airBee

AIR AND SURFACE SANITIZING DEVICE

HOME

USE AND MAINTENANCE MANUAL

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(Editing)	(Date)	(Version)	(Project)

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1 Company name, address of the manufacturer and introduction

Machine manufacturer's data:

AIR – BEE S.r.l. Via Colico, 10 - 20158 – MILANO - P.IVA 10755150967

This document represents the use and maintenance manual of the HOME device, used to sanitize the air through a photocatalysis process that prevents microorganisms such as viruses, molds and / or particles of "dirt" from being able to create risk conditions for human health. It is not among the objectives of this document to provide a detailed description of what the photocatalysis process is, but it is mandatory to provide a brief description so that it is possible to fully understand the benefits of the machine in question. The photocatalysis process is based on a photocatalytic oxidation process (UV-PCO) generated by the combined action of the rays emitted by the UV lamp and a photocatalyst structure, titanium dioxide (TiO2), called photocatalyst. We are in the presence of a natural process as photocatalysis is a phenomenon where the photocatalyst (Titanium Dioxide - TiO2), due to the effect of natural and / or artificial light, speeds up a reaction, effective in microbial destruction, which leads to the decomposition of organic substances pollutants (VOC) reducing them to harmless products such as carbon dioxide (CO2) and / or water (H2O). The AirBee device ensures the destruction of bacteria, molds, odors, dust, ... or "dirty air" that is generally created in closed environments. Added to this is a correct electrical balance of the air which helps a lot to fight problems such as headaches, insomnia, irritability, allergies, ... etc. The purpose of this manual is to provide the necessary instructions to avoid serious damage to oneself or to others as a result of incorrect use of the machine. It is essential to follow the warnings and all the basic procedures for a correct use of the machine.

Read this use and maintenance manual carefully before using it and / or for any work or routine / extraordinary maintenance. Carefully observe the labels, pictograms and indications affixed to the machine, as well as plates or cards showing the technical and / or performance characteristics of the machine. Consultation of the manual as well as the instructions for use and maintenance imply, in addition to the indications for correct use, knowledge of the capabilities and limits of the machine. For these reasons, the manual must always be consulted by those who will use, assemble and disassemble it. This document, together with the EC declaration of conformity, is an integral part of the supply of the machine and all the prescriptions and indications contained are mandatory.

The user is directly responsible for the machine's operation .

1.1 Update of the user's manual

The manual reflects the state of the art of the device relative to the reference period of its design and construction. Therefore, it is an integral part and complies with all laws, directives and mandatory standards. Any changes, adjustments or anything else do not oblige the manufacturer to intervene on what was previously provided or to consider the machines previously sold and the related manual lacking or inadequate. Possible additions that the manufacturer deems appropriate to send to users must be kept together with the previous manual to which they refer.

1.2 Warranty

2 The definition of the warranty terms for AIRBEE devices is determined according to the general conditions of supply. The warranty does not cover items that have been repaired, modified (even partially) or replaced by non-original and / or unauthorized spare parts. The warranty will not be valid if the defects are due to incorrect measures, negligence, carelessness or in case of alteration and / or repairs carried out by unauthorized persons. It follows that the manufacturer will not be liable in any way for damage caused to people or things due to incorrect use of the machine or for structural modifications, applications or unauthorized transformations. Below are some of the mandatory requirements for the use of the warranty:

- Always work within the limits of use of the equipment;
- Always carry out constant maintenance;
- Employ adequately trained personnel with proven ability and aptitude for cleaning and maintenance of the machine.

The manufacturer declines any and all responsibility for:

- Failure to observe the instructions contained in this use and maintenance manual;
- Use of the device by anyone who has not read and fully understood the contents of this document;
- Modifications and / or repairs not expressly authorized by the manufacturer;
- Use of non-original or non-specific spare parts;
- Bad cleaning and / or maintenance of the device;
- Exceptional events not attributable to the operation of the device

The transfer of the machine to another user also includes the delivery of the manual. Failing that, not being able to acquire information on the correct use of the device, all liability on the part of the manufacturer, including any warranty, will be void.

2.1 Summary of symbols and terminology used in this manual

The symbols and acronyms used in this document are shown below. The symbols, shown in (Fig.1.1.1), is adopted in the presence of a potential dangerous condition or to inform the user of risk conditions

	**GENERIC DANGER** It indicates that the described operation presents, if not carried out in compliance with safety regulations, a source of possible injury or damage to persons.
	**DANGER OF ELECTRIC SHOCK** it warns the user that the described operation presents, if not carried out in compliance with safety regulations, a source of possible injury or damage to persons resulting from electric shock.
	**EX (DANGER EXPLOSIVE ATMOSPHERE)** It highlights the risk of the explosion due to the presence of explosive atmospheres.
	**NOTE** It warns the user that the content of the information reported is of significant importance. Therefore, damage to the various parts of the machinery may

	occur.
	**WARNING** Alerts the reader to a dangerous situation that could cause minor injuries.
	**MACHINE OPERATOR OR DRIVER** Identifies qualified and professionally trained personnel who, in compliance with the legislation in force in the country where the operation is performed, are authorized to carry out only switching on, using, setting up (obligatorily with the protections enabled and the machine off) and switching off machine in full compliance with the instructions contained in this manual, equipped with the personal protective equipment (PPE) provided. It is strictly forbidden for the Operator to perform operations that are associated with the responsibility of the maintenance technician.
	**OPERATOR IN CHARGE OF HANDLING** This is a qualified and professionally trained operator who, in compliance with the legislation in force in the country of use, is authorized to operate forklifts, bridge cranes or cranes, to carry out the transport and handling of materials in safety. Equipped with the required personal protective equipment (PPE).
	**MECHANICAL MAINTENANCE TECHNICIAN** A qualified technician authorized to perform interventions exclusively on mechanical parts to carry out maintenance and / or repairs in absolute compliance with the instructions contained in this manual. Equipped with the required personal protective equipment (PPE). *Dota*
	**ELECTRICAL MAINTENANCE ENGINEER** (*See EN 60204-1:2006*) Qualified technician (electrician in possession of professional technical requirements recognized under current legislation), authorized to perform

	interventions exclusively on electrical devices to carry out adjustments and maintenance in absolute compliance with the instructions contained in this manual. Equipped with the required personal protective equipment (PPE).
	**OBLIGATION TO READ THE MANUAL** Obligation to read the Safety Prescriptions and in particular the entire use and maintenance manual.
	**EXTRAORDINARY INTERVENTIONS** Any maintenance operations highlighted by the symbol alongside must be requested from the manufacturer.
Fig.1.1.1 – Symbols	

The person who maintains the device is responsible for compliance with basic safety measures such as the use of personal protective equipment, to be worn for necessary safety reasons.

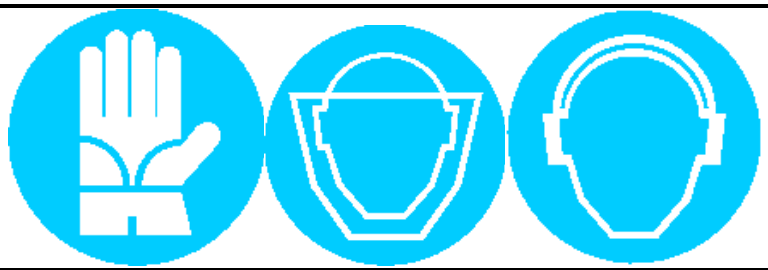

Fig.1.3.2 – Examples of PPE symbols (Personal Protective Equipment)

In (Fig.1.3.2) the symbols relating to the Personal Protective Equipment (PPE) that you will have to use during maintenance activities is indicated, although its modest size could lead to think that safety equipment such as PPE is not necessary. Below is a brief description of them:

1. **Cut resistant safety gloves / Insulating gloves.** There are many types of this product on the market. Regardless of the brand chosen, it is essential that they are equipped with CE marking and that they perform the characteristics of insulation and protection from any punctures, cuts and abrasions to hands. The choice of the type of function (whether anti-cut or insulating) is left to the maintenance technician. Although the machine has been designed and built to prevent this risk condition, the use of PPE serves to completely eliminate any residual risks;

2. **Face mask with visor / safety goggles.** This device represents a useful means of protection against risks deriving from any material being discharged due to moving parts towards the face and / or eyes. During the design, construction, analysis and risk assessment phases, the risks associated with this risk condition have been resolved, therefore by wearing this PPE it is also possible to eliminate the residual risks;
3. **Earmuffs.** The machine does not produce a high value of noise but it is necessary that the workers, delegated to the maintenance operations, always wear ear plugs to reduce any residual risks due to noise, above the threshold value of 80dB.

The operator must always remember that the machine components can cause situations of  ***danger. You must not intervene on them without making sure that you have previously disconnected the power supply.***

2.2 DEFINITIONS

Definizione	*Descrizione*
Anisotropy	Characteristic of metal products that expresses sheet resistance to thinning during deformation.
Anti vibration	Materials used to isolate the device from the support structures so that the mechanical vibrations do not propagate, but are absorbed by these supports (anti-vibration) in the shortest possible time.
AOPD (EN 16092-1:2018)	(**Active opto-electronic protective device**). Device whose detection function is performed by emitting and receiving optoelectronic elements which detect the interruption of the optical radiation, generated by the same device, by means of an opaque object present in the specified detection zone.
Electrical Arc	the electrical arc occurs when electricity tries to bypass a gap in a conductor causing a "high-temperature light electrical discharge". The arc current literally jumps through an air gap. The air is ionized and the arc is maintained until the power is turned off by a protective device. The arc temperature is several thousand degrees and varies with voltage drop, current and conductor type.
Spacer Barrier	Shelter that does not completely enclose a dangerous area, but which prevents access due to its size and distance from the dangerous area, for example a perimeter fence or a tunnel shelter (UNI EN ISO 12100: 2010).
Burr	Defect caused by the shearing of the sheet
Protection Carter	Protective structures designed to protect against potentially dangerous moving parts.
ESPE (EN 16092-1:2018)	(**Electro-sensitive protective equipment**). Electro-sensitive protective equipment. Set of devices and / or components that work together to obtain protection activation or presence detection, which includes: • A detection device; • Control of monitoring devices; • Output devices; • All interconnect cables
Machine	Hereinafter, this term will refer to the machine, object of this document
MQTTN	Message Queue Telemetry Transport. Born 20 years ago with the aim of managing machine to machine connections, that is, to enable communication between machines in an extremely efficient manner. The main features of MQTT are that of being a simple and light protocol for exchanging messages, as well as minimizing traffic on networks and requiring few resources from devices

	for its management. The person (s) in charge of installing, operating, adjusting, cleaning, repairing and moving or maintaining a machine
Operator	The person (s) in charge of installing, operating, adjusting, cleaning, repairing and moving or maintaining a machine. .
Exposed person	.Any person who is wholly or partially in a danger zone.
PFH	Probability of Failure per Hour
PLC	Programmable Logic Controller – - Programs and processes the digital and analog signals from the sensors present in the system.
Work place	Position occupied by a worker during the performance of his duties.
Guard	Physical barrier, designed as part of the machine, to provide protection (UNI EN ISO 12100: 2010).
Total segregation Guard	
Fixed Guard	Fixed guard that prevents access to the dangerous area from all sides (UNI EN ISO 12100: 2010). Guard fixed in such a way (for example by screws, nuts, welding) that it can be opened or removed only by using tools or by destroying the means through which the guard is fixed (UNI EN ISO 12100: 2010 point 3.27.1).
Interlocked Guard	Guard associated with an interlocking device so that, together with the machine control system, the following functions are performed: ● • The dangerous functions of the machines “treated” by the guard cannot be activated until the guard is closed; ● • If the guard is open while dangerous machine functions are running, a stop command is sent; ● • When the guard is closed, the dangerous functions of the machine “treated” by the guard can work (closing the guard does not in itself initiate the dangerous functions of the machine); (UNI EN ISO 12100: 2010 point 3.27.4).

