



## **Device Operating Instructions Manual**

revision: 2.0 date: 26.06.2020

Dear customer,  
Thank you for choosing a Mesotech product.  
We confirm our full availability for any support or advice you may need.

Appliance produced by: Mesotech S.r.l.  
Via Mazzini 54 - Arzano (NA)  
tel. +39 (0) 815736072 fax. +39 (0) 814618340  
[www.mesotech.it](http://www.mesotech.it)



## WARNING!!!!



Please read this user manual carefully before using the  
Device COMBO<sub>3</sub>

Misuse of the Device may cause personal injury and/or damage to the machine.  
Such misuse will invalidate the warranty  
System and accessory specifications are subject to change without notice.

INTRODUCTION TO THE MANUAL	p. 4
SYMBOLS	p. 4
ADVICE AND WARNINGS	p. 6
SECURITY	p. 7
INSPECTION AND UNPACKING OF THE DEVICE	p. 10
MAIN COMPONENTS	p. 11
TECHNICAL DATA SHEET	p. 12
OZONE	p. 13
MOVEMENT	p. 16
INSTALLATION	p. 17
SWITCH-ON AND SWITCH-OFF PROCEDURE	p. 21
MENU GUIDE	p. 22
POWER OFF	p. 32
WARNINGS	p. 32
ALERTS	p. 32
REGULAR CLEANING	p. 34
ROUTINE MAINTENANCE	p. 34
FUSE REPLACEMENT	p. 34
RE-ORDERING INFORMATION	p. 34
PREVENTIVE MAINTENANCE	p. 35
TROUBLESHOOTING	p. 36
MANUFACTURER'S DECLARATION	p. 37


## 1. INTRODUCTION TO THE MANUAL

### Purpose


This user manual provides a description of the components of the Combo 3 device, controls and screens, operating instructions, and other important information for the operator.

In addition to this manual, further training is normally provided by Mesotech and the local distributor. For further information on the training available, please contact your local representative.

### Conventions

 Notes: The notes indicate information of particular interest

Caution: They indicate to the operator the precautionary measures necessary for the correct operation of the equipment. Failure to observe these precautions will invalidate the warranty.

 Caution: indicate to the caregiver the precautionary measures to work safely with the patient and the caregiver.

## 2. SYMBOLS



The text contained in this space, flanked by the "Information" symbol, provides useful information concerning the device.



Manufacturer

IPX0

Application not protected against the infiltration of liquids



Attention

Attention, please refer to the attached documentation

Attention, please refer to the instructions for use



Device BF, Insulation Class I



Electrical system grounding



Alternating current



Keep away from moisture



Temperature limits for storage and transport of the device.



May irritate the respiratory tract  
May cause drowsiness or dizziness  
Causes severe eye irritation



Equipment subject to the provisions of the EU Directive on Waste Electrical and Electronic Equipment (WEEE)

## NOTICE

In the development and production of the Combo 3 device, the standards and directives foreseen for electrical equipment for domestic use have been followed, the type tests foreseen by the standards have been carried out and at the end of production the routine tests foreseen by the test report filed in the company are carried out.

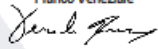

## 2.2 Compliance

The Combo 3 appliance complies with the general and essential requirements for low voltage electrical equipment for domestic use and the following product standards:

- CEI EN 60335-1:2008
- CEI EN 60335-1/A1/A2/A14: 2019
- CEI EN 60335-2-65: 2005
- CEI EN 60335-2-65/A1:2010
- CEI EN 60335-2-65/A11: 2013
- CEI EN 61340-4-7:2017
- CEI EN 55011:2018
- CEI EN 55011/A1:2019
- CEI EN 61000-6-1:2019
- CEI EN 61000-6-3:2007
- CEI EN 61000-6-3/A1:2013
- ISO 780:2015

It also complies with the following European Directive

- Directive 2014/35/EU (LV)
- Directive 2014/30/EU (EMC)
- Directive 2011/65 / EU (RoHS II)
- Directives 2015/863/EU (RoHS III)
- European Directive 2012/19 / EEC (WEEE)

DICHIARAZIONE DI CONFORMITA' CE MANUFACTURER'S CE DECLARATION of CONFORMITY	
<b>Produttore:</b> <b>Manufacturer:</b>	Mesotech Srl. Via Mazzini 52, 80022 Arzano (Napoli) - Italy
<b>Descrizione Generale:</b> <b>Tipo di apparecchiatura:</b> <b>General description:</b> <b>Device Type:</b>	Dispositivo per il condizionamento dell'aria tramite ozono. Devices for the air conditioning by ozone.
<b>Modello:</b> <b>Model:</b>	COMBO3 (Ozono - Ozone)
L'apparechiatura soddisfa ai requisiti essenziali delle seguenti Direttive: <i>The device meets the essential requirements provided by the following Directives:</i>	
2014/35/EC	Direttiva Bassa Tensione Low Voltage Directive
2014/30/EC	Direttiva Compatibilità Elettromagnetica Electromagnetic Compatibility Directive
2011/65/EU 2015/863/EU	Direttiva RoHS II e III sulla restrizione dell'uso di determinate sostanze pericolose nelle apparecchiature elettriche ed elettroniche. RoHS II and RoHS III Directive on the restriction of certain hazardous substances in electrical and electronic equipments
La conformità ai sopracitati requisiti essenziali è attestata dal marchio CE applicato sul prodotto. <i>The compliance with the aforementioned essential requirements is attested by affixing the CE marking on the product.</i>	
La presente dichiarazione di conformità è rilasciata sotto la responsabilità esclusiva del fabbricante. <i>This declaration of conformity is issued under the responsibility of the manufacturer.</i>	
Arzano, 04/05/2020	
Chief of Technical Department Franco Veneziale 	
	

## 3. ADVICE AND WARNINGS

### Rules for Proper Use

Some rules must be observed when using electrical devices:

- Do not touch the machine with wet hands or feet;
- Do not use the device barefoot;
- Do not expose the device to external agents: rain, sunshine, etc.
- When the device is not in use, turn it off and unplug it from the power outlet.

The device must not be used for any purpose other than that for which it was designed. Improper use would constitute a safety hazard. The manufacturer cannot be held liable for damage caused by improper use of the device.

Do not change the functions of the Combo 3 device in any way. Make sure the device is turned off and unplugged from the electrical outlet before cleaning it. If there is any malfunction or defect in the device, turn it off and unplug it from the wall socket and contact Mesotech's technical assistance centre

### How to store your device

- In its original packaging before being used for the first time;
- On the job, ready to go;

### Possible misuse

- There is no misuse by the user if he or she strictly follows the manufacturer's instructions for the use and maintenance of the Combo 3 device;

**Interference with other devices :** The Combo 3 device does not require any direct connection to other internal or external devices.

If other electrical devices are in operation, the Combo 3 device may be subjected to electromagnetic interference and disturbances that result in temporary wrong screen displays that cease when the disturbance ceases.

### Attention



The emission characteristics of this device make it suitable for use in industrial environments and hospitals (CISPR 11 class A). When used in a residential environment (for which CISPR 11 class B is normally required) this device may not provide adequate protection for radio-frequency communication services. The user may need to use mitigation measures, such as repositioning or reorientation of the device.

### Attention

The use of accessories, components or cables other than those specified and supplied by the device manufacturer may increase electromagnetic emissions and decrease the electromagnetic immunity of the device.

### Warnings:



- 1) Mobile phones and other electrical devices must be switched off when the Combo 3 device is operating.
- 2) The Combo 3 device should not be used near or on top of other devices, however if this is unavoidable, constantly check the device to make sure it is working properly as configured.
- 3) The device requires special precautions regarding Electromagnetic Compatibility, and must be installed and commissioned in accordance with the Electromagnetic Compatibility information in the enclosed documentation.

### Device repairs and modifications

- Only qualified technical operators can repair and maintain the device;
- maintenance must be carried out on the device in the manner and at the frequency indicated (page 31);
- use only original spare parts to replace any damaged parts; unauthorized modifications to the device could be dangerous;
- use with the device only Mesotech S.r.l. products;
- contact Mesotech for technical assistance and / or ordering spare parts

### Liability for defective products

Mesotech S.r.l. warrants the product against manufacturing defects for 1 (one) year and will provide free technical assistance within a reasonable time. The warranty does not cover errors caused by lack of attention, incorrect use, incorrect maintenance by users. Mesotech S.r.l. undertakes to provide circuit diagrams, parts lists, calibration instructions and all other necessary information for any qualified personnel authorized by the user and to repair the parts of the device that the manufacturer deems to be repairable.

## 4. SECURITY



- The instruction manual must first be read carefully because it provides all the necessary information for the correct use of the device.
- The operator must read these instructions carefully before using the device. If you encounter any problems, contact your distributor or agent immediately for service.

The following precautions and warnings are recommended:

### Electrical safety



Caution: To avoid the risk of electric shock, check the integrity of the enclosure and cables before use.

The device must be used in a dry, indoor location. Avoid splashing the device with liquids, the device is not protected against liquid penetration. Always use a grounded power outlet and always plug the device into the outlet correctly. Never remove the grounding and do not use an adapter and/or extension cord.

Unplug the power cord from the outlet by pulling the plug and not the cable. Turn off the power switch and unplug the power cord before cleaning the device. Do not move the enclosure panels.

The device contains no user-serviceable components. If your system needs assistance, please contact Mesotech S.r.l. or your local distributor directly.

No modifications to the device are allowed.

Make sure that the ventilation system of the device can work properly, keep a space of at least 10 cm all around the device. If ventilation is slowed or blocked, the system may overheat. The device is classified insulation class I.



When not in use by authorized personnel, the on/off switch must be kept in OFF mode and the plug unplugged from the socket to prevent possible use of the instrument by unauthorized personnel.



### WARNING:

To avoid the risk of electric shock, this equipment must only be connected to a mains supply with protective earth.



To maintain the highest level of safety, users must use the device in accordance with the directions and limitations of use contained in this manual. The manufacturer disclaims any liability for uses other than those provided in this manual. Reproduction or other use, in whole or in part, of any information or image found in this manual is strictly prohibited without written permission from the manufacturer.

## GENERAL INFORMATION

The device must be used according to the safety and operating instructions provided in the user manual, which must be kept with the device for possible future reference. Only authorized technicians must install, assemble, repair and maintain the device.

### Manufacturer data

- DENOMINATION: MESOTECH S.r.l.
- C.F./P.IVA: 06237641219
- LEGAL HEADQUARTERS: Viale Riviera di Chiaia 242 - 80100 Napoli

### PRODUCT IDENTIFICATION

- Type: Ozone Air Conditioning Device
- Insulation class: I
- Manufacturer: MESOTECH S.r.l.
- Model: COMBO 3

### Safety for the use of Ozone



Avoid ozone inhalation near or directly from pipes, nozzles, fittings and outlet grids of gas generators.

