are available in 3 sizes:

- 55 mm x 25 mm
- 165 mm x 75 mm
- 290 mm x 130 mm

REF: USTICK-01

REF: USTICK-02

REF: USTICK-03



## Expertise

Our UV LED experts from UWAVE can come and check your production lines to:



Measure UV irradiance to **determine the maximum UV personal exposure time** compared with limits (European Directive 2006/25/EC).



Determine the most **adapted solution** to protect workers' eyes and skin.









**Contact us to get our expertise. We will find together the equipment which fits with your application.**



## Technical Overview

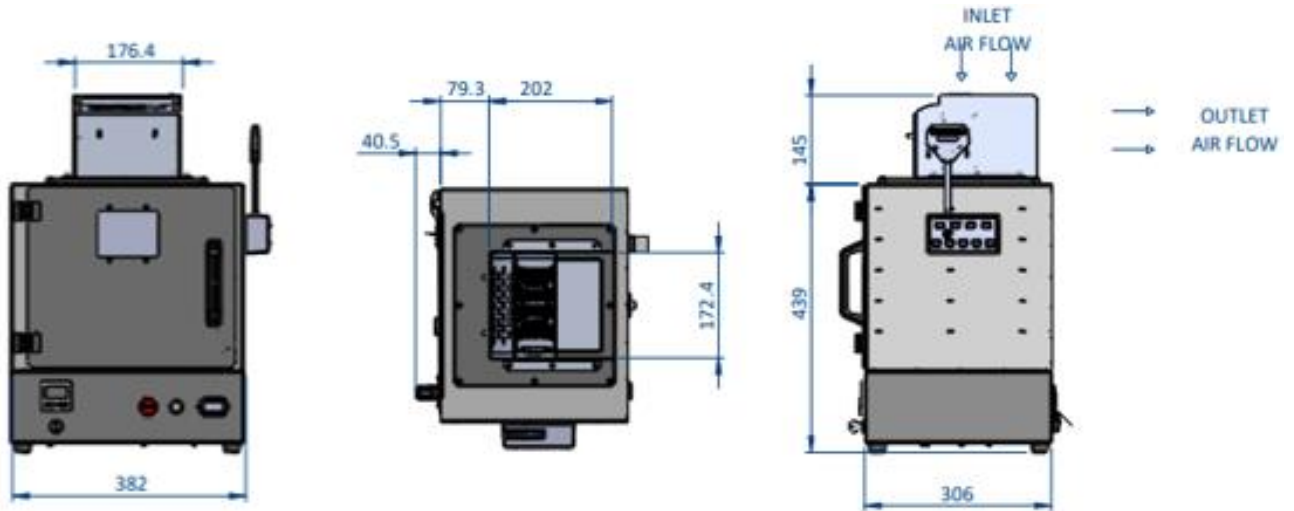
The CHAMBER-HG with SUBZERO-85 allows repeatable polymerization process thanks to a powerful lamp and an easy-to-use system.

Product reference		CHAMBER-HG With SUBERO-085 Lamp
<b>Electronics</b> 	<b>Input power</b>	Single phase 200 to 250 VAC, 50/60 Hz
	<b>Chamber connector to 220V</b>	IEC C14
	<b>PSU connector to 220V</b>	IEC C20
	<b>Inrush current (typ.)</b>	60A at 230 VAC
	<b>Ground leakage current</b>	<1 mA max at 240 VAC
	<b>Connector to UV Lamp</b>	SUBD 13W3 Type
	<b>Power consumption</b>	900W
	<b>Illumination mode</b>	Controlled by the user thanks to buttons at the front side of the chamber + remote control
<b>Optics</b> 	<i>Optical specifications given by IST:</i> UVA 35 mW/cm <sup>2</sup> UVB 35 mW/cm <sup>2</sup> UVC 10 mW/cm <sup>2</sup> at 20cm	
<b>Chamber mechanics</b> 	<b>Width and length</b>	382 mm x 306 mm
	<b>Height</b>	584 mm
	<b>Material</b>	Device body: Aluminum alloy
	<b>Weight</b>	18.5 kg
<b>PSU Mechanics</b> 	<b>Width and length</b>	160 mm x 420 mm
	<b>Height</b>	265 mm
	<b>Material</b>	Device body: Aluminum alloy
	<b>Weight</b>	9.0kg
<b>Thermal</b> 	<b>Cooling system</b>	Active air cooling with fans
<b>Environment</b> 	<b>Working temperature</b>	+10°C to +35°C
	<b>Working Humidity</b>	< 80% for temp < 30°C
	<b>IP Code</b>	IP40
<b>Additional items</b>		Delivered in a special wood case Key x1 pc., Tray x1pc., 2.5m chamber power cable x1pc., 2.5m ballast power cable x1 pc., SUBD wire x1pc., remote controller x1pc., and instruction guide x1 pc.