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Mobile Guard	Shelter that can be opened without the help of tools (UNI EN ISO 12100: 2010 point 3.27.2).
Motorized Guard	Mobile guard operated by an energy source other than human or by gravity (UNI EN ISO 12100: 2010).
Adjustable Guard	Overall adjustable guard or that integrates one or more adjustable parts (UNI EN ISO 12100: 2010 point 3.27.3).
Risk	Combination of the probability and severity of an injury or damage to health that may arise in a dangerous situation.
Sensor	DDevice that transforms the physical quantity in input into a signal that can be received by a receiving electronic station (e.g. PLC)
Safety	The common term for protective measures in which a person or object is monitored. .
Machine Safety	This has been achieved once measures have been taken to reduce the risk to an acceptable residual risk after the risk assessment has been performed. .
Stop systems	Devices for the immediate stop of the machine in case of emergency.
Dangerous Area	Any area inside and / or near the machine where the presence of a person constitutes a risk for the safety and health of that person.

2.3 Intended use of the machine

The machine in question is an air sanitizing device which, installed in rooms with adequate ventilation, allows an effective and quick neutralization of: viruses, germs, pollen, bacteria, spores, molds, cigarette smoke, unpleasant odors, … Including the removal of suspended particulates. The elimination of unpleasant odors is made possible thanks to the neutralization of bacteria and germs. Environmental sanitization is an activity aimed at eliminating bacteria and pollutants that cannot be removed through the usual cleaning and detergents. It also allows the microbial and viral load to be brought back within optimal hygiene standards. With the AirBee devices, sanitization is conceived as an ordinary activity because although we do not notice it, the air we breathe every day in the rooms is

contaminated, including the ventilation and / or conditioning systems. The advantages of constant sanitization, in any season, involve, in addition to compliance with current regulations, also the improvement of work performance and environmental sanitization in small, medium and large meeting places.

Fig.1.5.1 - Air intake into the device

The air is introduced into the sanitation system through a fan (Fig.1.5.1). Once it has entered the sanitizing chamber, the air is purified, becoming clean air, where the bacterial and microbial load is drastically reduced by the action of the photocatalysis produced by the components of the device (UV lamp + titanium dioxide photocatalyst) shown in Fig.1.5 .2. The AirBee air device is especially effective inside small and medium-sized rooms (for large spaces it is possible to connect multiple devices, connected to each other, thus increasing their range of action), with high probability presence of polluting loads such as:

Fig.1.5.1 – Air intake into the device

- Small, medium and large homes (network of multiple devices);
- Emergency Rooms;
- Medical and / or dental offices;
- Hospital rooms;
- Shelters for the elderly;
- Analysis laboratories;
- Hotel rooms;
- Classrooms;
- Toilet;
- Waiting rooms;
- Libraries;
- Etc.

The following slide shows the direction of the air flow which, once it enters the device, will be sanitized and reintroduced into the environment without the volatile substances harmful to the human body. As passive filtration devices there are very high efficiency HEPA filters (absolute filters) of class H13 for the interception of PM2.5 - PM10 dust. For active filtration there is a filter coated with titanium dioxide (TiO2), for a further phase of photocatalysis. As can be seen from Fig.1.5.2 on the device there are two catalysts, the first honeycomb with the sole function of photocatalysis. The second, in addition to the task of preventing the passage of fine dust, also has the function of sanitizing the air through the well-known process of photocatalysis.

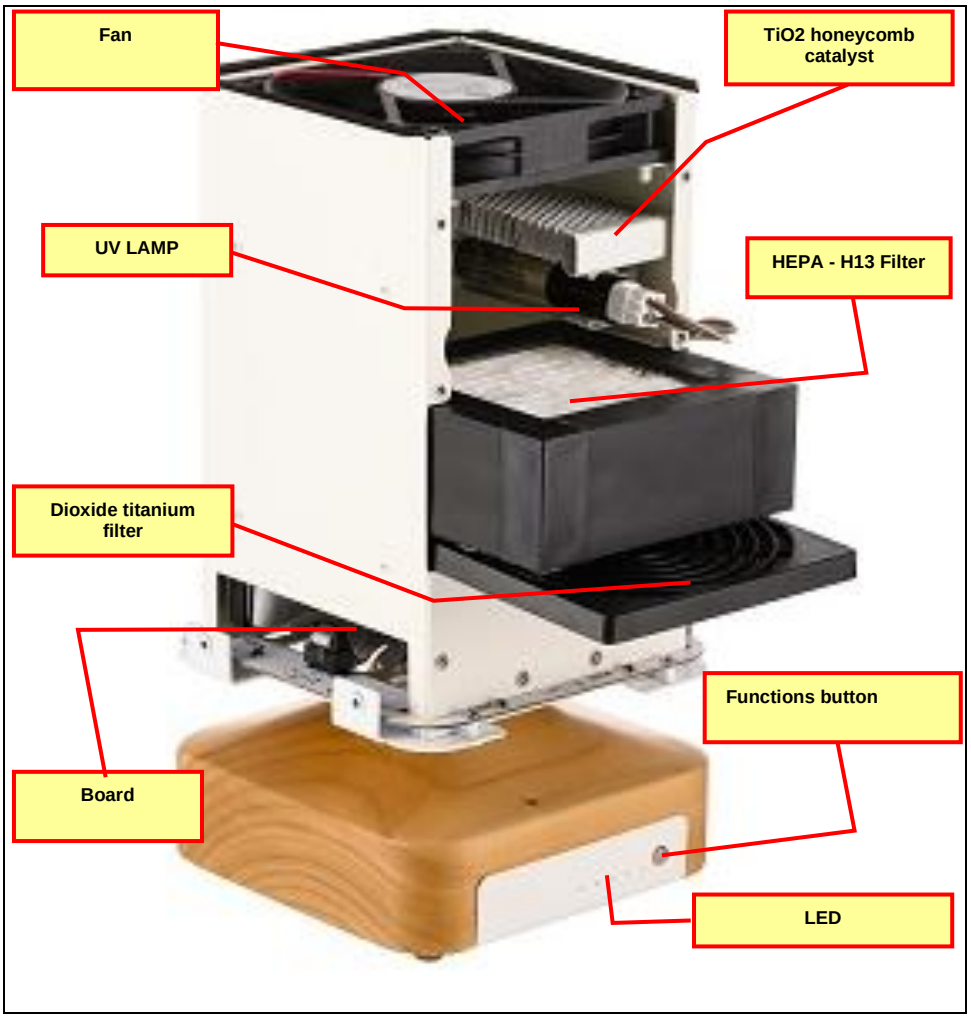

Fig.1.5.2 – Air Sanitization Circuit

2.4 Education / training of maintenance workers

The main purpose of this document is to bring the user of the device closer, in a simple and gradual manner, to the legislation for the prevention of accidents and to those rules of conduct that are the basis for a correct and safe use of the device (Essential requirements for safety required by the applicable directives and harmonized standards). To prevent, as far as possible, the occurrence of accidents, the user must have read and understood this manual. The legal provisions (Directives and harmonized standards associated with them) to which we have referred, during the design and construction of the machine, are listed in the following paragraph. Their study is a good exercise for those who wish to broaden and / or study this topic.

The manual, translated into languages other than Italian, will be made available at the following web address: http://www.air-bee.it/manuali-uso-e-manistenza/. As far as device configuration is concerned, the tutorials, in the form of videos, will be downloadable and / or viewable at the link: http://air-bee.it/guida-installation/.

2.5 Reference standard

The directives, used for the CE marking of the air sanitation device, are:

- 2006/42 / EC - Machinery Directive;
- 2014/30 / CE - Electromagnetic Compatibility Directive (EMC);
- 2014/35 / EC - Low Voltage Directive (LVD);

In this regard, the safety information and requirements contained in this use and maintenance manual must always be respected as they are absolutely binding for the correct use of the machine. All CE marked devices are accompanied by the declaration of conformity (a copy is given in Chapter 3) with which the manufacturer guarantees the compliance of the device with the essential safety requirements. In addition to the directives, the manufacturer has followed, during the design and construction phase, the following standards:

- **CEI EN 60204-1: 2018**: Safety of machinery - Electrical equipment of machines - Part 1: General rules;
- **EN ISO 12100: 2010**: Safety of machinery - General principles for design - Risk assessment and risk reduction;
- **IEC 60335-2-65**: 2002 + AMD1: 2008 + AMD2: 2015 - Household and similar electrical appliances - Safety - Part 2-65: Particular requirements for air purification appliances Risk assessment and risk reduction;
- **UNI EN ISO 14118**: 2018: Safety of machinery - Prevention of unexpected start-up;
- **ISO 11428: 1996**. Ergonomics - Visual warning signs - General references, design and testing;
- **UNI EN ISO 14120**: 2015 - Safety of machinery - Guards - General requirements for the design and construction of fixed and movable guards;
- **UNI EN ISO 13732-1**: 2009 - Ergonomics of thermal environments - Methods for evaluating human response to contact with surfaces - Part 1: Hot surfaces
- **ISO 28590: 2018** - Sampling procedure in the inspection by attributes - Introduction to the series of ISO 2859 standards for sampling in the inspection by attributes;

Against the CE marking, the machine is guaranteed for free circulation and use, within the European community. In addition to the declaration of conformity, there is a plate on the device (see Chapter 17) that uniquely identifies it, with the serial number. The facsimile of the CE plate is shown in the last chapter (Chap.17). The machines, produced by AirBee, are carried out adequate tests and inspections, designed during the prototype construction phase, in order to intercept any construction defects, malfunctions or other types of problems associated with the construction and safety of the machine and / or its users. Quality control during the production cycle is performed using the ISO 28590: 2018 standard using a high quality level (tending to 100%).

The devices are sampled and classified according to ISO 28590: 2019 and any defective devices are rejected. In the event that the number of defective pieces is greater than the maximum limit, the whole lot will be rejected and the defective devices will be destroyed.

Model

This document refers to a type of machine that meets the technical and functional requirements required by the market. The following table shows the characteristics of the AirBee air sanitization device.

Type	Model	year	Mass	Material	Switch On - Off	Height (mm)	Width (mm)	Length (mm)
RA	HOME	2020	10 Kg	Wood-Steel	Yes + Remote control	350	170	170

The machine consists of the following components

- Transformer IN 220VAC - OUT 12VCC 24VAC;
- # 1 Suction fan (Fig.1.5.1) for introducing air into the air sanitization circuit;
- Frame in wood and steel;
- Air inlet filters shown in Fig.1.5.2. HEPA filter of class H13 and fine mesh filter coated with titanium dioxide (Fig.2.2);
- # 1 Photocatalyst (Fig.1.5.2). Consisting of a large mesh filter coated with titanium dioxide (TiO2);
- # 1 UV lamp connected to a power supply (Ballast);
- Electronic card for the management of functions;
- LEDs, managed by the board, to provide visual information on the state of "pollution" of the air through a color ranging from red to green

Fig.2.2 – Internal filter coated with T_iO_2

Fig.2.2 shows the image of the antibacterial filter, a strip of mesh covered with catalyzing material (titanium dioxide TiO2), to increase the air purification capacity of the device.

2 EC declaration of conformity (Facsimile)

EC declaration of conformity N°01-2020

(Pursuant to the machine directive 2006/42/EC, Annex II letter A)

Milano (MI), _____

AirBee S.r.l.

Via Colico, 10
20158 Milano
P.IVA 10755150967

The person in charge of setting up the technical file and its detention are Messrs Pasquale Sannini and Gatti Luca, as legal representatives of AirBee S.r.

Declares that the machine

Type	**RA**	**Model**	**HOME**
Serial number	**HM 00001**	**Construction year**	**2020**
Total Mass	**10 Kg**	**Power supply**	**In 220V – Out 12V**

It complies with the requirements of the following European Directive:

2006/42/EU and subsequent modifications;

And from further European directives that follow:

- 2014/30/UE – EMC Electromagnetic Compatibility
- 2014/35/UE – LVD Low voltage
- 2011/65/UE – ROHS II

As well as the technical specifications and harmonized standards:

- CEI EN 60204-1:2018: Machinery safety – Electrical equipment of machines – Part 1: General rules;
- UNI EN 12100:2010 Machinery safety - General design principles –
- IEC 60335-2-65:2002+AMD1:2008+AMD2:2015 - Domestic appliances and similar devices - Safety - Part 2-65: Special requirements for air purification equipment. Risk assessment and risk reduction;

Manufacturer
(Legal Representative)

CE marking performed by the technical office Engineer. Luigi Palcone
Via Casa Manzo, 79 – 84135 Salerno
Registration with the register , Province of Salerno n° 6998
www.ingpalcone.it

3 General description of the machine and technical specifications

The device has been created, with different models, to best meet the air sanitization needs for the environments in which it has to operate. The HOME model has been studied and designed to be used in medical environments where the required performance level is high. The capacity of active and passive filtration allows an effective elimination of viruses, bacteria, molds, yeasts, "VOC" volatile organic compounds (such as: formaldehyde, benzene, alcoholene, ammonia, ...) and of fine dust, present in environments and on surfaces . It is equipped with sensors, tested by the ENEA laboratories, which are connected to an electronic board, to detect the air quality or temperature, humidity, PM2.5, PM10, and VOC, present in the environment where the device is in operation.