- If you notice a slight burning sensation in the nose, throat or eyes, it is advisable to ventilate the room and leave until you no longer notice the classic acrid and pungent
- Ozone is a very reactive gas and can cause detonations by coming into contact with certain substances. Avoid working simultaneously with the products indicated in the Safety Data Sheet shown below
- The oxygen-ozone-mixture is detonating and flammable, avoid operating the equipment near flames, braziers, lamps, heat sources, electrical equipment and anything that can produce sparks by rubbing or electric discharge.
- In case of treatment of environments with ozone, before giving free access to people or animals, check the gas concentration with appropriate instrumentation, the amount of ozone present in the air must not exceed 0.1ppm.
- For the periodic and constant use of ozone generators, it is necessary to fit a mask with filters suitable for gas abatement.
- All ambient measurements of ozone concentration must be carried out wearing the appropriate gas blast mask. If you enter the environment, for dangerous situations, without the appropriate mask, cover your mouth and nose well with a wet cloth and hold your breath as long as possible. It is however possible to breathe for a few minutes through the wet cloth and leave immediately if you feel a slight burning sensation in your nose or throat.
- Ozone is heavier than air, it tends to be located always in the lower part of the environment, for this reason a lot of attention must be paid when using gas in the presence of children or animals.
- Some plants are very sensitive to ozone, the most sensitive species are: tobacco, spinach, alfalfa, oats, rye, beans, barley and walnut. On these plants, it is possible to notice the appearance of the first symptoms of suffering after a few days already at concentrations of 0.05 ÷ 0.12 ppm.
- Ozone is very aggressive on some elements, continuous and intense use could damage them superficially, the elements to be controlled mainly are listed in the table below

MATERIAL	COMPATIBILITY
Galvanized steel	No
ABS	Good
Aluminium	Good/Discreet
Bronze	Good
Buna Nitrile (NBR)	No
CPVC	Excellent
EPDM	Excellent
Iron	No
FRD	No
Natural Rubber	No
Hypalon	Excellent
Stainless steel 304	Good
stainless steel 316	Excellent
Kel-f	Excellent
Magnesium	No
Neoprene	Good/Discreet
Nylon	No
Nikel	No
Brass	No
Polycarbonate	Excellent
Polypropylene	Moderate
Plexiglass	Excellent
PVC	Moderate
Copper	Good
Silicone	Excellent
Teflon	Excellent
Glass	Excellent
Viton	Excellent
Zinc	No



## Toxicological Information



Inhalation of ozone vapours is the main health risk.

The most notable alterations induced by this gas are mainly in the respiratory system:

concentrations close to 1 ppm give a burning sensation in the first airways, tearing, dryness of the oral mucosa, rhinitis, cough, headache, asthenia sometimes with nausea and vomiting.

At higher concentrations, the clinical picture worsens with the appearance of dyspnea, bronchospasm, pulmonary edema and respiratory paralysis within a short time.

Ozone concentrations of 4-5 ppm, inhaled for one hour cause acute pulmonary edema, 10 ppm are lethal within 4 hours and finally 50 ppm within a few minutes.

The toxicological picture, like other conditions, is more serious if ozone is produced and inhaled in urban air, because in this case nitrous gases are also present in almost equal quantities.

This mixture, already at the concentration of 1 ppm, causes damage to the central nervous system after only 2 hours.

Ozone is not a carcinogen and to date there have been no lethal cases of ozone poisoning worldwide.

Concentration in air (ppm O<sub>3</sub>).

0.05	Olfactory perception
0.4	Burning in the first airways
0.8 - 1	Tears, coughing
2	Nausea, headaches, vomiting
5	Bronchoconstriction
10	Fatal for pulmonary edema after 4 hours of exposure
50	Lethal after a few minutes of exposure

## First aid



- If exposure to ozone causes headache or shortness of breath, remove patient immediately and bring to area with uncontaminated fresh air.
- Workers who have been exposed to low ozone concentrations may be oxygenated and kept under observation by medical personnel. If exposure is severe, seek immediate medical attention.

In case of inhalation:

- Evaluate the patient's breathing
- Unconscious patients should be positioned so that any secretions can be released from the airway without damage to the patient.
- Check pulse
- If breathing has stopped, activate artificial respiration until breathing resumes naturally.
- Seek medical assistance immediately
- If the heartbeat is absent, start cardiac massage.

In case of eye irritation:

- Flush eyes with plenty of drinking water for at least 30 minutes.
- Continue spraying water until you reach a medical facility or emergency room.

Precautions

- Workers with cardiopulmonary problems should consult their doctor before starting an activity in an area where they may be exposed to ozone.
- Specific changes in cardiopulmonary function can occur in people exposed to low ozone concentrations.

## Fire-fighting measures

The gas is combustive and strongly increases the dangers of any kind of fire: stop the flow immediately and switch off the generator before any intervention.

Appropriate extinguishing media:

The product is neither flammable nor combustible, in the presence of a fire use: Water spray, CO<sub>2</sub>, Foam, Chemical powders depending on the materials involved in the fire.

Extinguishing media not to be used:

No one in particular.

Protective equipment for extinguishers:

If exposed to fumes use respiratory protection. Protection is particularly necessary if the smell of ozone is clearly noticeable in the environment and in any case if the products involved in the fire emit toxic fumes.

## 5. INSPECTION AND UNPACKING OF THE DEVICE



**It is extremely important to check the equipment at the reception.**

Each package received must be checked as follows: Administrative check to

ensure that there are no shipping errors:

- shipment number;
- weight and measurements;
- comparison of invoice and materials received

-Technical check to ensure that there is no damage to the items shipped:

- condition of the packaging (signs of knocks or breaks);
- state of the "shock watch" and "tilt watch" **(if they are red, it means that the packaging was not handled correctly)**;
- conditions of the items received



**These checks must be carried out while the courier is still present. MESOTECH S.r.l. guarantees the mechanical resistance of the packed materials.**

## 6. MAIN COMPONENTS



It's extremely important to check the device upon receipt



C  
tails 1101 COMBO 3

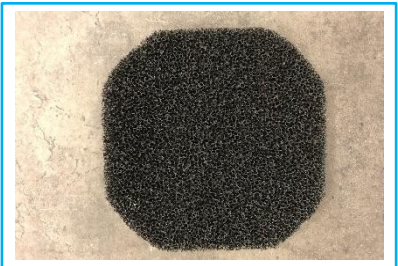
ELE.134 POWER CABLE 2 MT.

### ACCESSORIES



### CONSUMPTIONS

CAR.2815 CYLINDRICAL  
ACTIVATED CARBON FILTER



CAR.2816 CYLINDRICAL FILTER  
(AIR FILTRATION)



## 7. TECHNICAL DATA SHEET

Device Type	
Ozone Air Conditioning Device	
General Characteristics	
Power supply	230 V $\pm$ 5% 50-60 Hz
Maximum power	150W
Fuses	2 x F2A 250 V
Protection	Fan block
Insulation class	I
Dimensions [D x W x H].	350 x 380 x 220 mm
Maximum weight	15 Kg
Ozone Production	6 mg/h (20°C $\div$ 50% RH)
Ozone concentration	64.6 ppm
Air/Ozone flow	333 m <sup>3</sup> /h
Maximum treatable volume	2000 cubic meters

Estimated treatment time based on the size of the environment (O <sub>3</sub> emission only)	
30 m <sup>3</sup>	5 minutes
60 m <sup>3</sup>	10 minutes
90 m <sup>3</sup>	15 minutes
180 m <sup>3</sup>	26 minutes

Tempo di trattamento previsti in base alla metratura dell'ambiente (Trattamento TWINS)	
30 m <sup>3</sup>	15 minutes
60 m <sup>3</sup>	30 minutes
90 m <sup>3</sup>	45 minutes
180 m <sup>3</sup>	86 minutes

### Limits of use

The device must be kept in a dry, dust-free **and** well-ventilated place and, although it is not essential, it is preferable that the treatment rooms have air conditioning.

### Transport and storage

- Minimum temperature: 5°C
- Maximum temperature: 50°C
- Minimum relative humidity: 30% non-condensing
- Maximum relative humidity: 95% non-condensing
- Minimum atmospheric pressure: 700 hPa
- Maximum atmospheric pressure: 1060 hPa

### How it works

- Minimum temperature: 10°C
- Maximum temperature: 35°C
- Minimum relative humidity: 30% non-condensing
- Maximum relative humidity: 75% non-condensing
- Minimum atmospheric pressure: 700 hPa
- Maximum atmospheric pressure: 1060 hPa

### Device life cycle

The estimated service life of the device is 60 (sixty) months, which has been determined according to the wear and tear of the mechanical parts by estimating daily use of 8 hours.

## 8. OZONE (O<sup>3</sup>)

### Efficacy of Ozone

Ozone is a gas composed of three oxygen atoms (symbol O<sub>3</sub>), Christian Friedrich Schönbein discovered it during experiments of slow oxidation of white phosphorus and electrolysis of water.

It is an essential gas for life on Earth present in a layer of the atmosphere that protects us from dangerous UV-B and UV-C rays from the sun. This gas is the most powerful, usable, bactericidal and virulent gas that exists in nature.

The bactericidal action of Ozone is based on its high direct oxidation capacity, (Sonntag, 1890), these properties have been widely studied until obtaining an irrefutable demonstration (Helse, 1915 and 1918; Payr, 1935; Sykes, 1968; Gould, 1981).

Thanks to this quality, microorganisms (bacteria, viruses, moulds, fungi, yeasts, algae, etc.) are destroyed or inactivated with a rapid and definitive action without producing toxic by-products. The gas is also able to reduce heavy metals (mercury, arsenic, lead, etc.), pesticides (atrazine, propazine, molinate, etc.), pollutants (hydrocarbons, surfactants, nitrates, sulphites, etc.) and many other toxic substances present in water, air and food. Ozone removes all types of odours and is a powerful bleach.

Christian Friedrich Schönbein who called it ozone, the name comes from ozein the Greek word meaning odour. Schönbein is also remembered as the first person who he researched the reaction mechanisms between ozone and organic matter. In 1857 Werner Von Siemens patented and produced the first corona discharge generator. The first drinking water treatment plant was installed in Oudshoorn in the Netherlands in 1893. Later, in 1907, the French chemist Marius Paul Otto created the "Compagnie Générale de l'Ozone", the first company to implement the uses of ozone in the sterilization of drinking water. The first official medical applications of ozone date back to 1915, in fact during the First World War the gas was used for the treatment of gangrene.

Ozone has been widely applied for more than a century, for the treatment of water and air, in agriculture, livestock, food, chemical and sanitary sectors. Oxygen Ozone therapy has become an approved and practiced medical application worldwide. Countless are the scientific validations of ozone by scholars, universities and institutions, some of them (more than 19,000) are available online on PUBMED the most authoritative international biomedical literature.

### Properties of Ozone

Various studies have been carried out on the sensitivity of viruses to ozone, research seems to have shown that membrane viruses are significantly more sensitive than those without (Bolton et al. 1981).