## Mechanical dimensions

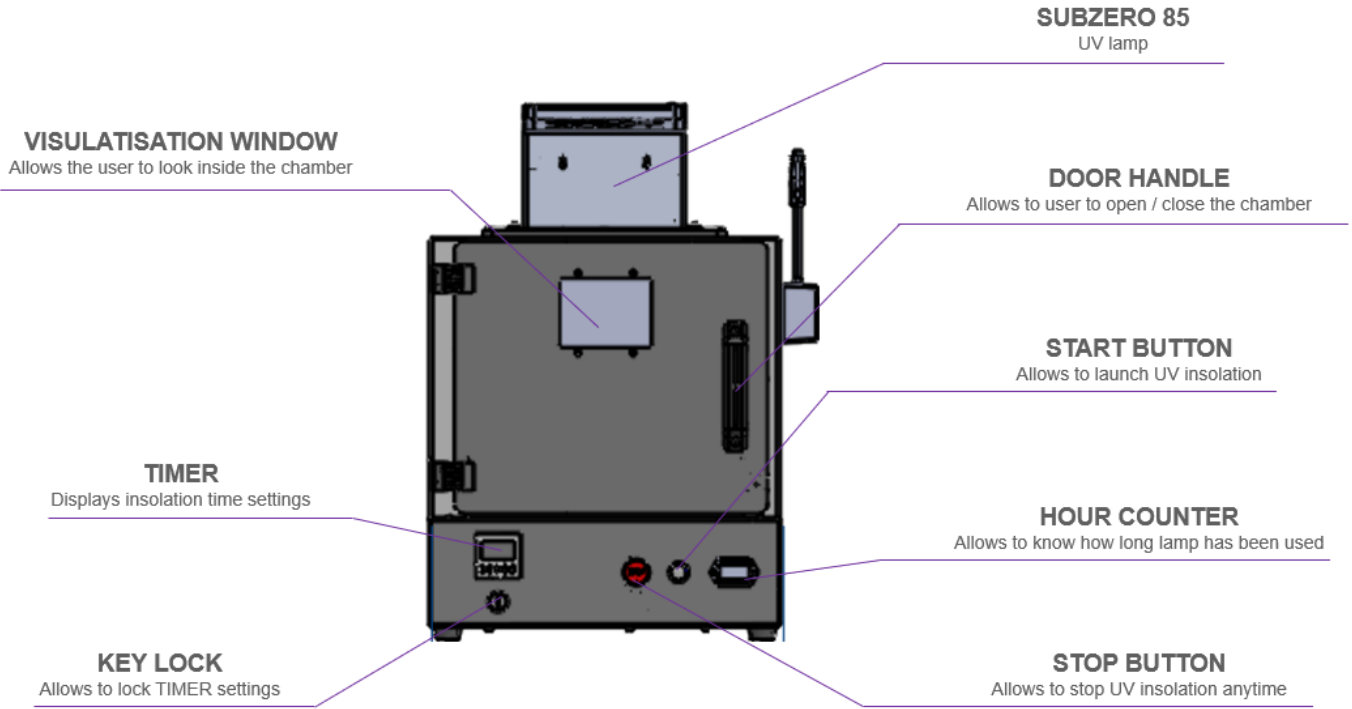




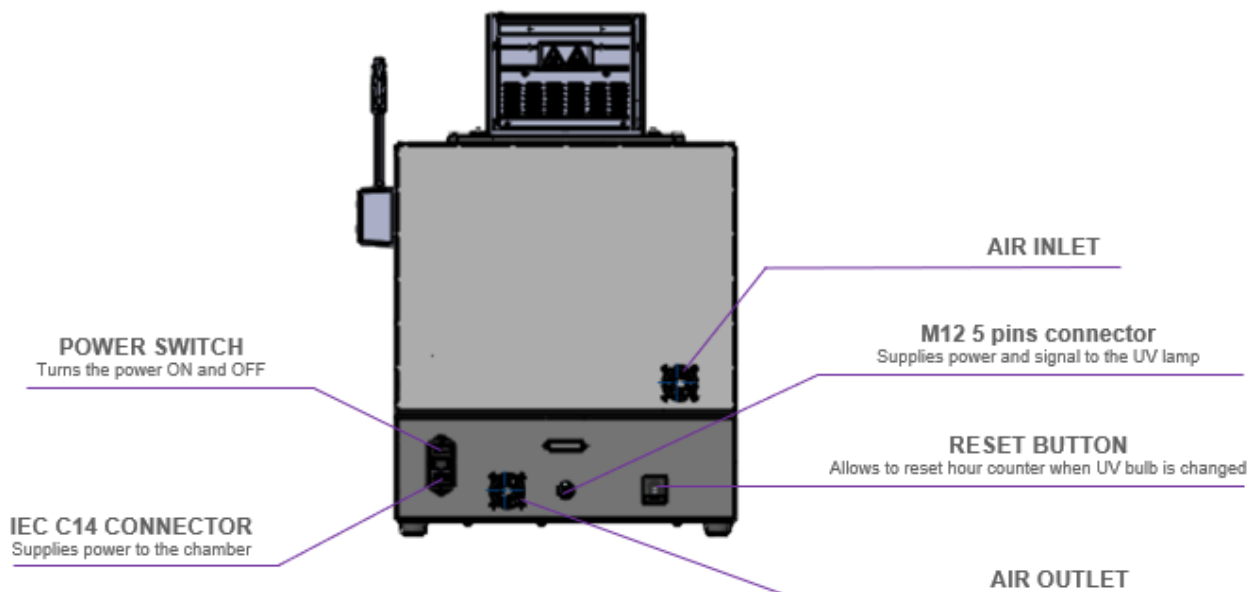
Names and functions of parts

CHAMBER-HG

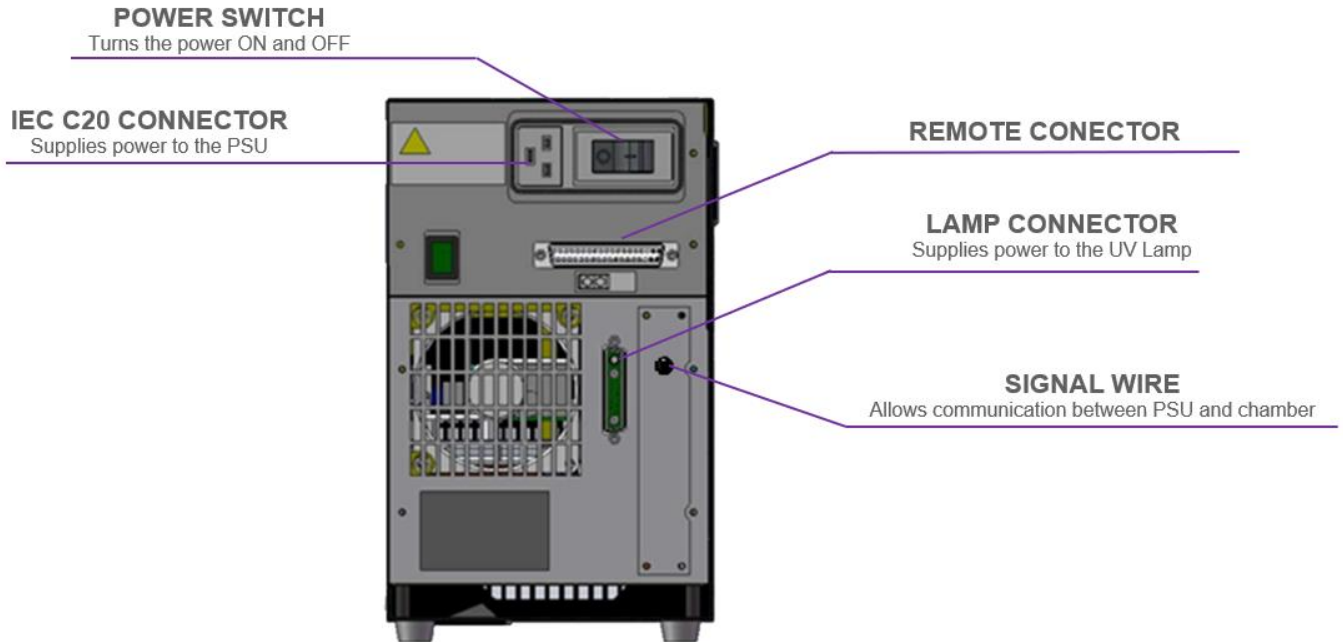
Front side



Back side

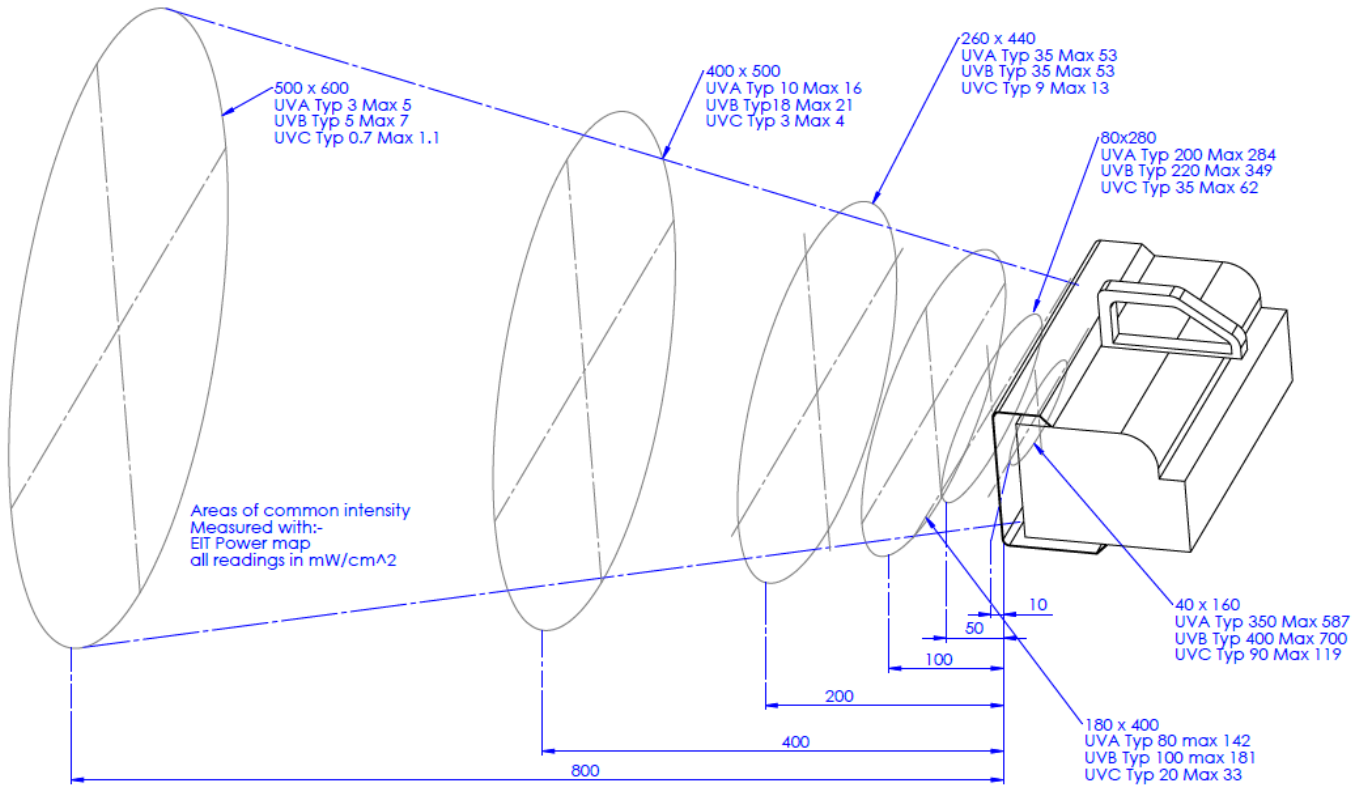


## POWER SUPPLY UNIT (PSU)

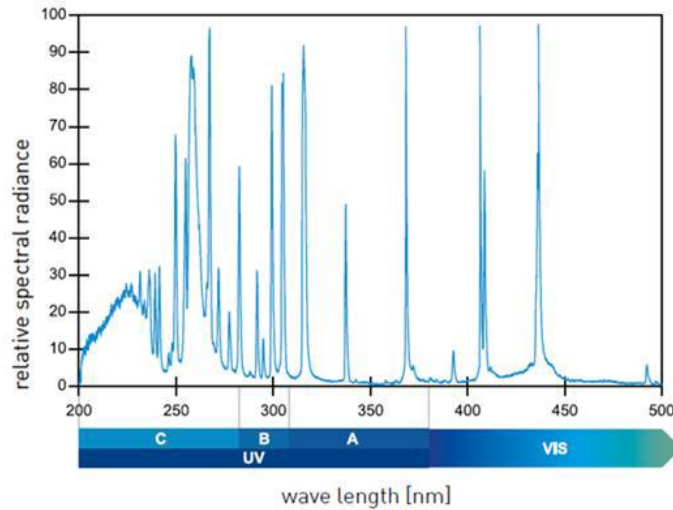




**Optical characteristics**

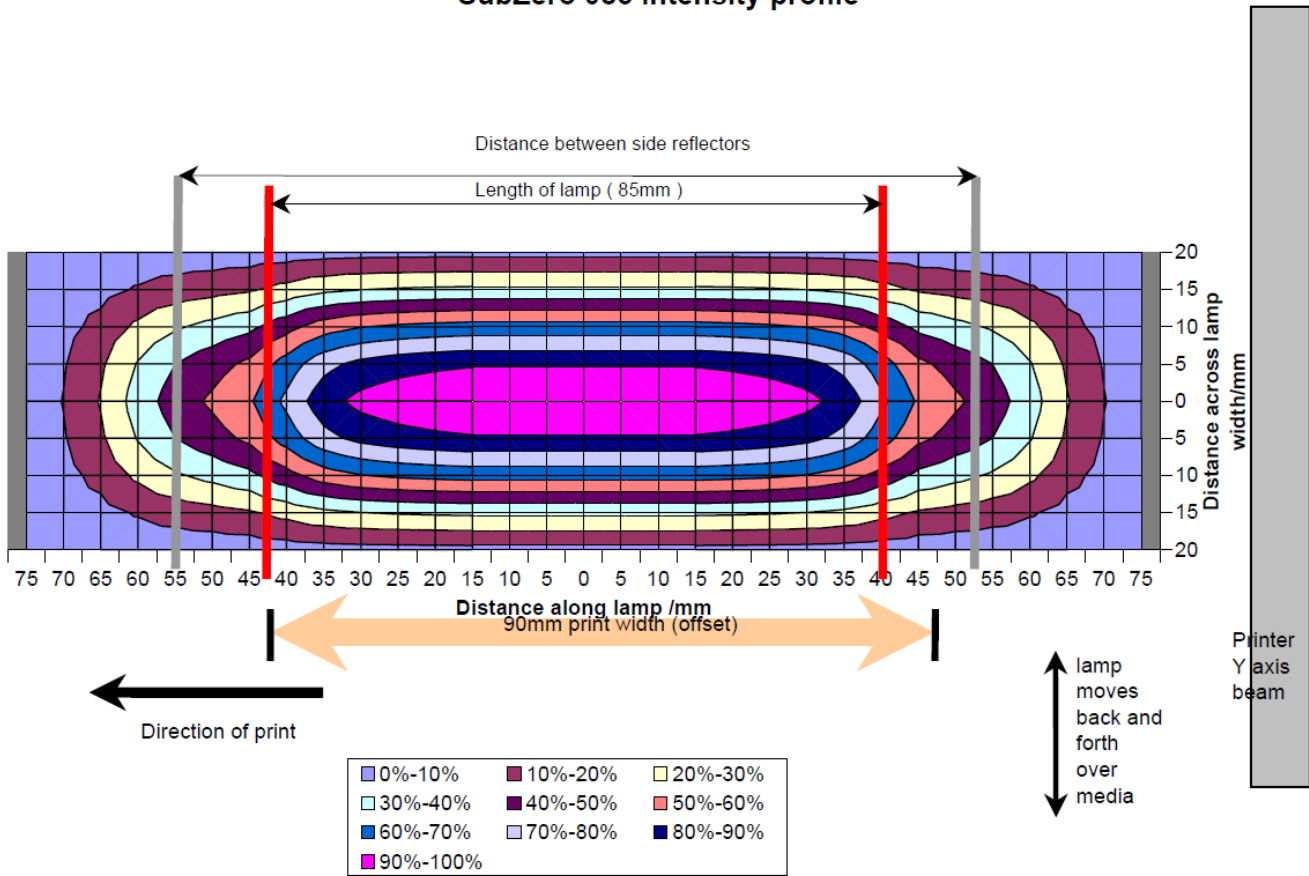


**Optical specifications given for a SUBZERO-170 lamp.**



**Spectrum given by a SUBZERO system.**

SubZero 085 intensity profile