Fig.4.1 – inlet filter H13

The detection of pollutants, temperature, humidity, ... is performed by sensors whose reliability and accuracy is guaranteed by the technology used as well as by the declaration of conformity of the hardware manufacturer. The AirBee air sanitization device makes use

of innovative technology without causing damage to the health of users. Fig.4.1 shows the image of the narrow-mesh HEPA filter with high filtration performance characteristics for fine dust.

It is advisable to periodically clean the filter in order to always have optimum performance to prevent suspended dust particles from being inhaled.

Fig.1.5.2 shows the main components of the machine and in particular:

- **Filters**, easily removable, can be quickly cleaned of the impurities they have intercepted, sucking up the suspended particulate. Their purpose is to prevent the passage of dust and / or impurities with a diameter greater than that of the filter mesh;
- **Air intake fan**, passing it through the above filters, and to let the sanitized and filtered air out from the side openings;
- **The UV lamp** is powered through a ballast and together with the catalyst (Titanium Dioxide) make up the photocatalysis group;
- **Machine frame** made of wood and steel covered with epoxy paint, for chemical-physical protection, thanks to a film or film that covers the surface, also improving the mechanical resistance of the frame itself.

Warning! Never open the device when the power supply is live. Possible risk of electrocution due to the presence of 220VAC

With regard to the protective casings, on the other hand, the next Chapter 7 describes the safety devices that comply with the regulations in force relating to the machine as well as protect the user from moving parts, potentially hazardous.

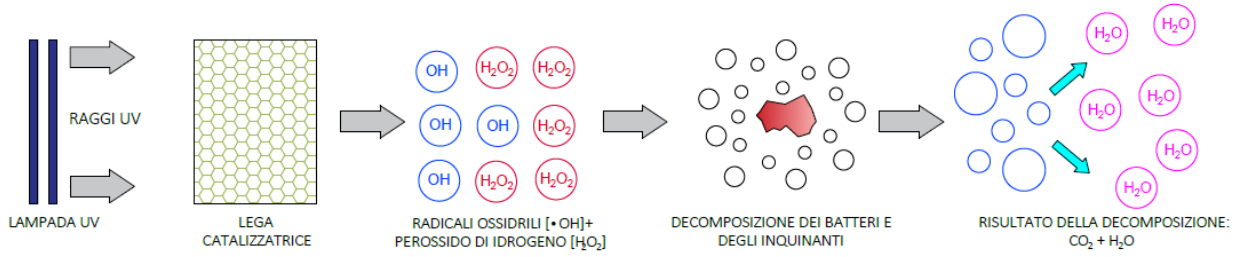

Fig.4.2 – Scheme of the photocatalysis process

AirBee devices for air sanitization, through the PCO (Photocatalytic Oxidation) / photocatalysis process, destroy the molecular structure of bacteria, viruses and molds. This completely innovative photocatalysis process produces extraordinary results without having to resort to chemical preparations or ozone which in large percentages, due to the large consumption of oxygen, cannot be used in the presence of people

The device, in AUTO mode, provides for an uninterrupted cycle of 6 h of sanitization and 1h of stand-by (programmed indefinitely). This suspension, provided for by the system, is visible through the front "OFF" red led and the orange "AUTO" led. However, the cooling system will remain active.
As regards operation in "SLEEP" mode, a 3h continuous sanitization cycle is envisaged, following which the blue front LED will light up, with the consequent shutdown of the machine.
In "Speed 1" and "Speed 2" mode, the device - after having carried out a complete and impeccable sanitization of the environment for 8h - activates the "auto - power off" mode, which means it automatically switches off, which is also visible via the red "OFF" front led.
These functions are visible via the App, if the device is connected in Access Point or MQTT mode, through a graphic pop-up.

I The programs indicated, in addition to ensuring effective sanitization, result in energy savings, while respecting the environment.

3.1 Operation via APP

Thanks to the simple and functional "AIR BEE Home" APP, which runs on both Android and iOS systems, the user can also receive information from their smartphone as well as set the different operating modes that the platform provides. The devices are compatible with the latest versions of Android and IoS, they are also compatible with all the latest generation routers. Below is a brief description of the expected functions:

- **ON / OFF**. Turning the device on and off;
- **AUTO**. With this function the device adjusts itself, varying the fan speed according to the air quality detected by the probes within the area where the device is used;
- **SLEEP**. This function minimizes the fan speed and turns off the LED to reduce the sound and visual impact with the user;
- **I and II speed**. According to your needs;

As shown in Fig.1.5.2, the user can have a visual indication of the state of air pollution thanks to an integrated LED system which, with a color ranging from green to red, provides the user with knowledge of the concentration status of pollutants.

3.2 Manual operation

The automatic function, via the app, is accompanied by a manual function, which can be activated using the front button and / or the remote control supplied with the machine and shown in Fig. 4.2.1. The features provided for the manual mode are the following:

Speed_1. UV lamp on, fan with medium speed and visual communication LEDs on;

Speed_2. UV lamp on, maximum fan speed and visual communication LEDs on;

SLEEP. UV lamp on, minimum fan speed, visual communication LEDs off and the front ones off;

AUTO. UV lamp on, automatic fan speed, visual communication LEDs on;

OFF. the fan varies the speed according to the air quality detected by the probes inside the room.

N.B. The IR command can interfere with other devices that have similar IR codes

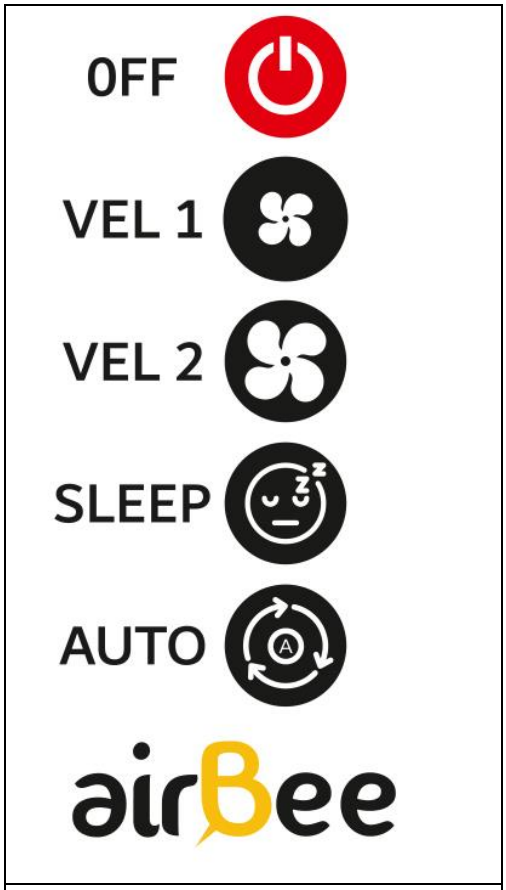

Fig.4.2.1 – Remote Control

3.3 Factory Default

At the rear, as shown in Fig.1.5.2, the HOME device has a hole of about 1mm in diameter. Using a thin tip like that of a toothpick, it is possible to lightly press the button located inside this hole (Fig.4.3.1). This is the RESET or Factory Default button or the command to restore the device with the initial or factory values. In fact, by keeping this pressure for at least 10 seconds, the Wi-Fi card, located inside the motherboard, is brought back to Access Point mode with the initial SSID (this value can also be observed from the list of available Wi-Fi signals in the network). This operation can be useful both in case of errors in the network name (SSID), such as homonymy problems, or to restore previous logins due to incorrect or forgotten passwords and so on.

Fig.4.3.1 – Reset

3.4 Detail of visual signaling LED

On the front and at the bottom, as shown in Fig.1.5.2, there are LEDs designed for visual signaling, in compliance with the requirements of directive 93/42 / EEC. The possible combinations of lights are described below so that the user can have an immediate understanding of the meaning of the different light combinations that are emitted by the device:

- **Factory Reset**. Fig. 4.3.1 shows how to restore the initial configuration or RESET. The beginning of the Factory Default activity is identified by the red LED lighting up for about 10s. In Fig.4.4.1 the support area of the device is shown where the LEDs are highlighted and when they light up they indicate to the user that the reset has occurred.

By resetting, the counters showing the consumption of the lamp and the filter will be clearly reset with the consequent loss of such information.

- **Initialization OK**.Once the machine restarts, to signal the reset, three LEDs flash simultaneously six times in a row;
- **No Wi-Fi**. When the device is connected to the network and fails to connect to the expected signal (SSID), the LEDs perform independent switching on and off from right to left. This type of protocol indicates that the device is not connected to the network;
- **MQTT DISCONNECTED.** disconnected or when, remotely / over the network the device fails to connect to the MQTT server (master device). In this case the blue led flashes 10 times in a row. N.B. After the Wi-Fi Absent and MQTT Disconnected

signaling, the system restarts to attempt a new connection, therefore the Initialization OK signal reappears;

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To check if the device is connected in ACCESS POINT mode, the LEDs in fig. 4.4.1 will be colored red.
Correct connection in MQTT mode is visible with the LEDs indicated in fig. 4.4.1 green in color.

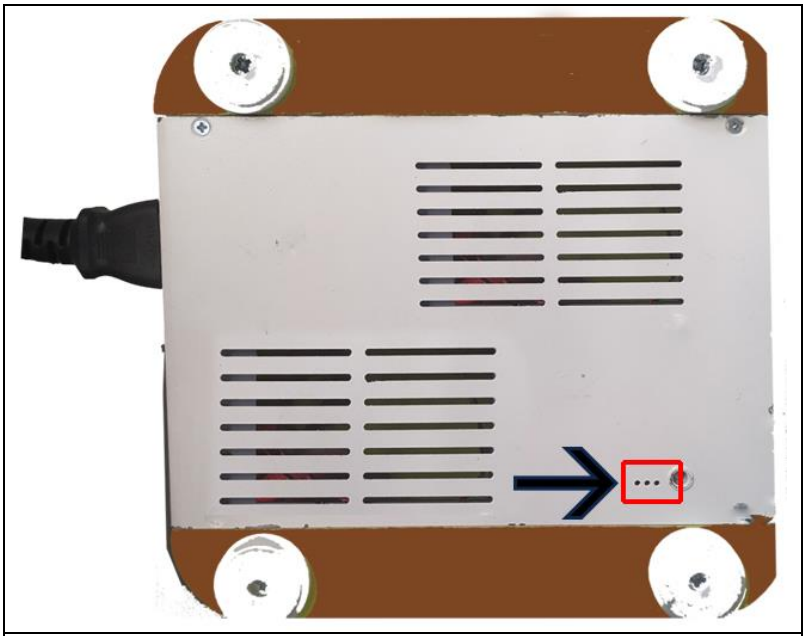

Fig.4.4.1 – Reset signal lights

3.5 Scope of use of the machine

As previously described, the machine is used in an optimal way for sanitizing the air in small and medium-sized indoor environments. It can be used in healthcare facilities, Emergency Rooms, offices, homes, warehouses, hotels, restaurants, bars, ... and also inside motor vehicles / trucks. The technical file shows the tests that are carried out during the production phase of the machine and those relating to quality control, before the device is stored in the sales warehouse and therefore ready for marketing.

The machine was designed to perform air sanitization functions, eliminating the possible risk situations analyzed. Uninterrupted use and for long periods, without properly cleaning the filter elements, could lead to unexpected overheating, resulting from the formation of layers of dust.