The mechanism of action of Ozone on viruses is certainly not that of a destruction, as in the case of bacteria, but of an inactivation, the action of Ozone would consist in an oxidation and consequent inactivation of the specific viral receptors used to create the link with the cell wall to invade. This would block the viral reproduction mechanism at the level of its first phase: cell invasion. In the case of both viruses and bacteria, the dosage of ozone necessary to obtain sterilization is important, inactivation occurs with an "all or nothing" reaction, in the sense that below a "threshold dosage" no effect is observed.

Ozone is distinguished by some important advantages such as:

- Degrades non-biodegradable complex organic compounds;
- It has a high oxidizing power (2.07V);
- It has an energetic disinfecting action;
- Does not form halogen derivatives;
- The oxygen produced is not toxic and does not require any elimination treatment;

Disinfection is the treatment that destroys or inactivates pathogenic microorganisms that can be grouped in order of resistance to treatment, in the following groups:

- Bacteria (E.Coli, Staphylococcus, Streptococcus, ...)
- protozoa cysts (Giardia lamblia)
- spores

The disinfectant action is carried out through:

- oxidation and thus cell wall rupture;
- diffusion through the cell wall and interference in cell activity.

## Ozone in international regulations

**European Community** - The use of ozone for food purposes has been introduced in Europe in 2003, for disinfection and sterilisation during bottling processes some water. In fact, Directive 2003/40/EC of the EFSA Commission of 16 May 2003 determined the list, concentration limits and labelling requirements for constituents of natural mineral waters and the conditions for using ozone-enriched air for the treatment of natural mineral waters and spring waters. In particular, as stated in Directive 80/777/EEC, as amended, Article 4(1)(b) provides for 'the possibility of separating iron, manganese, sulphur and arsenic from certain natural mineral waters by ozone-enriched air treatment, subject to evaluation of this treatment by the Scientific Committee on Food and adoption of the conditions of use by the Standing Committee on the Food Chain and Animal Health'.

**Italy** - The Ministry of Health, with protocol no. 224482 of July 31, 1996, has recognized the use of ozone in the treatment of air and water, as a natural defense for the sterilization of environments contaminated by bacteria, viruses, spores, molds and mites.

**USA** - Following documentation provided by the EPRI (Electric Power Research Institute) and a panel of experts who evaluated the efficacy and safety of ozone in food processing and storage, the FDA, a body of the United States Department of Health and Human Services, admitted on June 26, 2001 to validate the compatibility of ozone with human activities, the use of ozone as an antimicrobial agent in gaseous phase or in aqueous solution in production processes (treatment, processing, preservation) of foods such as meat, eggs, fish, cheese, fruit and vegetables. In particular, document 21 CFR part 173.368 (register n°00F-1482) has labelled ozone as a GRAS (generally recognized as safe) element, i.e. a secondary food additive safe for human health.

**Canada** - In wash water (and ice) the amount of ozone may not exceed the minimum levels necessary to reduce bacterial load; if used for drinking water it must be indicated on the label.

Ozone cannot be used to increase the shelf life of products.

## Some important international validations:

- 1976 EPA Environmental Protection Agency (USA)
- 1982 IBWA International Bottled Water Association (USA)
- 1999 USDA Department of Agriculture (USA)
- 2001 FDA Food and Drug Administration (USA)
- 2002 NOP National Organic Program (USA)
- 2003 EFSA Food Safety Agency (EU)
- 2012 BPR European Authorised Biocidal Products List (EU).

## Indicative treatment time with Ozone

National and international research bodies and institutes indicate the following as average treatment times.

In order to define the most suitable ozonation it will be necessary to consider the m3 to be treated and the density of viruses, bacteria and microorganisms present.

Body	O <sup>3</sup> Concentration	Exposure Time
<b>Bacteria</b> (E. Coli, Legionella, Mycobacterium, Fecal Streptococcus)	0.23 ppm ÷ 2.2 ppm	< 20 min
<b>Virus</b> (Poliovirus Type-1, Human Rotavirus, Enteric Virus)	0.2 ppm ÷ 4.1 ppm	< 20 min
<b>Moulds</b> (Aspergillus Niger, various strains of Penicillium, Cladosporium)	2 ppm	60 min
<b>Mushrooms</b> (Candida Parapsilosis, Candida Tropicalis)	0.02 ppm ÷ 0.26 ppm	< 1.67 min
<b>Insects</b> (Acarus Siro, Tyrophagus Casei, Tyrophagus Putrescentiae)	1.5 ppm ÷ 2 ppm	30 min

(Sources: Edelstein et al.,1982; Joret et al.,1982; Farooq and Akhlaque, 1983; Harakeh and Butle,1986; Kawamuram et al. 1986).



## 9. MOVEMENT

The device\* must be moved by at least two people.



\*The image of the equipment is for demonstration purposes and may not be the device covered by the manual.

The elements to be considered and which contribute to the definition of the level of risk associated with manual handling of loads are the following:

- Load characteristics: too heavy (over 30 kg for men, 20 kg for women), too bulky, unstable, etc.;
- Positions assumed in lifting: flexed back, twisting of the trunk, excessive distance of the load from the trunk, etc.;
- Amount of physical effort: high frequency of lifting actions or prolonged lifting time;
- Characteristics of the working environment: presence of unevenness (stairs, isolated steps, etc.), state of the flooring, suboptimal microclimate, etc..

**INFORMATION** on the risks associated with the activity: in general, we speak of risks associated with the handling of loads when their weight exceeds 3 kg.

Below this weight the risk to the back can generally be considered negligible. Therefore, the following should be observed whenever loads above the above weight limit are to be handled:

- When lifting loads, the trunk must be kept erect, bending the legs instead of the back, the load must be kept as close to the body as possible and torsion of the torso must be avoided;
- to avoid dangerous positions for the back, it is advisable to move objects in the area between the height of the shoulders and the knuckles of the hands (arms extended along the hips);
- If you have to place an object on top, you must avoid arching your back; in this case you must use a suitable stool or a ladder; no makeshift means (chairs, stacks of parcels) must be used to store or take materials from the shelves, but special ladders that meet the standard;
- for excessive weights and long journeys, suitable trolleys, suitable for the weight to be carried, must be used;
- if possible, the weight should be evenly distributed between the two hands;
- in the case of multi-person transport of loads, movements must be coordinated;
- when transporting materials of particular length on the shoulder, always make sure that you always have
- the clear view and keep the front of the load raised beyond the man height;
- suitable footwear must be used; you must always check that the floor is stable and even.





## 10. INSTALLATION

Do not position the device in such a way that it is difficult to disconnect.

Open the packaging and place the equipment in the room/environment to be treated.

### How to install:

1. Connect the power cord to the filter plug on the rear panel. (see photos no. 1 and 2)
2. Insert the plug into the 230V AC power socket.

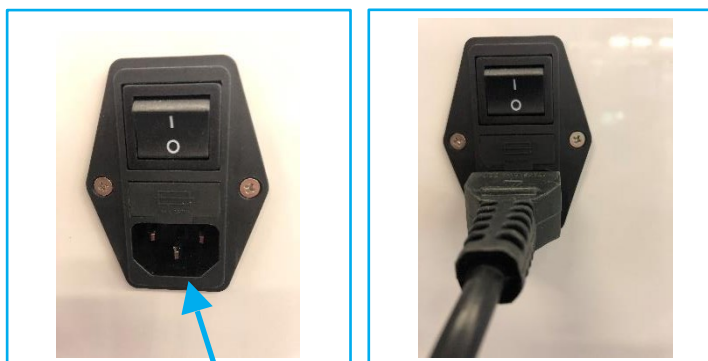


Photo 1 Photo 2



Power cable



### Warnings:

- 1) Once Ozone generation is activated, exit the environment immediately, you can return to it after the cycle time.
- 2) Air out the rooms after each treatment to remove any ozone residues.
- 2) Never cover the intake and exhaust air grilles.
- 3) A sound signal is emitted at the end of each treatment cycle.

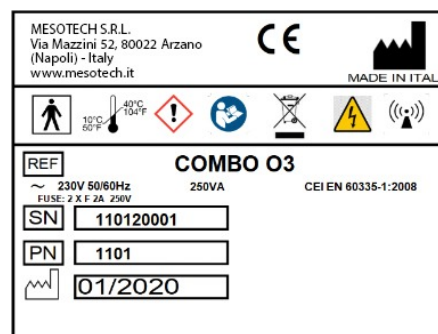
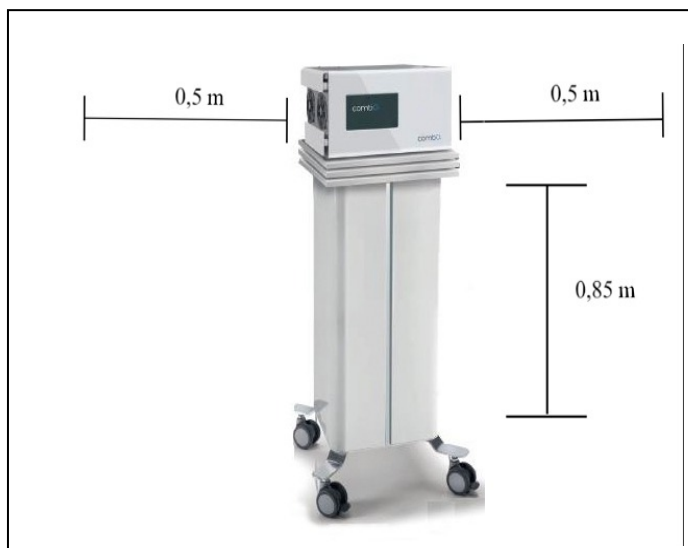


Photo 3

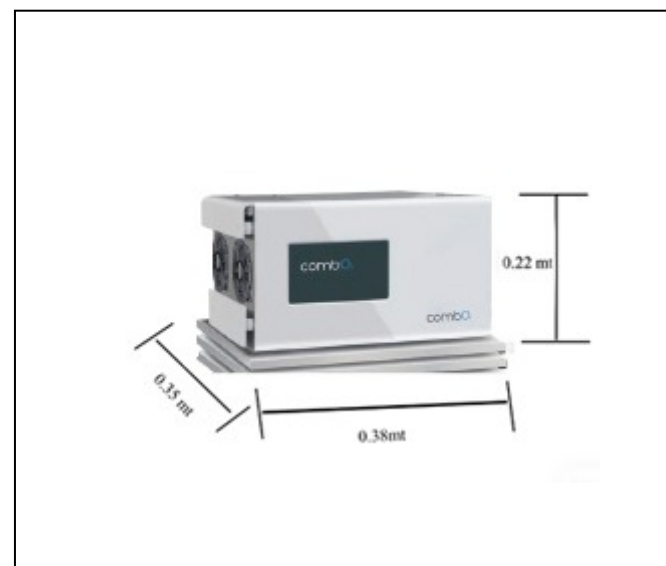
The label on the back of the equipment certifies by affixing the CE mark, that the Combo 3 system has been designed and constructed in accordance with the safety standards and laws for low voltage electrical equipment. (See compliance on page 5)

## POSITIONING, DIMENSIONS AND WALL DISTANCES:

Designate an adequately ventilated space with free air circulation. The working area of the system must be prepared according to the distances shown in the figures below. To ensure sufficient ventilation, the side surfaces of the system must be at least 0.5 m from walls and other obstacles to air circulation.