Irradiance map for a SUBZERO-085 lamp.



How to use

1. Product installation

- Place the power supply unit (PSU) and the chamber on a stable and flat location.
- Provide sufficient space around the chamber so that the ventilation holes are not blocked (minimum 100mm in all directions).

2. Product connection

- Connect SUD 13W3 between UV Lamp and PSU
- Connect M12 5pins wire from PSU to chamber connector "SIGNAUX ALIMENTATION SUBZERO"
- Connect remote controller to PSU
- Connect PSU to 220V with IEC C20 wire
- Connect Chamber to 220V with IEC C14 wire

3. Product power-up

- Turn on power switch of the chamber and check if:
  - Chamber fans run
  - Timer is ON
- Turn on power switch of PSU and check if:
  - PSU fans run
  - UV Lamp fans run (they will stop after a moment)

4. Preheating of UV Lamp

- Select working level of Lamp with BIT 0,1 and 2 buttons on remote control:

POWER BIT 2	POWER BIT 1	POWER BIT 0	POWER %	COMMENTS
0	0	0	0	DO NOT USE
0	0	1	26	DO NOT USE
0	1	1	40	LOWEST WORKING LEVEL FOR 085
0	1	0	50	WORKING LEVEL FOR 085
1	1	0	60	WORKING LEVEL FOR 085
1	1	1	70	WORKING LEVEL FOR 085
1	0	1	85	WORKING LEVEL FOR 085
1	0	0	100	WORKING LEVEL FOR 085

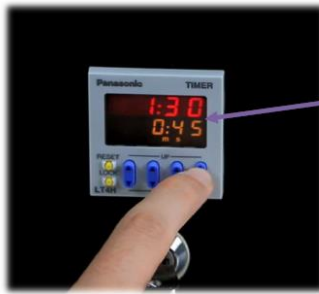
Power level for SUBZERO-085 - A Bit is at level '1' when pushed (illuminated). A bit is at level '0' when not pushed (not illuminated)

- Launch preheating of UV Lamp pushing "LAMP ON" button of remote control



- Wait few minutes until "UV READY" switch ON. Lamp is now ready to be used

**5. Set insolation time**



The red timer is fixed and represents the previous timer chosen. The orange timer is the one that you can change.

① Push the buttons to choose your time



To validate the time (red timer will equal to orange timer that you defined), push the STOP button or push the RESET button.

② Push the STOP button to set up the timer

**Lock option**

"LOCK" appears on the screen, when the timer screen is locked.