3.6 Technical Specifications

The following table summarizes the technical characteristics of the devices. As can be seen from the card, the serial number is sequential and common to all the machine models belonging to the family of Air-Bee products. The manufacturer, for internal traceability of the products, maintains a register containing information relating to each device delivered, including the name of the operator who performed the tests on the machine relating to the specific production batch. In this way it is possible, at any time, to determine the life cycle of the product from its creation to delivery to the end user. The HOME technical sheet follows

Typology	**RA**
Model	**HOME**
Serial number	……..
Device mass (Kg)	10 Kg
Frame length	170 mm
Frame width	170 mm
Frame height	350 mm
Metal casing	Steel with epoxy paint
Wooden base	Oak
Fan model Omega Fuses	120 x 25 mm
Avarage fan speed	3.750 RPM
Ballast Philips	HF-M RED 109 SH TL/PL-S 230-240V
UV lamp FC UNIT 3"	#1 – Brand DUST FREE

Catalyst alloy coated with TiO_2	Dust Free	
Absolute filter	Tecnocomp Filtri	
Antibacterial filter Soliani EMC	TiO_2	
Tipology plug for connection to the mains	Italiana three pin plug	
Mains voltage IN	220VAC	50Hz
Transformer (VCE10US12)	OUT 10W, 12V, 830 mA	
Length of the power cable	≥1,5m	
Component for WiFi connection (model: ESP32-WROOM-32D)	Module WiFi (802.11) SMD Module, ESP32-D0WD, 128Mbits SPI flash, UART mode, PCB antenna	

3.7 External application operation

The AIR-BEE devices (Home, Wall, ... etc.), created to perform the innovative function of natural sanitization through the photocatalysis process, can optionally be equipped with a centralized software system. Its peculiar function is, thanks to specific probes / sensors, to "smell" the air and perceive, in addition to temperature and humidity, also: Particulate matter (PM 2.5 and PM 10); VOC. As for the devices to which it is connected, the color variation indicates the different concentration of the information received by the sensors. The presence of a Wi-Fi card on the machine allows you to create a wireless network with the other devices in the environment in which they were installed. The specific functions of the device as well as its configuration and connection methods will be described in the next paragraphs.

3.7.1 SYSTEM INSTALLATION AND ACCESS

The first step in configuring and using the device is to download it to your smartphone from the Android or IOS store. The app is compatible with all the latest generation routers, so

there are no problems using it within your home network. Fig. 4.7.1.1 shows the initial page where you can LOGIN and enter your credentials, username and password.

If the user is at his first access, it is necessary to proceed with the registration (Fig. 4.7.1.2) where little information will be entered including the password which, for security reasons, must have a minimum length of 8 characters. Once the procedure is completed, a request for confirmation of registration will be sent to the email entered in the registration process. If the user has forgotten the password, the system allows you to retrieve it to proceed with the use of the device management system.

It is not necessary to register the app as the devices can also be managed without the aid of the software component

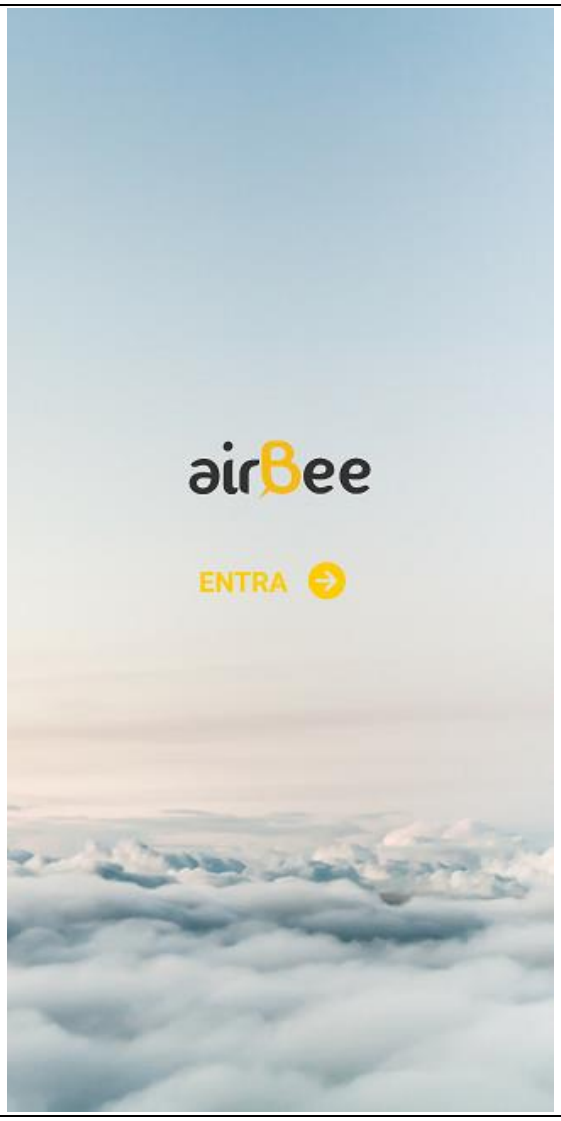

Fig.4.7.1.1 – Login

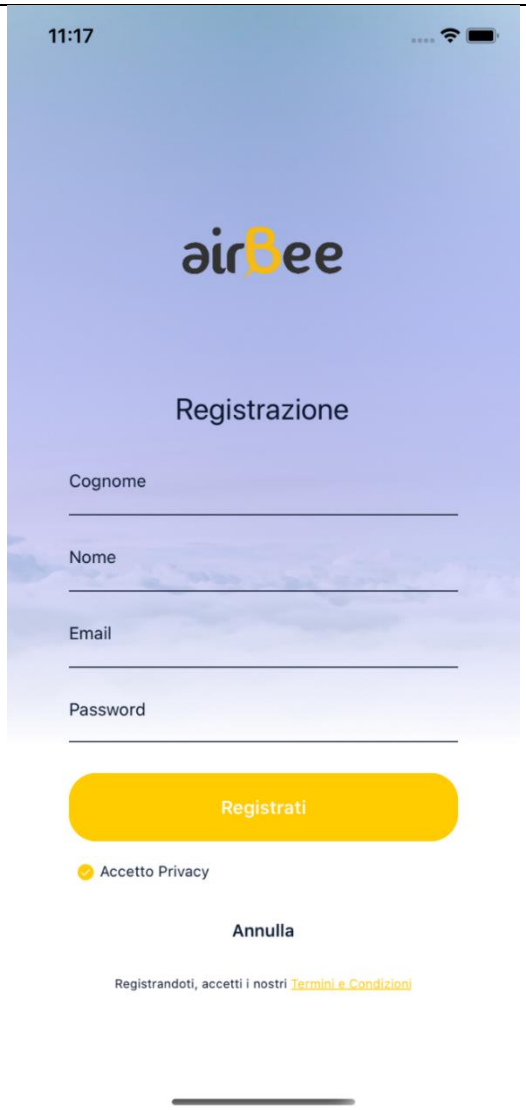

Fig.4.7.1.2 - Registration

Fig. 4.7.1.3 shows the interface that is used for adding devices to the network, created through the device used that performs the task of access point for other devices and connection to a remote server, using the MQTT protocol. Reading from left to right, the functions are: 1) Adding a new device; 2) Retrieves and displays weather information based on the user's location; 3) Update the list of connected devices.

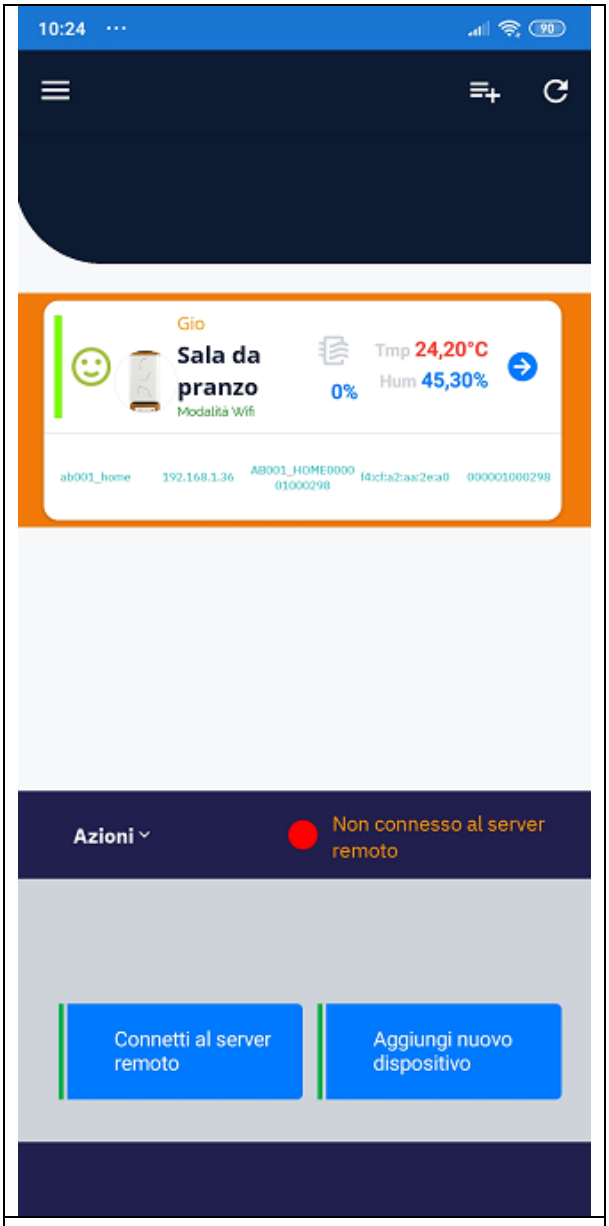

Fig.4.7.1.3 – Information

GPS must be activated in order to receive Weather information as well as to record the location of the device during registration.

Fig.4.7.1.4 – Reading of values obtained from internal sensors

In Fig. 4.7.1.4 you can see how easily it is possible to read the features managed by the APP. Details of the points indicated in the figure are provided below:

1. The bar graphically indicates the air quality detected by the device probes. The color (green in Fig.4.7.1.4) can vary between the following colors: red, yellow, green;
2. The emoticon indicates the air quality detected based on the expression;
3. Point 3 describes how to connect the device to the network. The case shown in Fig. 4.7.1.4 The device is connected in WiFi mode (2.4Ghz);
4. Instantaneous temperature detected;
5. Instant humidity detected;
6. Physical data of the device: product code, IP address, serial number, mac address SSID,….

3.7.2 New device registration

The image shown in Fig. 4.7.2.1 shows the information to be entered for the registration of a new device belonging to the AIR-BEE network of air sanitizers. Fig. 4.7.2.5 shows the interface with which the user can connect to the MQTT server and / or add a new device. In this phase, the user must provide for the insertion of the following information:

- The serial number on the device label;
- The nickname of the device, or the name that the user intends to associate with the device (eg. PIPPO);
- IP address for device registration. Necessary the first time when communicating in local WI-FI mode with the device;
- Option that indicates whether the device is already configured on the home WI-FI network (connected to the line provided by the ISP) and then connected to the MQTT server;
- Type of device.

.

To register, the smartphone must be connected to the Wi-Fi associated with the connection (SSID) of the AIRBEE device.

In order to physically connect the device, proceed as follows:

- Using home connection, connect to the application / APP;

- After logging into the APP, disconnect from the home network (Wi-Fi connection) and connect to the device's network (Access Point). Normally the default SSID starts with HOME and the network password 123456789;
- At this point it is possible to perform the steps for registering the device, as indicated in the previous points;
- At this point it is possible to view the data that are read from the device (Fig.4.7.2.2);

Once the device has been inserted into the network, it is possible, as described above, to check its status and the information read in real time. An example of this information is shown in Fig. 4.7.2.2, reading from top to bottom:

Air quality indicator

Temperature and humidity detected

Operation Lamp hours

Percentage of filter wear. To be changed every 1000h (One thousand hours);

Device control buttons. They vary by device. In the HOME version there will be speed, auto, sleep and shutdown control buttons;

Remote device status: detected only for the home device;

Indicators of gas and particle parameters detected.

The layout of a Home device is shown in Fig. 4.7.2.2, and the information read by the sensors, present within the network, is shown in Fig. 4.7.2.3.

-

Fig.4.7.2.1 – New device registration

Once the device has been inserted into the network, it is possible, as described above, to check its status and the information read in real time. An example of this information is shown in Fig. 4.7.2.2, reading from top to bottom:

- Air quality indicator

- Temperature and humidity detected
- Operation Lamp hours
- Percentage of filter wear. To be changed every 1000h (One thousand hours);
- Device control buttons. They vary by device. In the HOME version there will be speed, auto, sleep and shutdown control buttons;
- Remote device status: detected only for the home device;
- Indicators of gas and particle parameters detected.

The layout of a Home device is shown in Fig. 4.7.2.2, and the information read by the sensors, present within the network, is shown in Fig. 4.7.2.3.