*Space required for air circulation Combo O3*

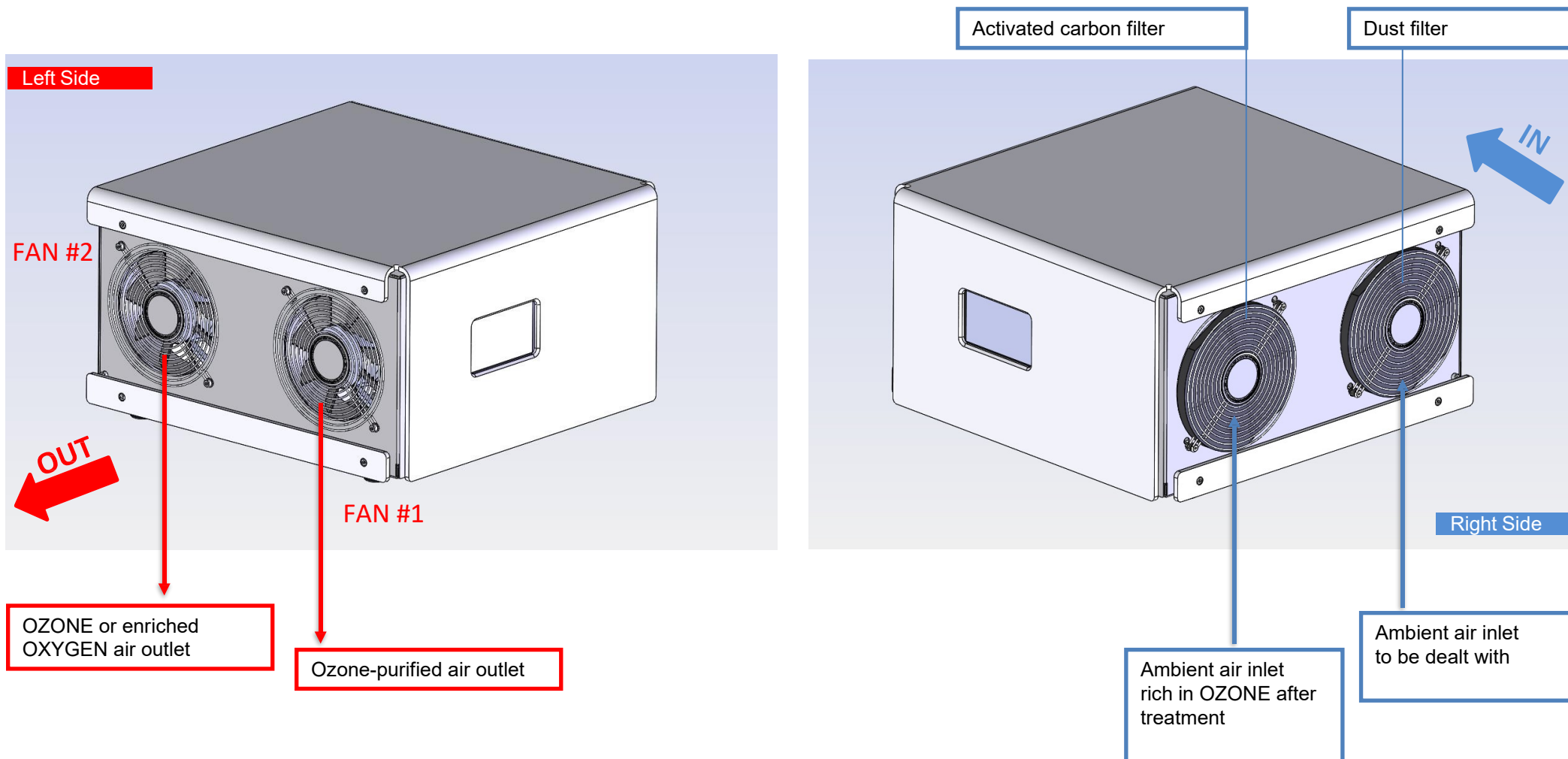


*Physical dimensions of the Combo O3 system*

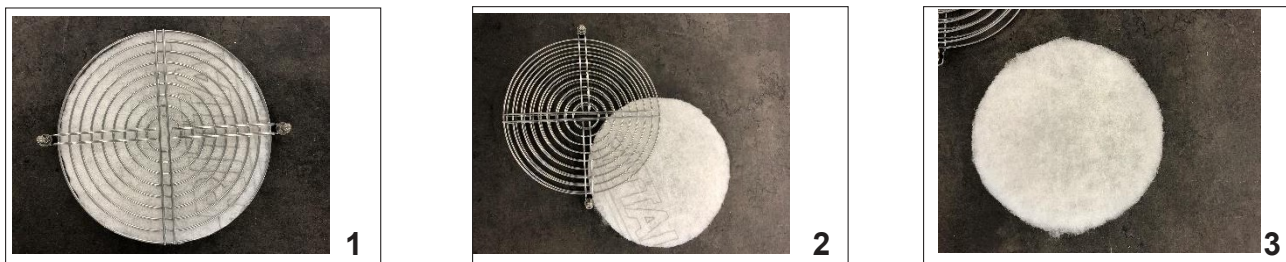
## VENTILATION GRIDS:

The ventilation openings on the right side suck in the ambient air, passing it through dedicated filters according to the selected treatment.

The ventilation openings on the left side emit air into the room via fans, the operation of which depends on the selected treatment.

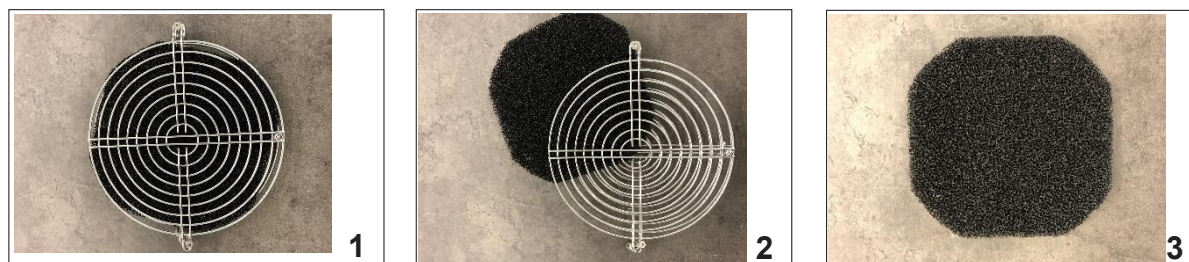


## DUST FILTERS REPLACEMENT:



The procedure for replacing the filters is simple. Remove the dust or activated carbon filter from the grilles laterally. Insert the new filter by positioning it so that it does not come out of the grilles and covers the entire ventilation hole.

## REPLACEMENT OF OZONE ABATEMENT FILTERS (ACTIVATED CARBON):



Once the ozone depletion filters are exhausted (500 hours is the expected duration), their replacement is necessary for the correct operation of the equipment. This is indicated by the equipment with the password input screen, this is communicated by Mesotech once the filters replacement or scheduled maintenance has been carried out. See preventive maintenance table.



## 11. SWITCH-ON AND SWITCH-OFF PROCEDURE

**After correctly installing the device as indicated in the relevant chapter:**

- Switch the appliance on by pressing the power switch on the back of the device;
- The LCD Touch Screen Display turns on and displays the name of the Combo 3 equipment;
- Follow the on-screen instructions to select the desired language and treatment parameters.
- Start the treatment by selecting the START button
- In case you want to stop the treatment before the end of the treatment, select the STOP button.
- After each use, turn off the unit by pressing the power switch on the back of the unit.

**COMBO ON/OFF SWITCH 3**



## 12.MENU DRIVING

### TREATMENTS SELECTION

#### Selection : TWINS

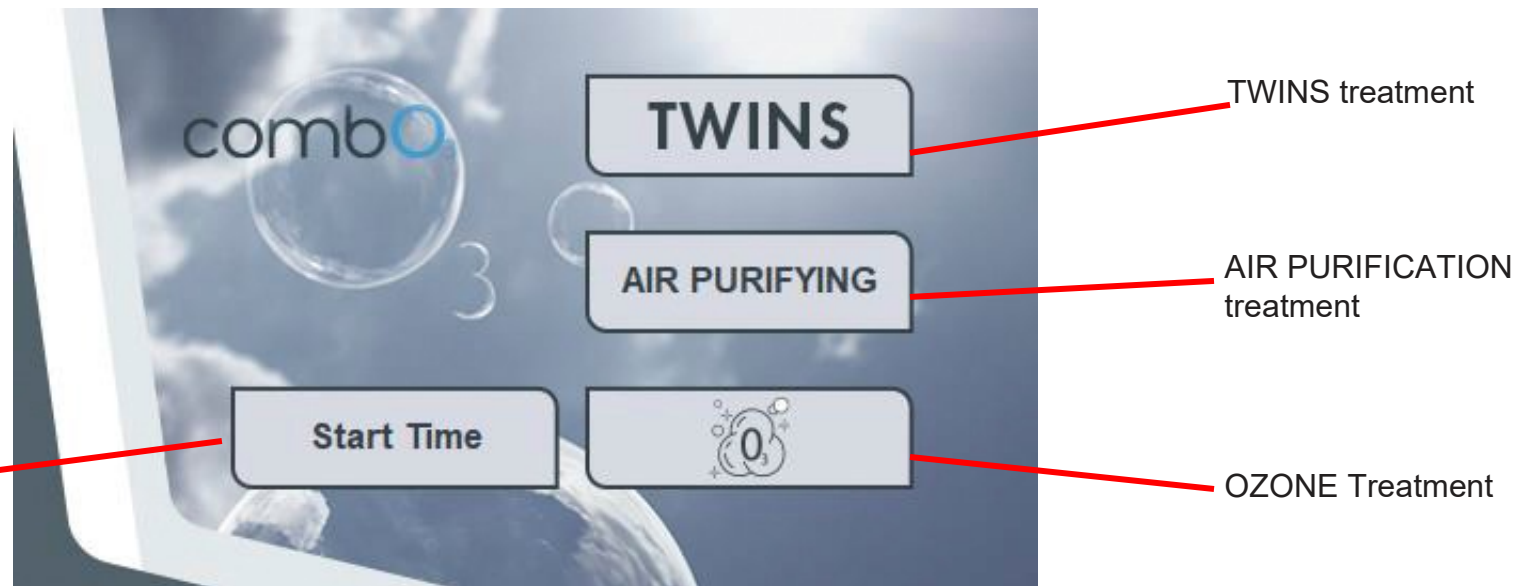
This selection activates a first treatment with ozone emission depending on the volume of the environment to be treated, then automatically a second treatment is activated with the suction of the emitted ozone and re-injection of oxygen.