① Push the LOCK button

OR

"LOCK" appeared



② Turn the key to lock the screen timer

Even if you are trying to change the timer it will not work.



③ Cannot change the timer when it is locked

No "LOCK" so you can change the time.



④ Change the timer when it is unlocked

**6. Launch insolation cycle: press START button on chamber**

The blue light means that UV rays are emitted inside the UV-CHAMBER™.



Insolation starts until the end of timer. Early stop can be done pressing STOP button on Chamber (It reset timer)

**7. To switch off UV Lamp:**

- Stop insulation cycle pressing **STOP** button on chamber
- Turn off **"LAMP ON"** button on remote control
- Wait 5 minutes for UV Lamp cooling
- **DO NOT RESTART DURING COOLING TO AVOID UV BULB DAMAGE**
- After cooling, UV Lamp fan will stop
- Turn off Chamber power switch
- Turn off PSU power switch





## How to change UV bulb

1. Ensure the lamp head is fully cooled.
2. Disconnect SUBD wire from the UV-Lamp
3. Remove UV Lamp from Chamber



Figure 1. Remove the nuts



Figure 2. Push the lamp to the rear

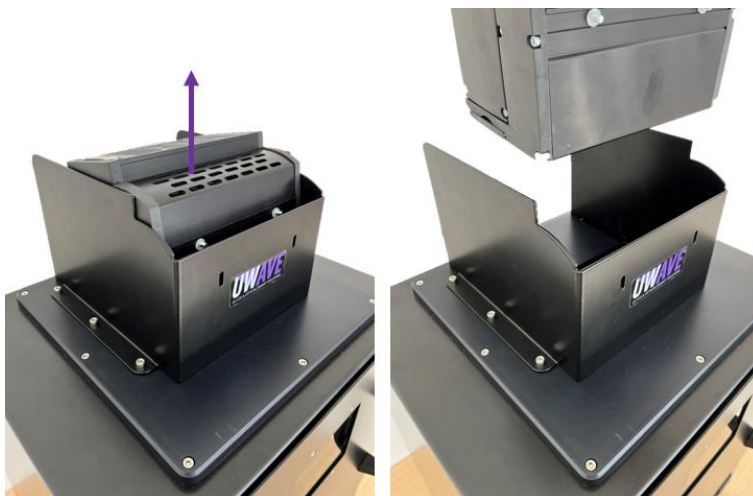


Figure 3. Pull up and remove the lamp

## 4. Remove the Lamp cartridge



1. Ensure the lamp head is fully cooled.
2. Remove the power lead from the top of the lamp head.
3. Using a 3mm Allen key, remove the M4 screw retaining the cartridge. The cartridge will unwind from the lamp housing.
4. Grasp the sides of the cartridge and remove.
5. If the cartridge remains stiff, insert the short end of the Allen key into the centre of the cartridge vent and twist towards the top (back) of the lamp.
6. Using gentle pressure, pull the cartridge out of the housing.

## 5. Replace the new Lamp cartridge



1. Wipe the lamp quartz envelope & reflectors with an alcohol wipe.
2. Align the cartridge with the lamp housing.
3. Slide the Cartridge PCB into the aluminium runners.
4. The side opposite to the mounting face is located first.
5. It is essential that the cartridge is located correctly prior to pushing home.
6. The cartridge is pulled in the last 10mm by the retaining screw.

**USE A COTTON GLOVES WHEN HANDLING A UVLAMP. DO NOT TOUCH THE LAMP WITH SKIN. THIS CAN CAUSE PERMANENT DAMAGE TO THE LAMP**

## 6. Reinstall UV Lamp onto the Chamber



Figure 4. Reinstall the lamp onto the chamber



Figure 5. Push the lamp to the front



Figure 6. Screw the nuts

## 7. Reset hour counter

On the front face of the chamber is located an hour counter. its role is to record how many time lamp has been switched on.

If the point is blinking, then the hour meter is counting.

If the point is not blinking, then the hour meter is not counting.

When you change UV bulb, you can reset hour counter pushing "RESET" button on the rear face of the chamber.