Fig.4.7.2.2– Home data

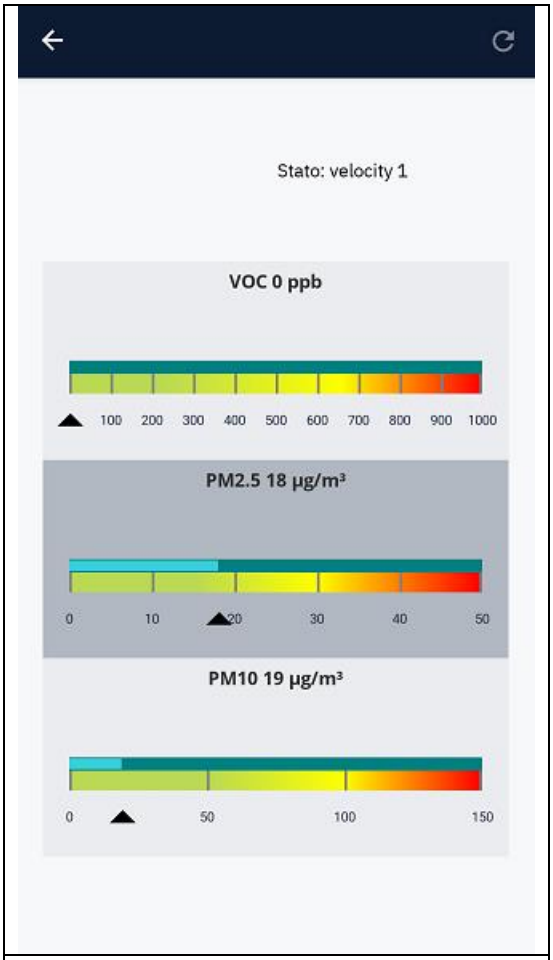

Fig.4.7.2.3 – Sensor reading

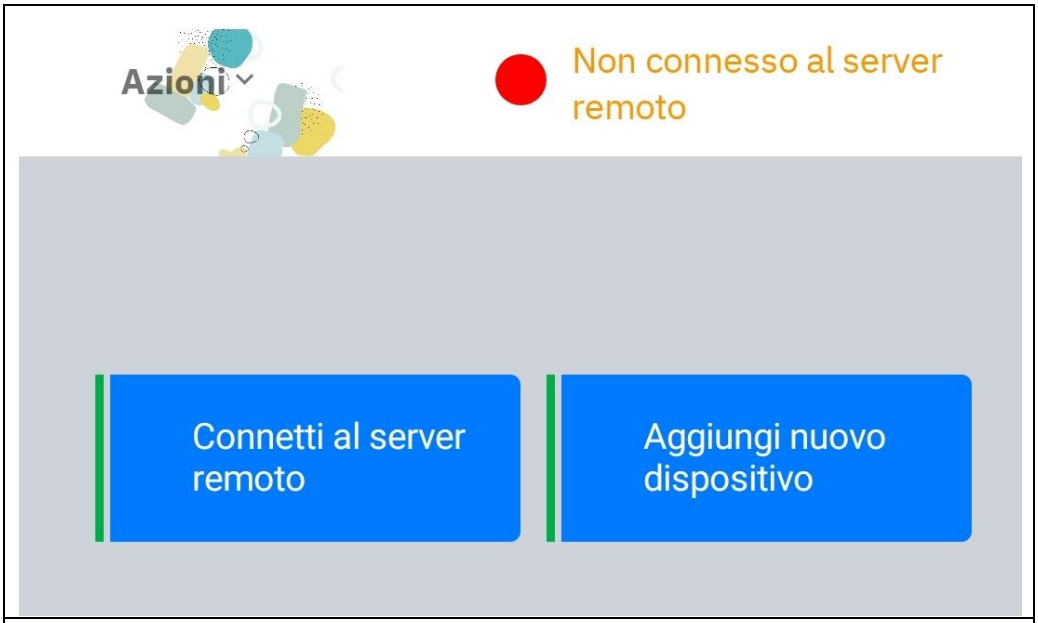

Fig.4.7.2.4 – Description of the MQTT connection

4 Drawings, diagrams, descriptions and explanations necessary for the use, maintenance and repair of the machine and to verify its correct functioning

The next paragraphs will provide information on the device necessary for the use, maintenance and repair of the AirBee sanitizer.

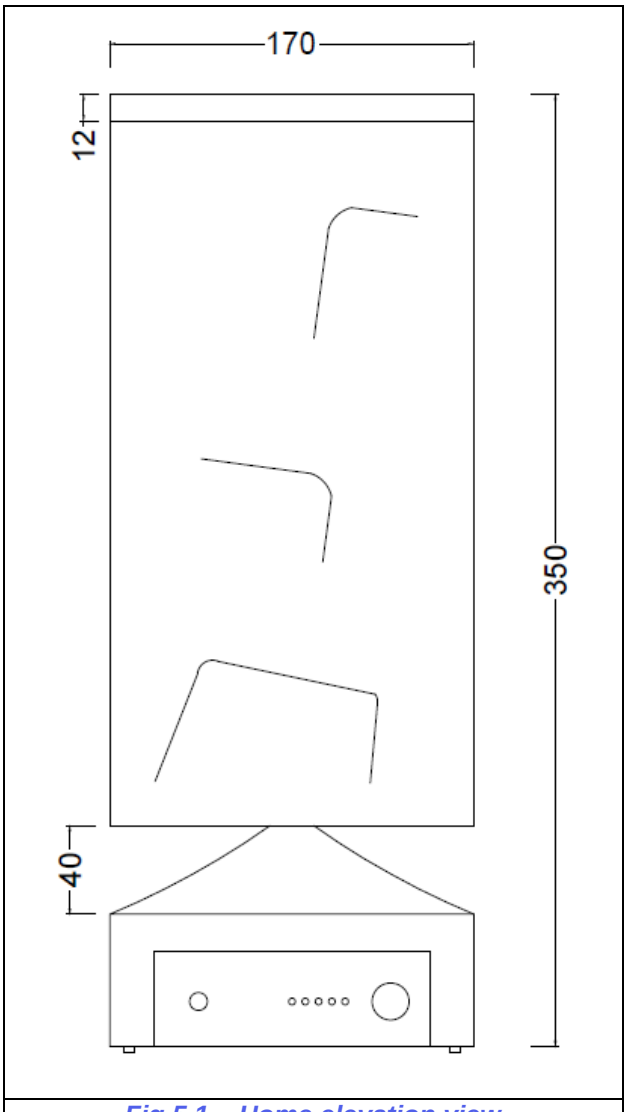

Fig.5.1 – Home elevation view

Fig.5.1 shows the elevation view of the device showing the dimensions of the device components. The lines on the frame are the air intakes from which the sanitized air comes

out. The main components of the device can be seen in Fig.1.5.2. In the figure below Fig.5.2, the image of the board is shown, connected to the external power supply

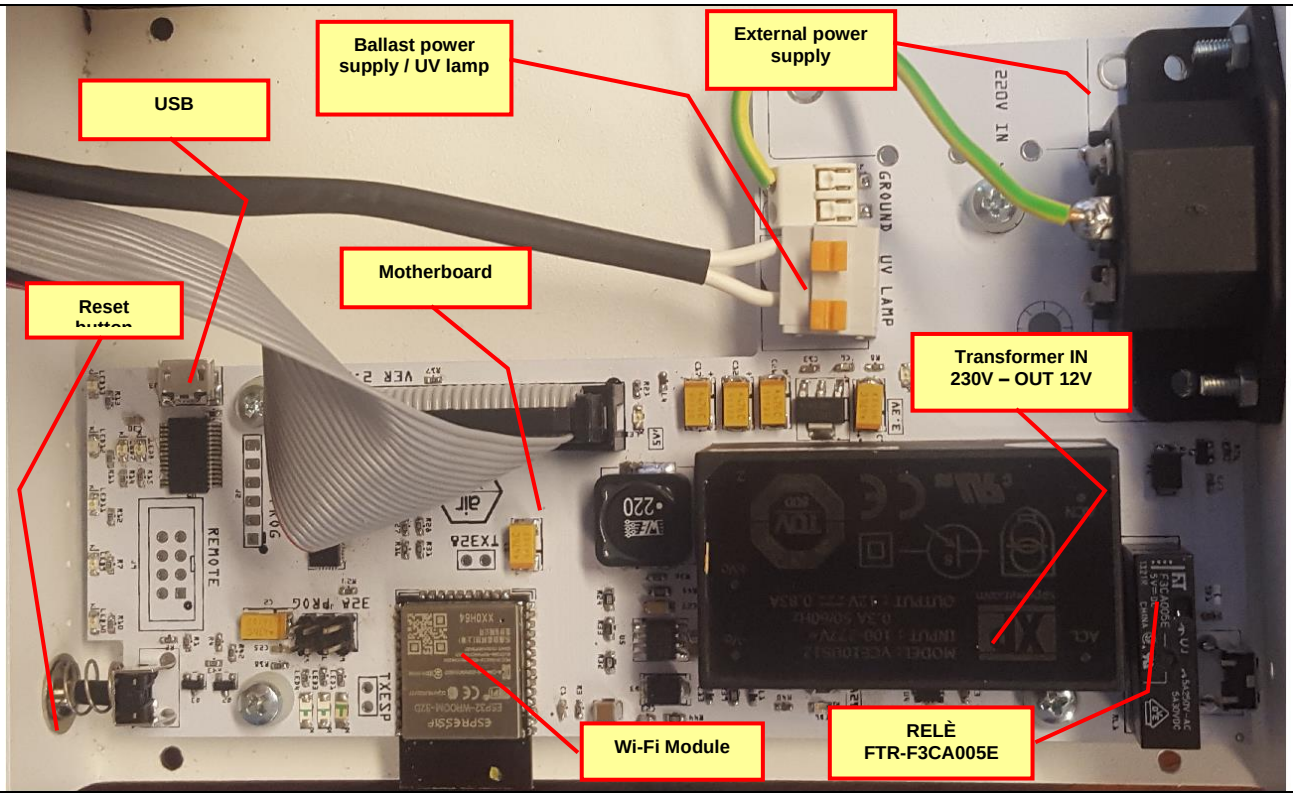

Fig.5.2 – Home power supply and motherboard

Fig.5.3 shows the diagram of the direction of the incoming air flow. As can be seen from this drawing, the air is introduced into the sanitation chamber through the suction of the fan presented in Fig.1.5.1. The air to be sanitized is introduced into the device through suction from below, as shown in Fig.5.3. During this path, the air first passes through the filter, covered with titanium dioxide (TiO2), shown in Fig.2.2, which in contact with the UV light produced by the lamp, placed inside the device, produces a natural reaction , called photocatalysis, which, as previously indicated, sanitizes the air. Subsequently, the air, during its path inside the device, passes through the high performance device (H13), as shown in Fig. 4.1, for the abatement of fine dust and for a greater air sanitizing system . Finally, the air, already sanitized and filtered, is further purified thanks to the photocatalysis process,

found in the upper part of Fig.5.3 obtained by the passage of air from the large mesh filter, hit by UV light. Most of the sanitized air is extracted from the upper part of the device, as shown in the following drawing, but the slits, placed on the side of the frame, allow a first exit of filtered and sanitized air, as shown in Fig. 5.2.1 .