#### Selection : AIR PURIFICATION

This selection activates a user selectable double treatment, with oxygen emission or alternatively without oxygen emission.

#### Selection : OZONE

This selection activates a single treatment with ozone emission depending on the volume of the environment to be



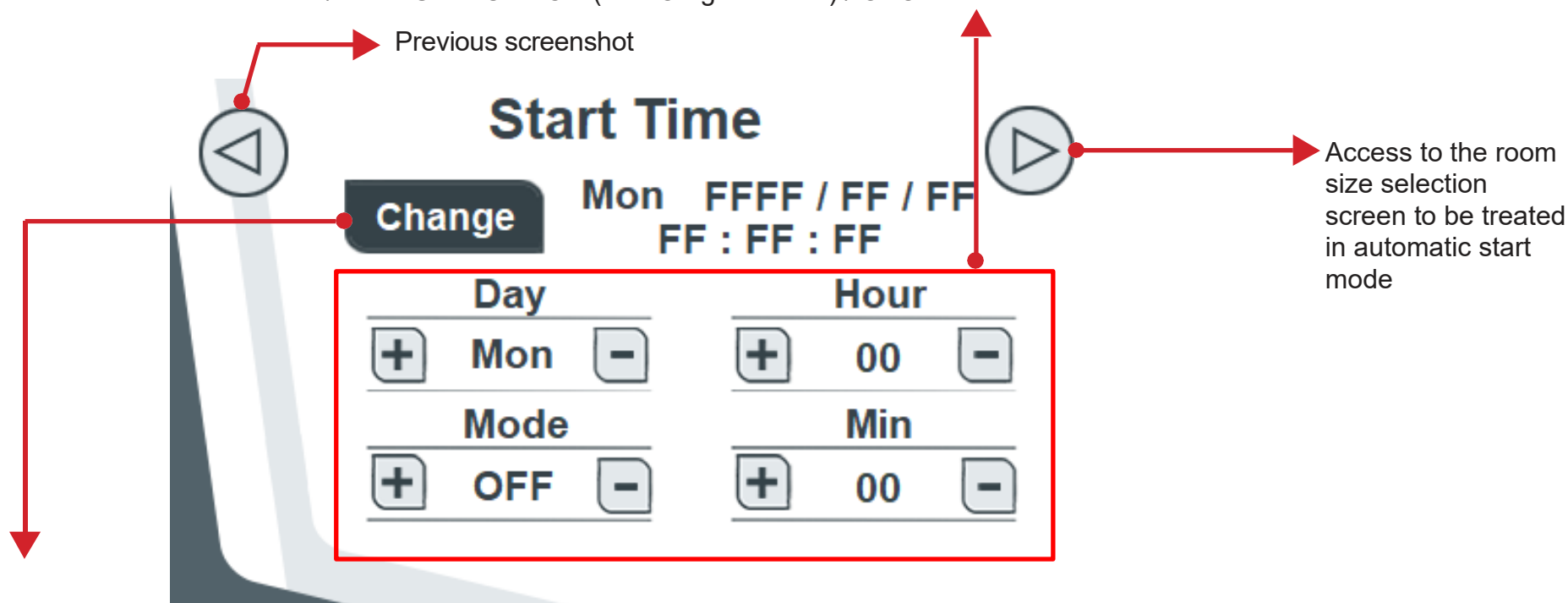


## AUTOMATIC START SELECTION

### Selection : START TIME

This selection allows you to select the day, hour and minute of the automatic start of the equipment.

After setting the day of the week and the time, set in which mode (MODE) you want to start the machine, TWINS / AIR PURIFICATION (with O2 generation) / OZONE

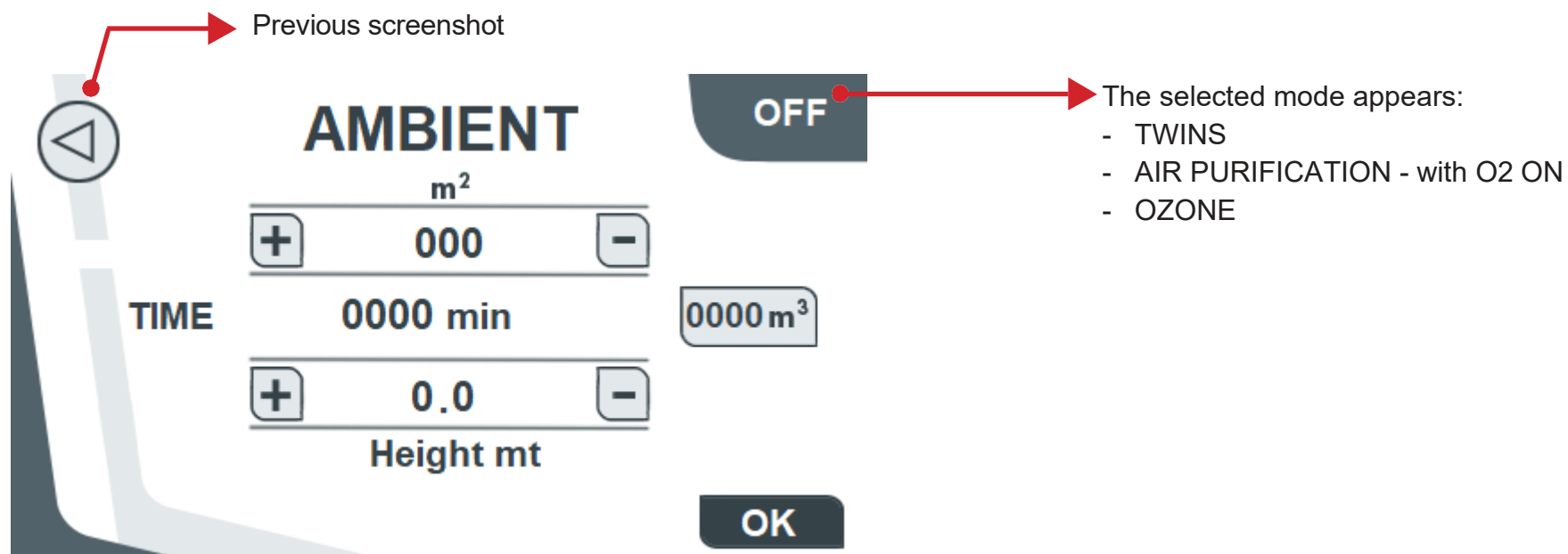


### Setting : DATE

By selecting the CHANGE button you can change the current Year/Month/Day date and time if they are not correct. The date set in the device is shown on the display.

## AUTOMATIC START SELECTION - ENVIRONMENT SIZE SELECTION SCREEN TO BE TREATED

By setting the automatic start mode you can select the size of the environment to be treated during the automatic mode.





## TREATMENT SELECTION - TWINS

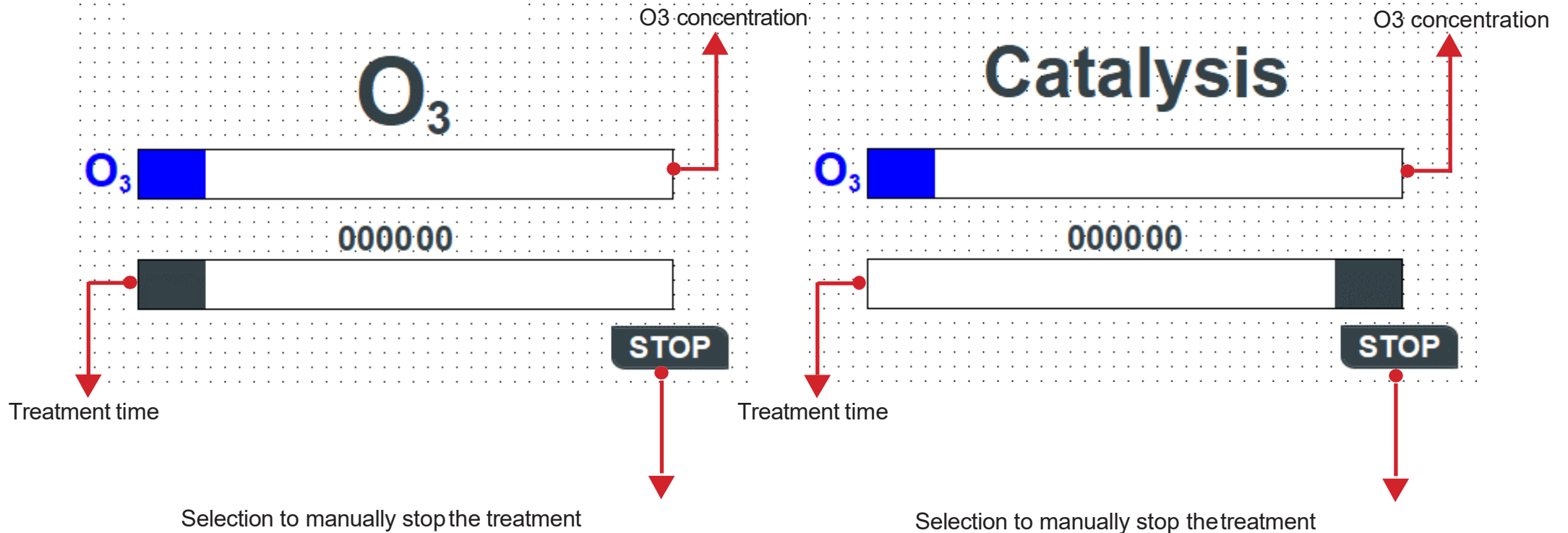
TWINS - Ozone Emission Cycle and Reabsorption and Oxygen Emission Cycle