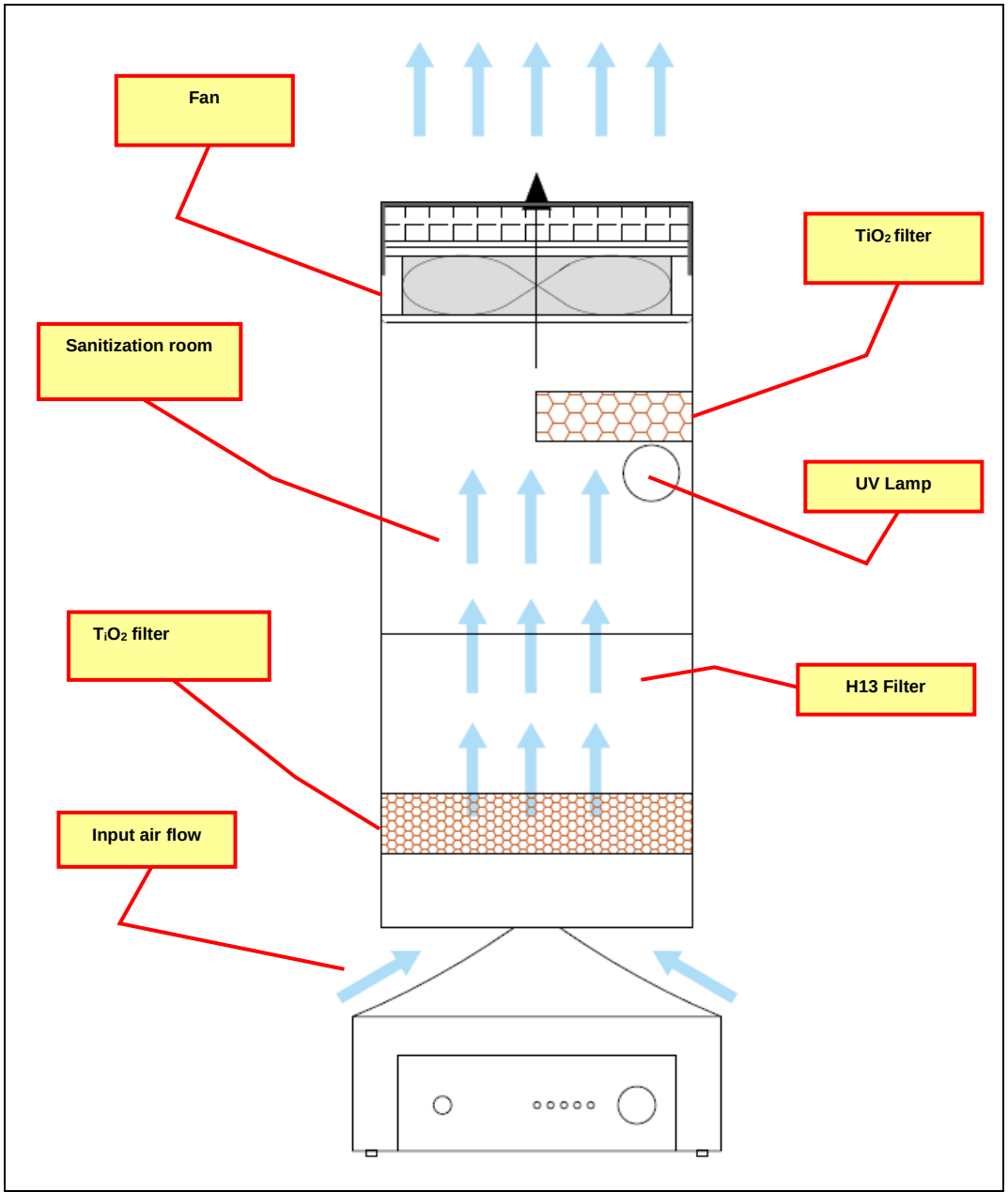

Fig.5.3 – Air flow into the device

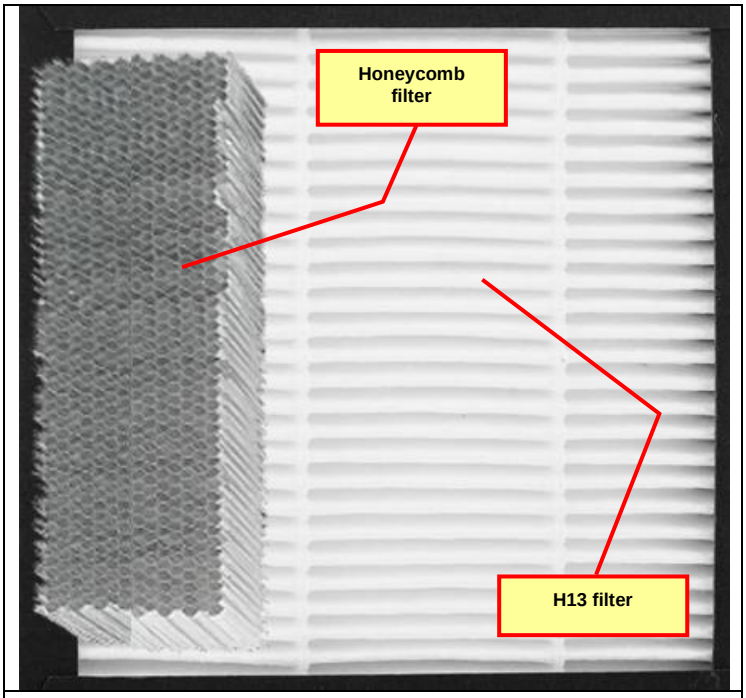

Fig.5.4 – Initial filtration

Fig.5.5 shows the base where the ballast is present, for powering the UV lamp, and the transformer. On the perimeter of the base there are LEDs to provide lighting for visual signaling of HOME operation.

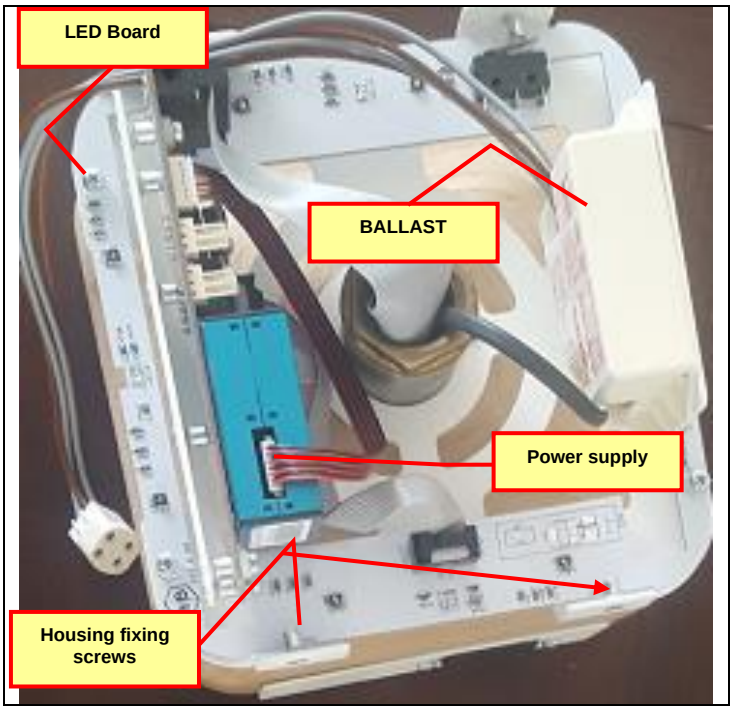

Fig.5.5 – Base of the device

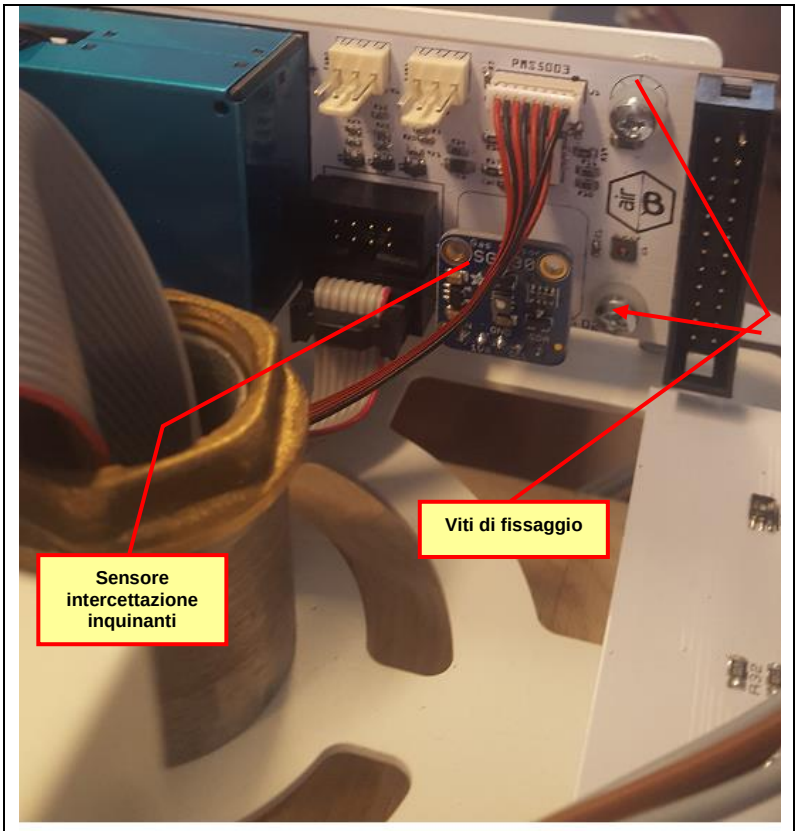

Fig.5.6 – Sensor for detecting pollutants

Fig.5.7 shows the elevation of the base from which it is possible to see the indicator lights for activating the device functions.

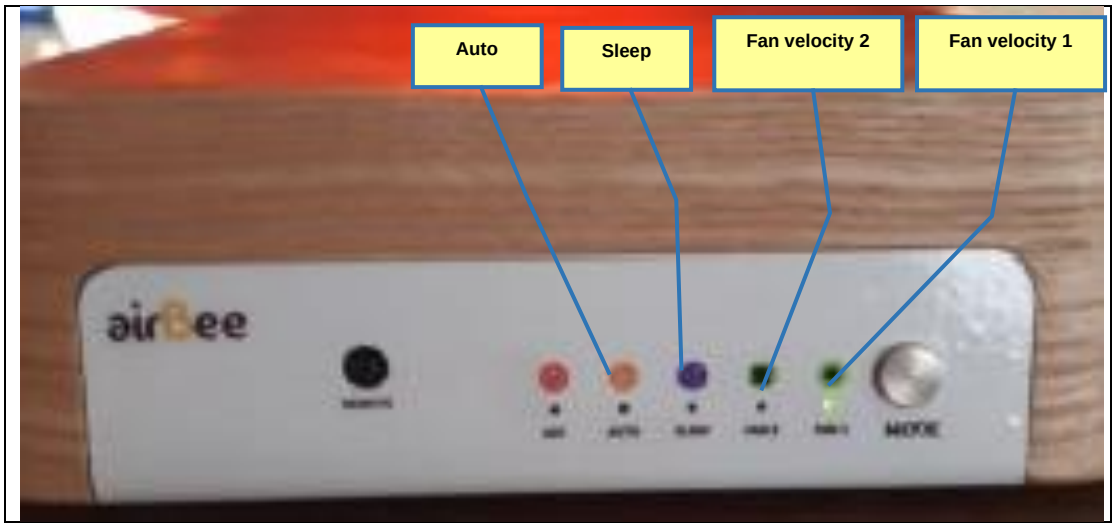

Fig.5.7 – Elevation view of the device base

In Fig.5.5 and Fig.5.6 safety systems are shown to prevent vibrations, ineffective tightening, ... from compromising the structure of the device, i.e. the fall of screws on the plane and consequent dangers of stability or, worse still, potential electric arcs.

In the case of industrial environments at risk of explosion (eg milling companies, deposits of gunpowder, ...) it is necessary to contact the manufacturer before proceeding with the installation / activation of the device.

4.1 Identification of main components

The main components of the sanitizing device are:

1. Transformer (VCE10US12) 230VAC in input and 12V in output (10W and 830mA);
2. Philips ballast for UV lamp power supply (Fig.5.1.3);
3. PELKO fan for introducing air into the sanitizing circuit;
4. Photocatalyst. Consisting of a honeycomb filter coated with titanium dioxide (TiO2) which, exposed to ultraviolet light, generates the extremely efficient and effective photocatalysis reaction for air sanitization;
5. High performance H13 filter for the filtration of fine dust;
6. Filter (Fig.2.2) covered with catalysing material (TiO2) to optimize the sanitization process with a second photocatalysis
7. UV lamp;

Warning: danger of electrocution. Never open the device case wihen the power plug is inserted. pericolo di folgorazione.

The following slide shows the wiring diagram of the components responsible for the operation of the HOME.

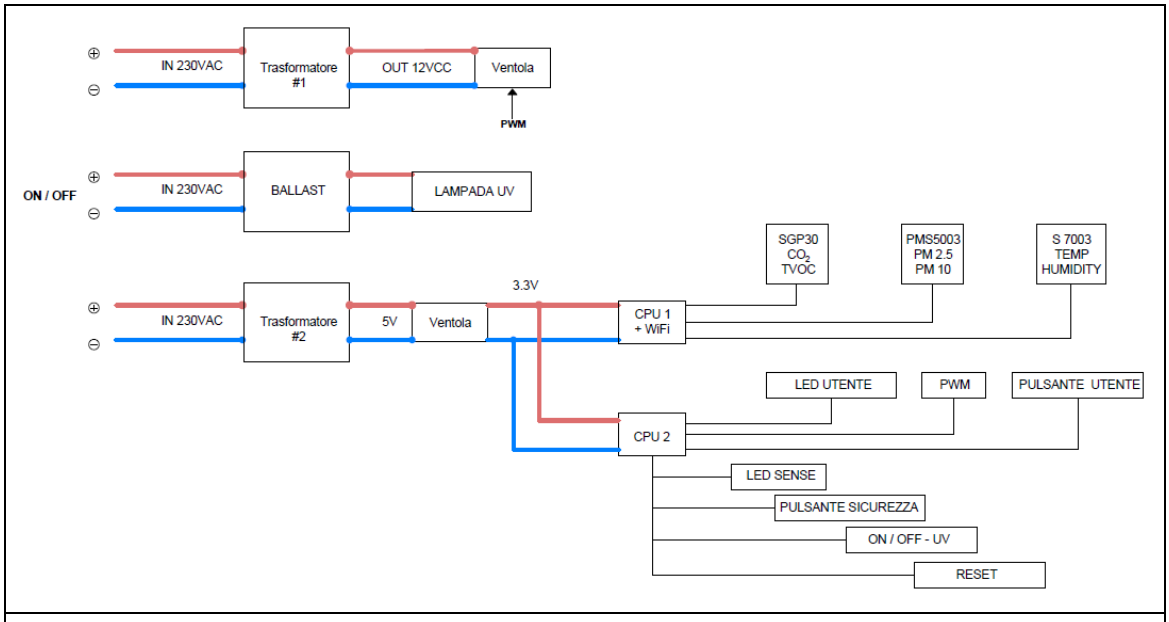

Fig.5.1.2 – Home wiring diagram

The following image (Fig.5.1.3) shows the ballast, namely the power supply of the UV lamp (s) inside the device.

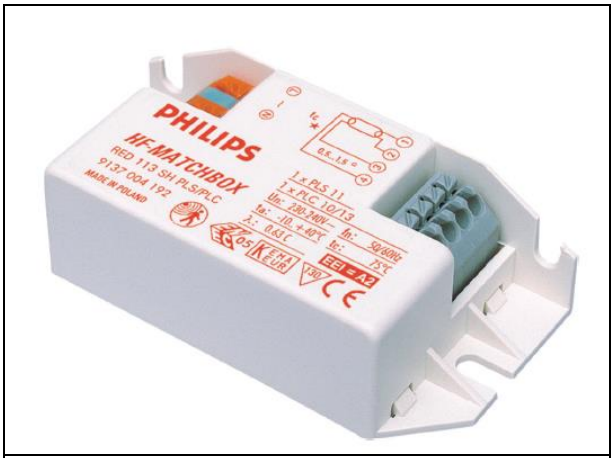

Fig.5.1.3 – Ballast

4.1.1 Control system

The device is activated by connecting it to the mains power system (230V). After having activated the On-Off button (Fig.5.7) from the central panel, a play of lights can be observed through the internal visual communication LEDs, present on the board in Fig.5.1.1.1. The

visual communication ones make a gradual transition from green to red and vice versa, while the LEDs on the front panel turn on and off progressively, until the final completion of the ignition. The modest dimensions of the device mean that the product can be easily transportable and / or movable or inside small, medium and large rooms (for the latter case it is necessary to provide a network of devices for adequate coverage of the rooms). Fig. 5.1.1.1 shows the card where the LEDs pertaining to the control system are positioned, identifiable in Fig.5.5.

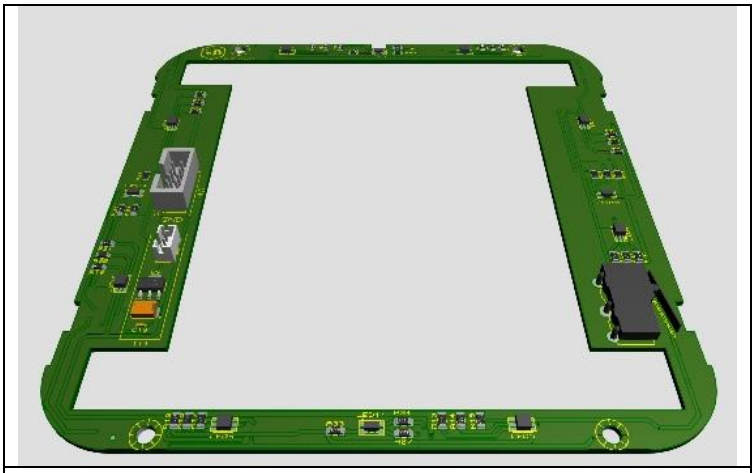

Fig.5.1.1.1 – LED board

4.2 Recognition of left and right side of the machine:

To identify the right and left side of the device, the front elevation will be taken as a reference point, shown in Fig.5.2.1, i.e. where the power button is located. In this image, in addition to the indication of the right and left side, the front openings (also present laterally and rearward) are shown for the passage of air, aspirated from the bottom up, filtered and sanitized with a photocatalysis process by the UV lamp placed in the upper part of the sanitation chamber.

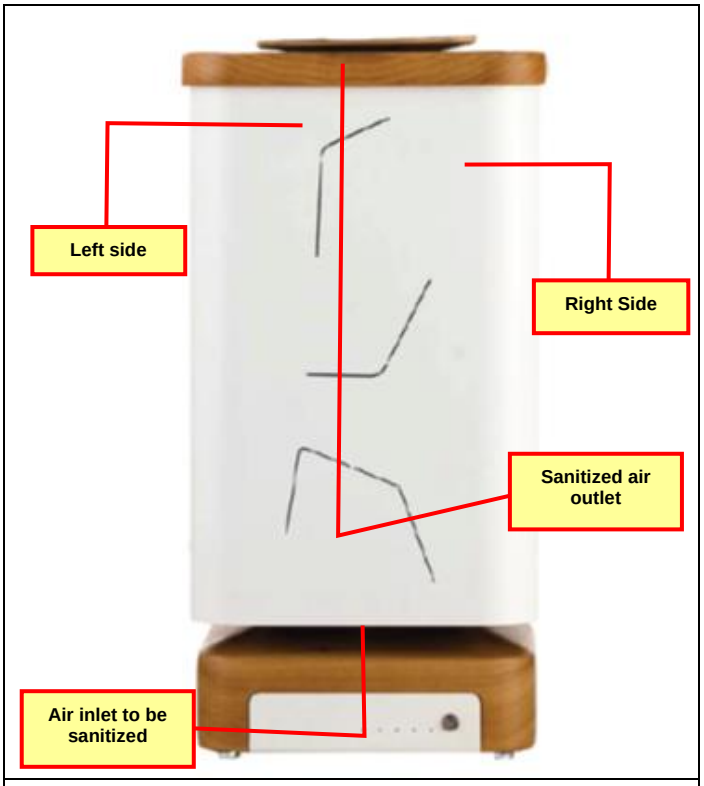

Fig.5.2.1 – Front elevation

It follows that the front is the one where the power button is shown, while the rear is where the mains power input connector (230V) is located.

4.3 Instructions for assembly and disassembly

The device is very simple to assemble and disassemble, given its not excessive size and mass (10 Kg). Below are the instructions and specific requirements relating to assembly activities:

1. Before positioning it definitively, it is necessary to fix it firmly on a flat surface to prevent any vibrations from compromising its stability. N.B. Make sure the device is not unbalanced and that all 4 feet are firmly seated;
2. Check that inside the frame there is no presence of: rust, sand, water / humidity ... which may have deposited during transport or when using the machine in very humid environments;

3. Make sure that the machine is in a perfect horizontal position with respect to the surface (horizontal or vertical) on which it is fixed;
4. Before starting the machine, check that the frame has been securely closed to avoid potential risk of electrocution. Before fixing, make sure the screws are tightened correctly;
5. Before starting the machine, check that the network system to which it is connected is equipped with a life-saving device (differential magnetothermic with adequate sensitivity eg. 30 mA);
6. Once connected to the network and activated the power button, make sure that the machine performs all the ignition functions, described in the previous paragraph;

Make sure in advance that the voltage requirements (see technical data sheet) for powering the device comply with that used for steady-state operation.

Make sure in advance that the voltage requirements (see technical data sheet) for powering the device comply with that used for steady state operations.

Carefully examine the labels applied on the packaging relating to the delivery of the machine, important information may be reported for safety purposes.

Do not modify the connection plug to the network system for any reason or splice / modify the cable with others of different sizes and / or types.

<u>Disassembly</u>:

For disassembly, the operations to be carried out are the same as for assembly, but clearly in reverse.. First of all, disconnecting from the central electrical network and after waiting a few seconds, start with the disassembly operations.

If the device is stored in the warehouse, make sure to pack it correctly, in order to prevent oxidation of the metal parts.

4.4 Adjustments

4.4.1 Adjustments horizontally

Once the device has been fixed, it is good practice to carry out periodic checks on its stability, checking that it is always perfectly level on the horizontal plane. The frequency of these checks depends on the level of stress to which the machine is subjected or on the effects that possible vibrations may have on the tightening of the screws and therefore on the stability of the frame. In any case, it is good practice, for safety reasons, to carry out periodic checks in relation to the operation, under stress conditions, of the device. It is recommended that these checks be carried out at least every six months.

4.5 Use of the machine

	At this point it is possible to use the machine safely. However, before starting the work cycle, it is necessary to check that it complies with all the protections envisaged.
	All the information contained in this section of the manual must be discolsed to all those who will assemble, use, maintain and dismantle the machine.

	Always wear personal protective equipment before starting work. (Fig.1.3.2)
	Positioning deliberately at a distance of a few centimeters from the sanitized air outlet does not particularly improve the positive effects of the device.

4.6 Requirements for operating and maintenance personnel

The personnel assigned to the use (assembly and disassembly) and maintenance of the device in the event that they are not authorized and recognized by AirBee, must have adequate skills in mechanics, electronics and electrical engineering. These peculiar characteristics, together with the consultation of this instruction manual, make it possible to obtain the maximum possible result from the device in question.

4.7 Checks

Periodically preventive checks must be carried out on the device and its structure. In particular, tests and verifications must be carried out as shown in the following table:

Type of verification	Description
Visual	Verification of the integrity of the machine protections: The frame must not have cracks or oxidation points and no areas of humidity must be found inside the device. the internal component must always be firmly fixed to the frame (eg. power supply,ballast, UV lamp, catalyst, filters…)
Visual	Check the external condition of the machine and, if necessary, clean it, both external and internal. The accumulation of layers of dust on the

	electrical circuits can lead to a potential fire risk.
Visiva	Check for any worn, deformed or rusting parts (art.7 DPR 164/56). The presence of at least one of the three conditions must be immediately resolved through an immediate revision of the device.
Manual	Ve Check the correct tightening of screws, nuts and / or bolts. It is a good practice to carry out this check the first time the device is mounted. The operation may be re-performed at the user's discretion. It is recommended to repeat the check every 4,000 hours of continuous operation (approximately 6 months) at the latest. The manufacturer is not held responsible for any inattention by the user or his negligence in the correct execution of the checks and safety procedures indicated in this manual. Check the presence and status of safety signs. Check for the presence of live parts that are not sufficiently insulated or segregated (UNI EN ISO 60204-1) which could involve risks of electrocution. It is advisable to check the integrity of the electrical connections before putting the machine into operation and to repeat them periodically, at the user's discretion.
Visual	Check the presence and status of safety signs.
Visual	Check for the presence of live parts that are not sufficiently insulated or

	segregated (UNI EN ISO 60204-1) which could involve risks of electrocution. It is advisable to check the integrity of the electrical connections before putting the machine into operation and to repeat them periodically, at the user's discretion
Instrumental	Verify that the climatic / environmental conditions where the machine is intended to operate comply with current legislation, in accordance with the provisions of UNI EN ISO 60204-1.

4.8 Warnings for safe use

	For the use and maintenance of the machine, always follow the instructions given in this manual.
	Do not remove parts of the machine or make modifications not foreseen by the manufacturer. In case of breakage and / or damage to the protections, replace them immediately, using original spare parts or authorized components and not with handcrafted devices.
	In the event of use of the device in a company environment, any failure or damage must always be reported to your employer in order to immediately repair it.
	Keep the safety signs on the machine intact and replace it in case of deterioration.
	In the event of a fuse or other electrical and / or electronic components breaking, do not attempt to repair the product, contact the manufacturer and / or the technical assistance of AirBee or one of its partner centers.
	In the event that the external device is somehow contaminated / soiled, it is recommended to clean it carefully with a damp cloth, taking care to remove the mains power supply.
	In case of operation of the devices in a star network, always check the correct connection,which means that all the devices are to be connected to the local

	network.