## OPERATING SCREEN TWINS

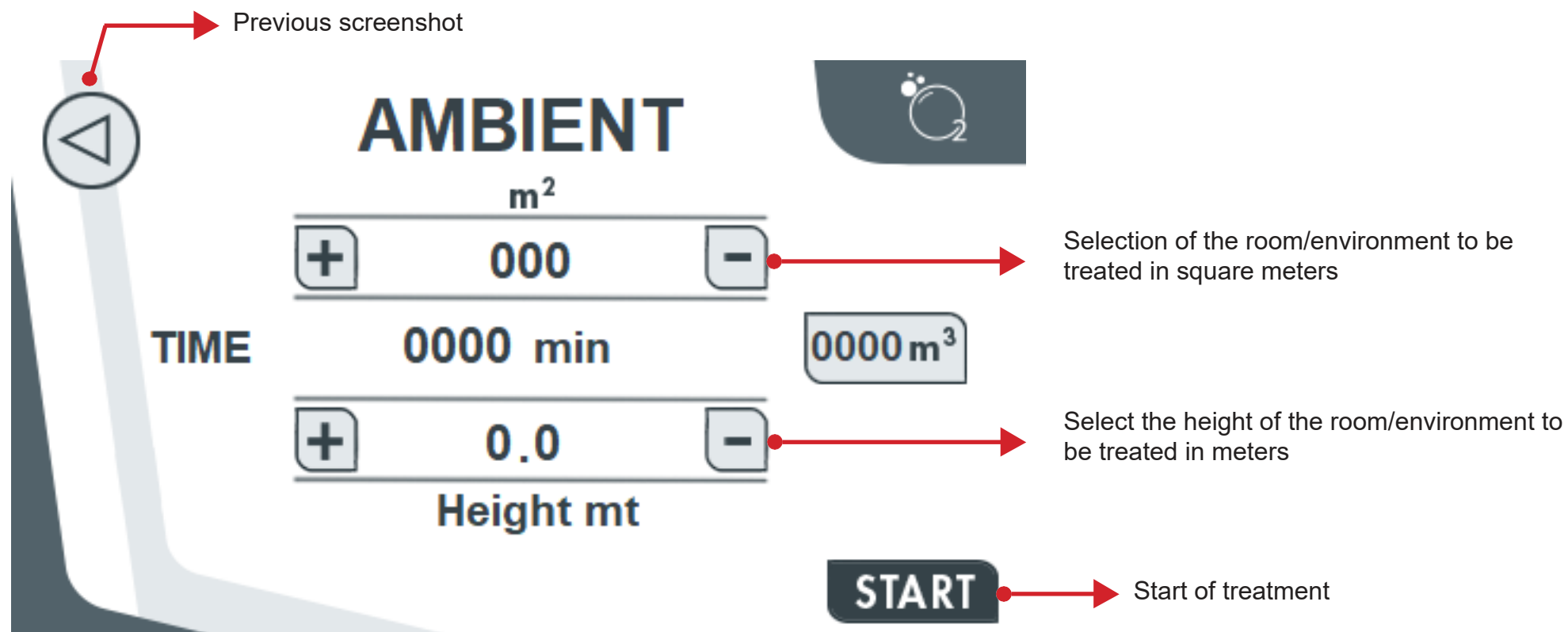
First Stage - Ozone Release into the Environment

Second Phase - Ozone Aspiration from the Environment

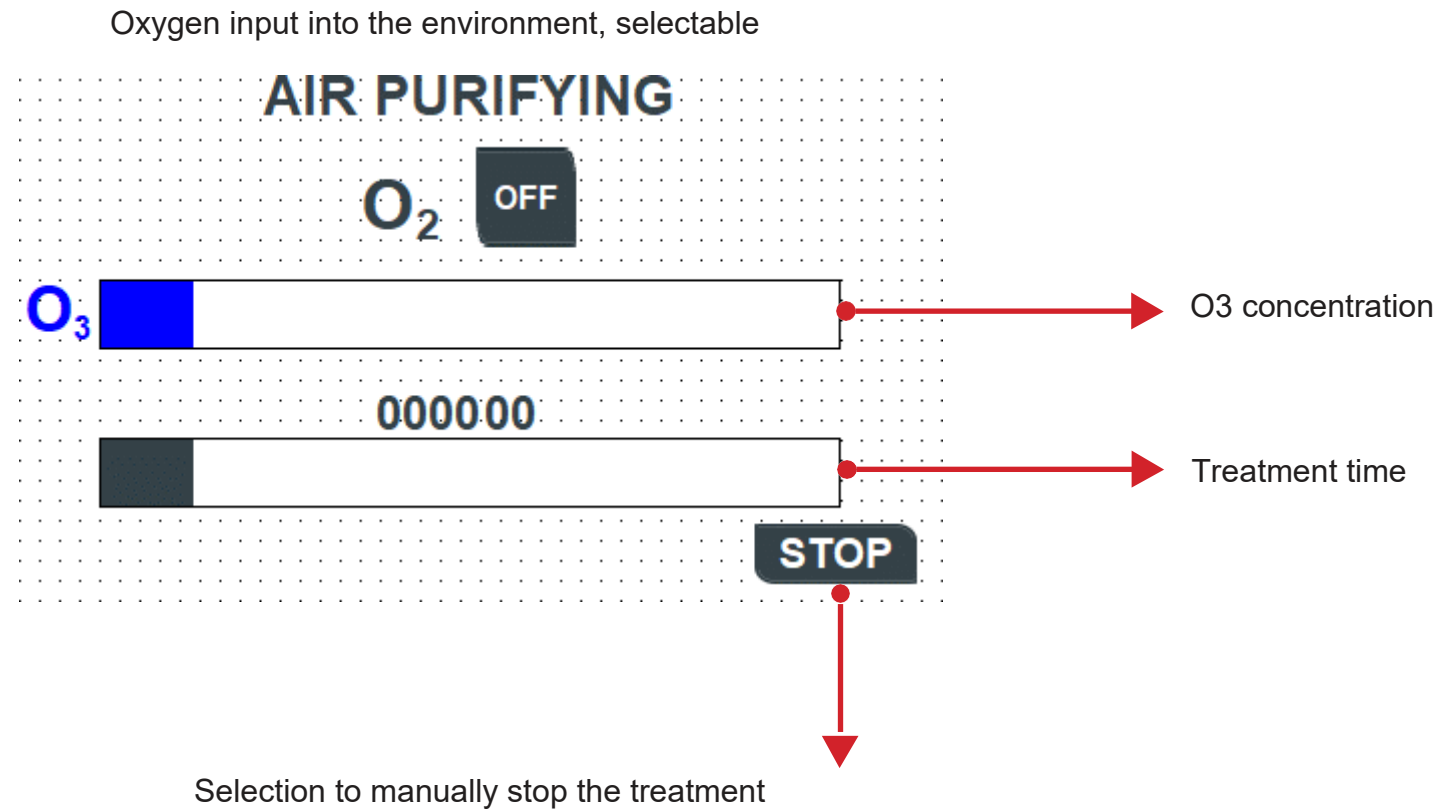


## TREATMENT SELECTION - AIR PURIFICATION

AIR PURIFICATION - Oxygen emission cycle, selectable, for the time calculated on the basis of the size of the environment to be treated. Alternatively, air aspiration only.



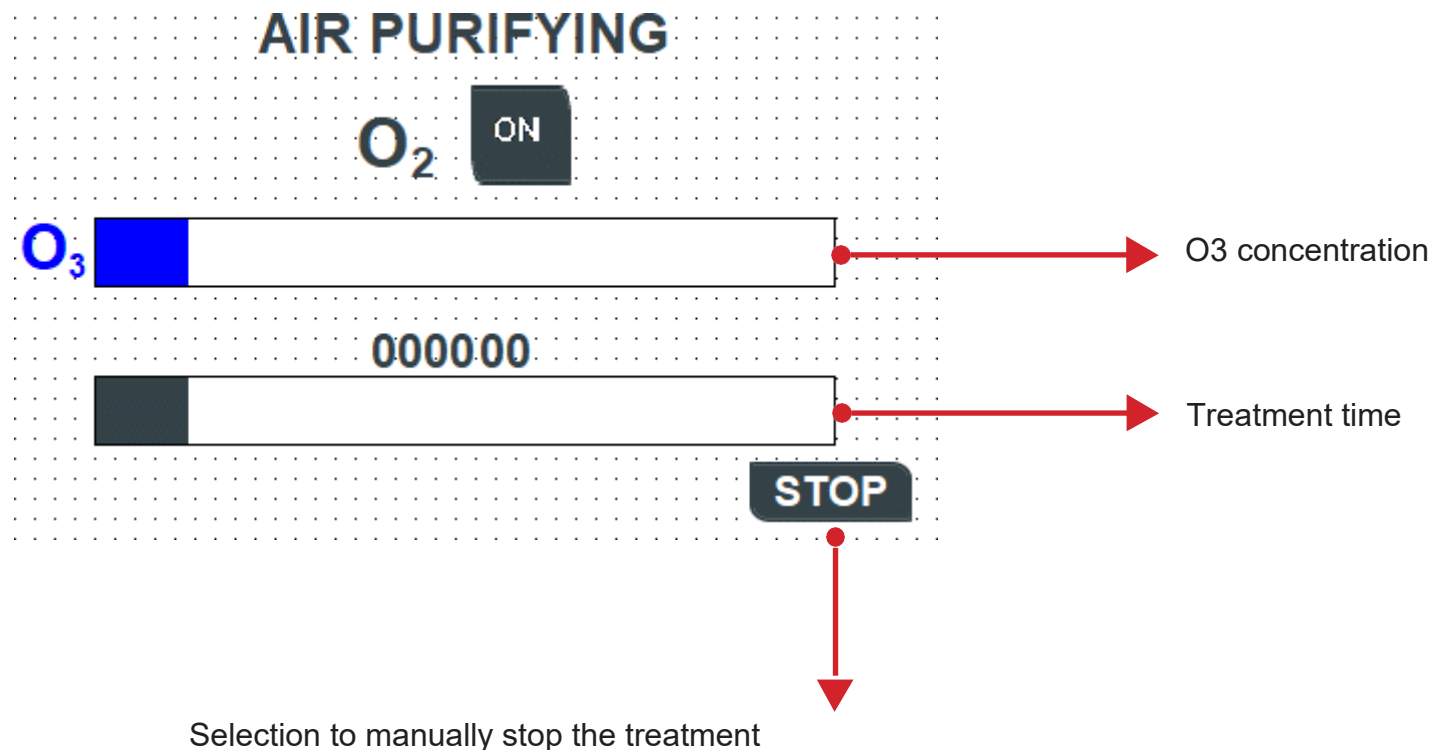
## AIR PURIFICATION OPERATING SCREEN - WITHOUT OXYGEN GENERATION



## AIR PURIFICATION OPERATING SCREEN - WITH OXYGEN GENERATION

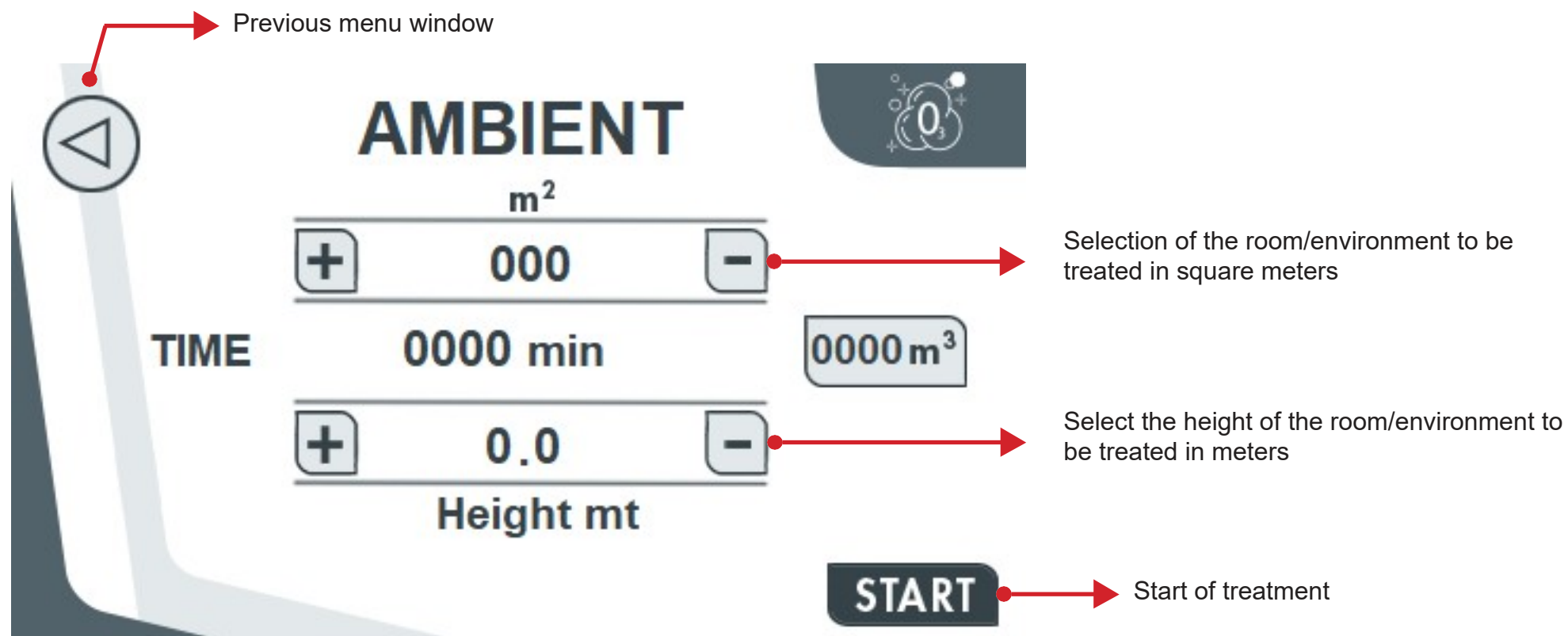
Oxygen supply to the environment, ON.

In this case, in addition to ambient air being filtered through activated carbon for the generation of oxygen, air with enriched oxygen is delivered, thanks to the presence of internal zeolite filters.

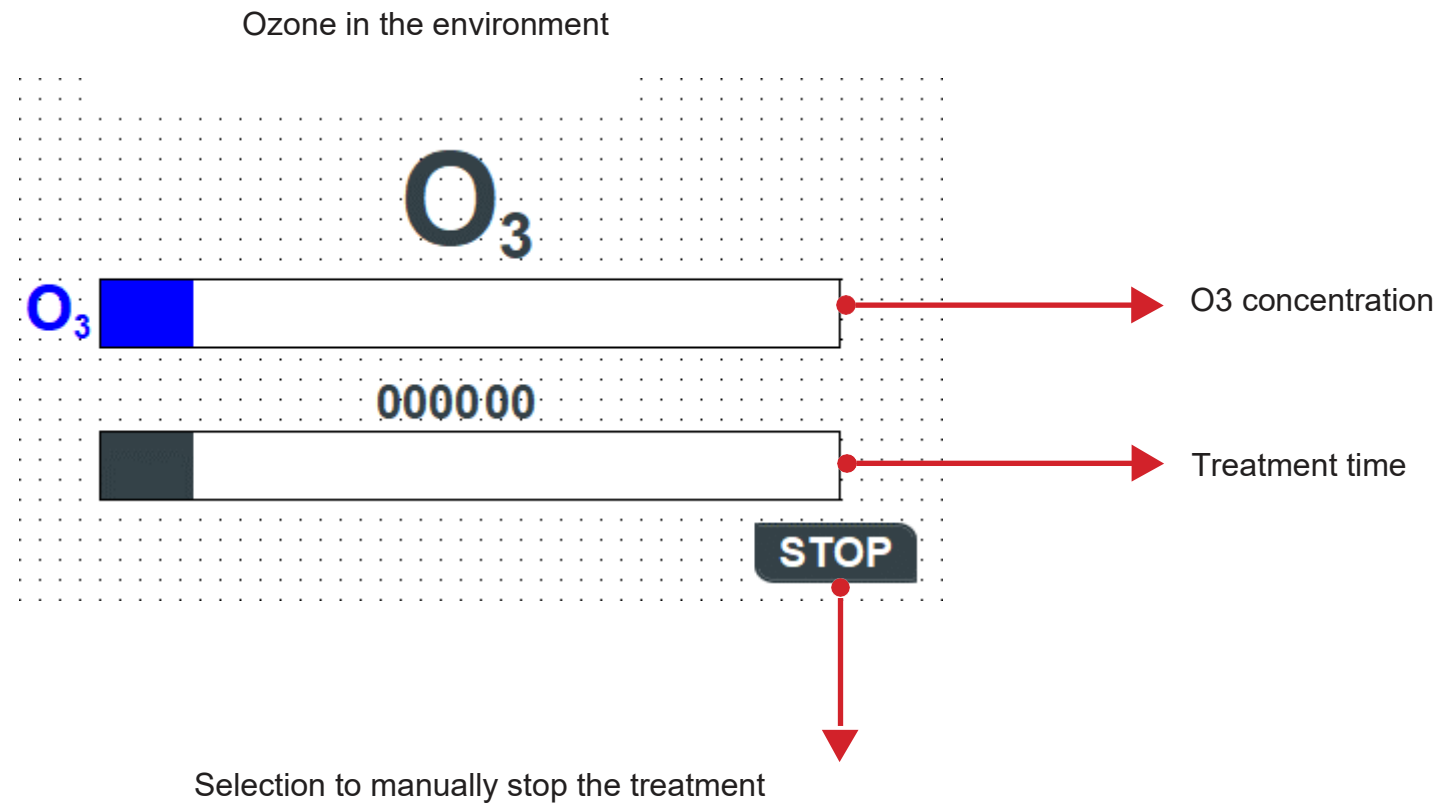


## TREATMENT SELECTION - O<sup>3</sup> - OZONE

OZONE - Ozone emission cycle for the time calculated on the basis of the size of the environment to be treated



## OZONE OPERATING SCREEN



## 13. POWER OFF

After each treatment, switch off the device by pressing the switch on the back of the unit.



Warning: When the device is not in use, the switch must be in "O" mode and the plug always disconnected.

## 14. WARNING MESSAGES

The COMBO 3 device signals that aspiration is not completed if for some reason the ozone aspiration phase has been interrupted from the environment.

**ASPIRATION  
NOT  
COMPLETED**

## 15. WARNING MESSAGES

The COMBO 3 device signals a possible fan block.

FAN #1 Blocked - Activated carbon side aspiration fan is blocked

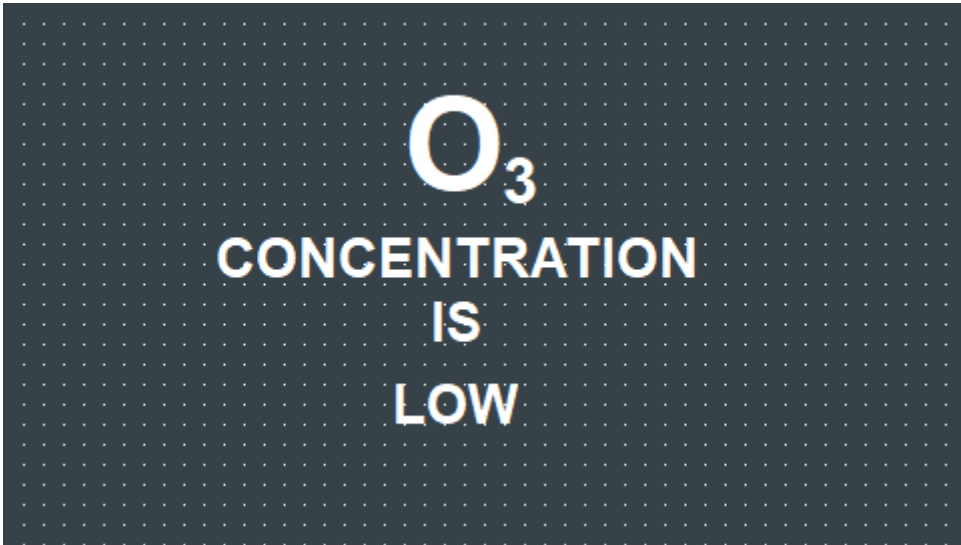
FAN #2 Blocked - The aspiration fan on the dust filter side is blocked  
(See page 18, ventilation grilles)

**FAN  
#1  
BLOCKED**

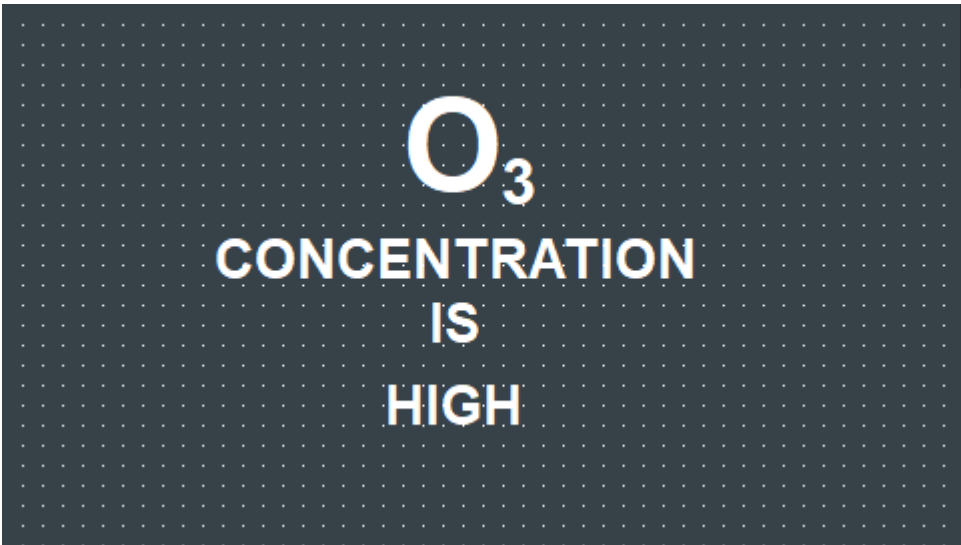


## ALARM MESSAGES (continued)

The COMBO 3 device signals a possible ozone concentration too low or too high in the environment, in both cases an unforeseen situation has occurred and a verification of ozone generation in case of too low concentration or a verification of ozone aspiration in case of too high concentration is required.



**O<sub>3</sub>**  
**CONCENTRATION**  
**IS**  
**LOW**

A dark blue rectangular panel with a fine white dot grid pattern. The text is centered and rendered in a bold, white, sans-serif font.

**O<sub>3</sub>**  
**CONCENTRATION**  
**IS**  
**HIGH**

A dark blue rectangular panel with a fine white dot grid pattern. The text is centered and rendered in a bold, white, sans-serif font.

## 16. ORDINARY CLEANING

### Cleaning the equipment

Periodically clean the external body of the equipment with a cloth on which we have previously sprayed a normal neutral alcohol-free detergent, avoiding direct spraying.

## 17. ROUTINE MAINTENANCE

To ensure optimal operation of the equipment, follow the guidelines given here:

1. Check the power cord periodically to see if there are any problems.
2. Do not drop the equipment on the floor or other hard surfaces. This can cause permanent damage
3. Do not twist or pull the power cord.

For any intervention, call Mesotech and do not open or tamper the device.

## 18. FUSE REPLACEMENT

You can replace the fuses in case of a break.

Fuses may only be replaced by an authorised technician.

Proceed as follows:

- Turn off the device
- Remove the power cord
- Open the fuse box
- Remove the fuses with a screwdriver
- Insert new Type 5X20F Fast 2A Fuses
- Close the fuse box
- Connect the power cord
- Turn on the device



## 19. INFORMATION FOR REORDERS

Contact Mesotech S.r.l distributors to purchase new accessory filters and/or other material necessary for the use of the machine.

DESCRIPTION	CATALOGUE/ REORDER NUMBER
CYLINDRICAL ACTIVATED CARBON FILTER	CAR.2815
CYLINDRICAL FILTER (AIR FILTRATION)	CAR.2816

## 20. PREVENTIVE MAINTENANCE

Preventive maintenance work	Frequency	Authorized person	Materials needed
Housing cleaning*	When required	User	Cloth + detergent
Check the status of the power cord	Before each use	User	--
General check of the manufacturer (Check-up)	Every year	Authorized technician	--
Periodic check and calibration	During the annual check-up	Authorized technician	--
Replacement of ozone generation filters (Zeolite)	Every 1000 working hours and/or 1 year (What occurs first)	Authorized technician	--
Replacement of ozone depletion filters (activated carbon)	Every 500 working hours and/or 1 year (What occurs first)	User	--
Replacing dust filters	Every 500 working hours and/or 1 year (What occurs first)	User	--

\* Don't spray the detergent directly on the casing.



### Combo 3 and disposal of accessories

Under Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE)

The crossed-out wheeled bin symbol on the appliance or on its packaging means that at the end of its life cycle the product must be disposed of separately from other waste and therefore the user must hand over the old appliance to the authorised waste collection centres for electronic and electrotechnical waste, or it must be returned to the dealer when a new unit of the same type is purchased. If the device is used in your business, you can ask the supplier or Mesotech S.r.l. to take back the old device in the way agreed when the new device is released. Correct waste disposal and compliance with these instructions help to prevent any negative effects on the environment and public health and also helps to recycle the materials from which the appliance is made. Incorrect disposal of the appliance will result in administrative sanctions being imposed on the user involved by the regulations in force.

PROBLEM	SOLUTION
<b>You can't turn the system on.</b>	<ol style="list-style-type: none"> <li>1. Make sure that the power cord is plugged in correctly and that the voltage of the system and the plug match.</li> <li>2. Disconnect the power cable, wait 3 minutes, check the fuses in the power box. The fuses are located in two separate containers that must be removed from the box to replace the broken ones with new ones of the same energy.</li> <li>3. Try to turn the system on again, if not, please contact our technician.</li> </ol>
<b>Nothing happens when you press START</b>	<ol style="list-style-type: none"> <li>1. Turn off the machine, wait a couple of minutes and turn the system back on.</li> <li>2. If it does not turn on, please contact our technician.</li> </ol>
<b>I have pressed START, but the fans do not start or I do not feel any air coming out when I put my hand on the outlet grille.</b>	<ol style="list-style-type: none"> <li>1. Check that the inlet and outlet grilles are free of obstacles or constraints.</li> <li>2. Turn off the machine, wait a couple of minutes and turn the system back on.</li> <li>3. If it does not turn on, please contact our technician.</li> </ol>
<b>When I press the controls on the control panel, the screen does not proceed to the next page.</b>	<ol style="list-style-type: none"> <li>1. The microprocessor driving the system may be blocked.</li> <li>2. Turn off the machine, wait a minute and then turn it back on again.</li> <li>3. If you do not notice any changes, please contact our technician.</li> </ol>

For any other malfunction, call Mesotech and do not open or tamper with the device.

## 22. MANUFACTURER'S DECLARATION

Tables 1, 2, 4, 6, 9 with reference to EMC Directive 2014/30/EU


tab. 1

Information and manufacturer's declaration - Electromagnetic emissions		
<b>The Device is designed to operate in the electromagnetic environment specified below. It is the responsibility of the customer or user to ensure that it is used in such an environment.</b>		
Verification of Emissions	Compliance	Electromagnetic environment
RF emissions CISPR 11	Group2	The device must emit electromagnetic energy to perform its intended functions. Electronic equipment in the vicinity may be influenced by it.
RF emissions CISPR 11	Class A	The emission characteristics of this device make it suitable for use in industrial environments and hospitals (CISPR 11 class A). When used in a residential environment (for which CISPR 11 class B is normally required) this device may not provide adequate protection for radio-frequency communication services. The user may need to use mitigation measures, such as repositioning or reorientation of the device.
Harmonic emissions IEC/EN 61000-3-2	Class A	
Harmonic flicker emissions IEC/EN 61000-3-3	Complies	

tab. 2

Proof of immunity	Test level IEC 60601	Compliance level	Electromagnetic environment
ESD Electrostatic discharge IEC 61000-4-2	± 8 kV contact ± 2,4,8,15 kV in air	± 8 kV contact ± 2,4,8,15 kV in air	Floors must be made of wood, concrete or ceramic tiles. If floors are covered with synthetic material, the relative humidity must be at least 30%.
Burst Transitor/ electrical pulse sequence IEC 61000-4-4	± 2 kV Repetition frequency 100KHz	± 2 kV Repetition frequency 100KHz	The quality of the mains voltage should be that of a typical commercial or hospital environment.
Surge Power Surges IEC 61000-4-5	± 0.5 , 1 kV phase(s)-phase(s) ± 0.5, 1, 2 kV phase (i)-ground	± 0.5 , 1 kV phase(s)-phase(s) ± 0.5, 1, 2 kV phase (i)-ground	The quality of the mains voltage should be that of a typical commercial or hospital environment.
Voltage dips, short circuit breakers and voltage variations on input lines feed IEC 61000-4-11	0% Ut for 0.5 periods angle 0°;45°;90°;135°;180°;225°;270°;315°. 0% Ut; 1 period and 70% Ut; 25/30 periods 0% Ut; 250/300Single-phase: 0° periods	0% Ut for 0.5 periods angle 0°;45°;90°;135°;180°;225°;270°;315°. 0% Ut; 1 period and 70% Ut; 25/30 periods Single-phase: 0° 0% Ut; 250/300 periods	The quality of the mains voltage should be that of a single commercial or hospital environment. If the user of the device requires continuous operation even during the interruption of the voltage of It is recommended to power the device with an uninterruptible power supply or batteries.
Magnetic field at mains frequency (50/60 Hz) IEC 61000-4-8	30 A/m	30 A/m	Network frequency magnetic fields must have levels characteristic of a typical location in a commercial or hospital environment.

tab. 4

Proof of immunity	Test level IEC 60601	Level compliant	Electromagnetic environment (distance of a transmitter from the equipment)
RF conduct IEC 61000-4-6	3 Veff (0.15MHz to 80MHz) 6 Veff In ISM band (0.15 to 80MHz) 80% AM at 1KHz	3 Veff (0.15MHz to 80MHz) 6 Veff In ISM band (0.15 to 80MHz) 80% AM at 1KHz	<p>Portable and mobile RF communications equipment shall not be used closer to any part of the device, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.</p> <p><b>Recommended separation distance (d)</b></p> $d = \frac{1}{E} \sqrt{P}$ <p>Where P is the maximum rated output power of the transmitter in W according to the transmitter manufacturer and E is the IMMUNITY TEST LEVEL in V/m.</p>
Radiated RF IEC 61000-4-3	3 V/m (80MHz to 2.7GHz)  80% AM at 1KHz	3 V/m (80MHz to 2.7GHz)  80% AM at 1KHz	<p><b>Recommended separation distance</b></p> <p>See Table 6 and 9</p> <p>The field strength of fixed RF transmitters, determined by an electromagnetic site survey (a), should be below the compliance level in each frequency range. (b)</p> <p>Interference may occur near equipment marked with the following symbol:</p> 

NOTE 1: At 80 MHz and 800 MHz, the higher frequency range applies.

NOTE 2: These guidelines may not be applicable in all situations. Electromagnetic propagation is affected by the absorption and reflection of structures, objects and people.

- (a) The field strength of fixed transmitters, such as base stations for radio (mobile / cordless) and terrestrial mobile radio, amateur radio, AM and FM radio broadcasts and TV broadcasts cannot theoretically be predicted precisely. To assess the electromagnetic environment due to fixed RF transmitters, an electromagnetic site survey should be considered. If the field strength measured at the location where the Device is used exceeds the applicable RF compliance level indicated above, you must observe the operation of the Device, additional measures, such as reorienting or repositioning the Device itself, may be necessary.
- (b) In the frequency range from 150KHz to 80MHz, the field strength must be less than 10V/m.
- (c) ISM: (Industrial, Scientific, and Medical) bands between 150KHz and 80MHz are: 6,795 MHz; 13,553 MHz to 13,567 MHz; 26,957 MHz to 27,283 MHz; and 40,66 MHz to 40,70 MHz. The amateur radio bands between 0,15 MHz and 80 MHz are 1,8 MHz to 2,0 MHz, 3,5 MHz to 4,0 MHz, 5,3 MHz to 5,4 MHz, 7 MHz to 7,3 MHz, 10,1 MHz to 10,15 MHz, 14 MHz to 14,2 MHz, 18,07 MHz to 18,17 MHz, 21,0 MHz to 21,4 MHz, 24,89 MHz to 24,99 MHz, 28,0 MHz to 29,7 MHz and 50,0 MHz to 54,0 MHz.

**tab. 6**

The device is designed to operate in an electromagnetic environment where radiated radio frequency interference is controlled.

The patient or family using the Comb03 device can help prevent electromagnetic interference by ensuring the minimum distance between any mobile and portable radio frequency communication device and the Comb03 unit, as indicated below based on the maximum output power of the radio communication device

Maximum specified output power of the transmitter (W)	Separation distance to frequency transmission (meters)		
	From 15 kHz to 80MHz	From 80MHz to 800MHz	from 800MHz to 2.5GHz
0.01	0.3	0.3	0.3
0.1	0.37	0.37	0.74
1	1.17	1.17	2.33
10	3.69	3.69	7.38
100	11.67	11.67	23.33

**Attention**

**Mobile, radio frequency communication devices (including cables for antennas and external antennas) must not be used closer than 30cm (12 inches) to any part of the device, including the cables specified by the manufacturer. Failure to do so may degrade the performance of the device.**



Dear customer,  
Thank you for your attention.  
We confirm our full availability for any support or advice you may need.



Appliance manufactured by: Mesotech S.r.l.  
Via Mazzini 54 – 80022 Arzano (NA) ITALY tel.  
+39 (0) 815736072 - 4618340  
[www.mesotech.it](http://www.mesotech.it)