Quelli che sono descritti di seguito rappresentano i pittogrammi e/o la segnaletica di pericolo che deve essere predisposta in prossimità o a bordo della macchina.

	WARNING. Risk of electrocution
	WARNING. Read the manual of use and maintenance

5 Periodic maintenance and checks

According to the provisions of Art. 71, paragraph 4, point 2 and paragraph 8, point 2 of Legislative Decree 81/08 maintenance interventions must be carried out at regular intervals. From the norm it is clear that maintenance activities are an essential condition for the optimal maintenance of the machine. Another positive implication of maintenance planning is greater safety in accident prevention..

Ordinary and extraordinary maintenance interventions must be carried out in an appropriate workplace, which has the following requirements:

- Flat and adequately sized workbench;
- Well lit;
- Equipped with good quality equipment.

The competence of operators with experience and expertise in the electrical and electronic field must be clearly added to the previous points. The ordinary maintenance criteria are indicated below. We remind you that, for maintenance activities, you must always wear the necessary PPE such as gloves, safety shoes, protective goggles and suitable clothing.

N.B. Although we are dealing with a modest-sized machine with few but effective electronic components, we still recommend the use of expert workers for maintenance activities. Clearly, this advice can be ignored if the user is familiar with its assembly and disassembly operations, work on electrical components and cleaning. The manufacturer will not be liable in the event that the user carries out maintenance activities without ensuring and knowing

the most trivial safety measures, such as disconnecting the device from the network during maintenance activities.

5.1 Cleaning

The machine must be periodically cleaned to clean it of any residual dust and / or dirt that may have deposited during the operation of the machine. It is essential to clean the internal parts, such as the filters, and the fans, while a damp cloth can be used for the frame, taking care to prevent detergent solutions and / or water from penetrating the electrical / electronic components.

Before cleaning the filters and / or the fan make sure you understand the correct way to perform this task.

The filter, coated with titanium dioxide (TiO2), cannot be washed in a washing machine or dishwasher. It is recommended to use running water and to dry it properly before reinserting it in its housing.

To avoid potential risk of electrocution, during maintenance operations disconnect the connection from the mains power supply.

5.1.1 Filters cleaning

Routine maintenance of the machine involves cleaning the filters and the fan in order to remove any dust deposits that may have settled during the machine's operating cycle. Filters play an important role within the air sanitization cycle. In fact, given the tight meshes, they prevent the passage of suspended particulate matter which, otherwise, would be breathed by the user. For this reason, with a frequency of at least 3 months (at most and with a low use thereof, terms of hours of operation, or depending on the minimum or massive presence of suspended dust).

To perform this activity it is necessary to extract the filters, as shown in Fig.1.5.2, proceeding delicately in order not to damage the frame or the guide of the filter itself. To remove the external casing, and therefore to access the filters, it is necessary to remove the fixing screws which can be removed even with hands.

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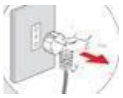

.Before carrying out this operation, it is recommended to switch off the device or, for greater safety, remove the plug from the mains power socket.

After removing the front protections and extracting the filter, proceed as described below:

It is recommended to keep the case locking screws in a container in order to be able to reassemble them at the end of the cleaning activity.

To clean the filters, proceed according to the same operating procedures and the same attention used for common air conditioners, namely: extraction of the filter and cleaning by immersion in running water.

Once the filter has been removed from its housing, use a jet of hot water to remove further residues and dry with a cloth. We do not recommend the use of aggressive detergents that may possibly damage the internal parts of the machine. The filter coated with titanium dioxide is washable, but not in the washing machine or dishwasher. Remember to dry it thoroughly before reinserting it into its housing.

After dealing with the washing phase, with a damp cloth or with a compressed air sprayer, proceed to dry the filter.

After the cleaning phase, the filters must be placed in their housing gently and fixed to prevent vibrations or annoying noises during the operation of the machine. The HEPA H13 filter can be positioned in any direction, both to the top and the bottom.

Cleaning the fan

The AirBee's air sanitizer fan is the only mobile component capable of producing vibrations, directly proportional to the rotation speed of the blades. In this regard, it is important that it is periodically cleaned thoroughly, by carrying out the following procedure:

5.1.2 Fan cleaning

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The AirBee's air sanitizer fan is the only mobile component capable of producing vibrations, directly proportional to the rotation speed of the blades. In this regard, it is important that it is periodically cleaned thoroughly, by carrying out the following procedure:

- Make sure that the machine is disconnected from the mains, by unplugging it from the socket and in case of doubt disconnect the connection from the electrical pannel;
- Remove the machine guard in order to reach the area where the fan is positioned;
- With a damp cloth, carefully clean the impeller;

The frequency with which to clean the fan depends on the amount of dust that has deposited inside it, therefore, except for special conditions, the frequency is at the user's discretion. The checks must be carried out at least once every 3 months. We recommend extreme caution during this maintenance operation or, if you do not feel confident, contact an electrician. According to what is indicated in the supplier's technical data sheet, the UV lamps that are used within the devices in question must be replaced at least every 23 months.

5.2 Electrical system maintenance

For the maintenance of the electrical system (Fig.5.1.2) it is absolutely necessary that you have sufficient skills and technical knowledge or, if not, contact the manufacturer. An incorrect intervention could compromise the integrity, operation, and safety of the machine.

Before carrying out any control and / or maintenance activities on the electrical system, it is absolutely necessary to disconnect it from the main electrical panel.

During routine maintenance activities it is advisable to check and make sure of the solidity of the connections (electricity transport lines) and thus prevent any loss of energy and consequent increase in temperature (Joule effect). *The electrical system designed and built for the device complies with the IEC 60204-1 standard.*

Do not replace cables or worse still create by-passes without the written authorization from the manufacturer. For such initiatives the manufacturer declines all responsibility for any damage.

The sanitizing device has not been designed and built to work in areas with a specific risk of explosion.

5.3 Screw tightness check

When using the machine for the first time, it is recommended to check the correct tightening of the screws and repeat this procedure at the user's discretion. It is advisable to carry out

this inspection periodically and at the latest after approximately 4,000 hours of continuous operation (approximately 6 months). *The use of a torque wrench is not required for tightening check.*

It is recommended to tighten gently in order to avoid damaging the threaded metal elements or stripping nuts or screws.

Any damage deriving from discrepancies with the machine, with respect to the initial configuration and / or construction parameters, relieves the manufacturer of any responsibility.

5.4 Component replacement

It is recommended that the replacement of parts of the machine be carried out by the manufacturer's personnel and / or by authorized workshops with specific experience and knowledge of the machine.

The use of components not supplied by AirBee voids the warranty of the machine, and / or any liability attributable of the manufacturer.

Before carrying out any replacement, the machine must be placed in STOP condition and the power supply must be completely disconnected from the mains.

Any removed and / or replaced component must not be left inside the frame for any reason, it must be removed and disposed of in accordance with current legislation.

The use of original components is recommended to prevent compatible products (not 100%) from compromising the functionality and integrity of the machine.

The following are the components that can be ordered from the manufacturer to be replaced if necessary:

- Filters;
- UV lamp;
- Fan;
- Cables;

Other parts / components can only be replaced by qualified technicians.

The replacement of switches, in the event that it is performed by the user, must be carried out in accordance with the requirements of the EN ISO 61058 - 1: 2019 standard.

CAUTION. Exposure to UV rays is dangerous for the eyes and skin. It is recommended to NEVER use the lamp outside the safe place in the device or without the foreseen protections.

In order to avoid blocking due to oxidation, it is advisable to periodically lubricate the threads of the screws with grease and tighten gently.

6 Example photos of the safety devices

During the design and construction phase, all the potential risk conditions associated with the use of the machine were resolved. The external case or frame, without edges and rough parts, represents the main guard of the air sanitizer and has been designed to be placed on a horizontal plane.

The internal cables are protected (Fig.7.1) to prevent vibrations from wearing the plastic sheath and shorting the cable, therefore it is absolutely forbidden to remove these protections.

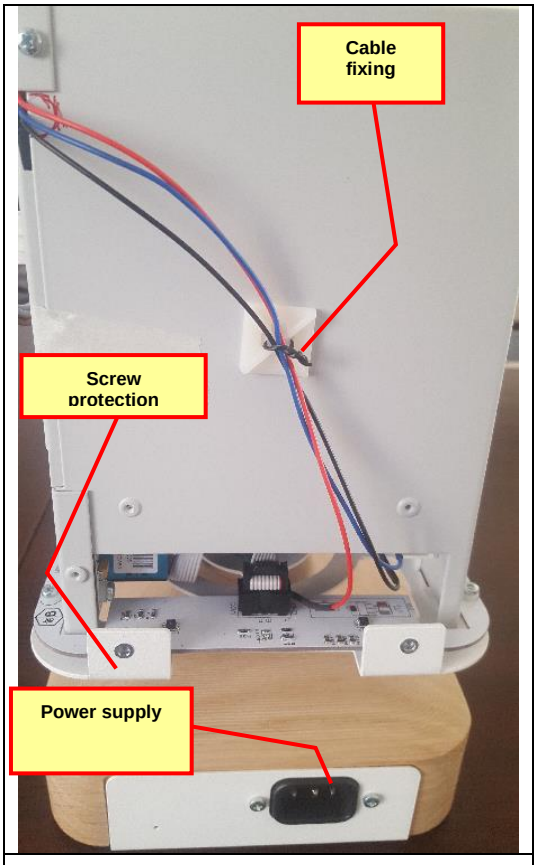

Fig.7.1 – Protections

In case of maintenance, before removing the protections, it is necessary to check that the device has been disconnected from the mains power supply
N.B. Always wait a few seconds before starting maintenance so that any capacitors are completely discharged.

The risks that have been analyzed and removed during the design and production phase are as follows:

1. **Elettrical:** for protection from direct or indirect contacts
2. **Mechanical:** or to protect against any sharp or moving parts;
3. **Thermal**: Protection from possible high temperatures;
4. **Fire**: Arising from high temperatures due to faults in the product;

As regards the point relating to electrical hazards, although the outer covering was made of steel, the risk of electrocution is reduced as the cables are equipped with adequate insulation and fixed to prevent friction from reducing the layer of sheath protection. Due to mechanical risks, in all AirBee devices, there are no sharp parts and the only moving parts are the fans, which in any case are protected.

For the prevention of thermal and / or fire risks, during the design phase, the manufacturer followed the provisions of the **CEI EN 60204-1:2018** standard. The safety devices that have

been designed provide a valid prevention tool but an inappropriate use could pose serious risks to the health of the users.

7 Description of the workplaces

Although there are no "traditional" workplaces, maintenance for this type of machine can only be entrusted to personnel with adequate training and experience, or to operators who have read this use and maintenance manual and have read all potential and residual risks of the machine.

Frequent cleaning of the machine filter elements is recommendedi

7.1 Operational phases

The following are the main actions for safety in the use of the machine during its main operating phases:

Before using the machine:

- Read and consult the manuals supplied for the use and maintenance of the machine; Prendere visione e consultare i manuali forniti in dotazione per l'uso e la manutenzione della macchina;
- Check the presence and correct positioning of the guards and the operation of the safety devices;
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-
- General visual check of the whole machine (evident deformations or breakages of the structure, protections, etc.), check of the conditions of the power supply cable, cable glands, etc .;
- There is no emergency stop button (in accordance with point 10.7 of **IEC 60204-1:2018**) as in case of emergency the grounding device intervenes or interrupts the power supply by disconnecting the cable from the socket;
- Start-up and function test (creaks, unstable parts, abnormal noises, unexpected vibrations, etc…;
- **While using the machine:**
- Keep the guards and safety devices correctly positioned;
- Check for any malfunctions or failures;

After using the machine:

- Turn off the machine;
- Leave the machine and the surrounded area clean;
- Check for fault and malfunctions

7.2 Prohibitions

The following represents what is expressly forbidden during the processing phases of the machine:

	It is forbidden as well as dangerous to use the machine for purposes other than those intended (air sanitation)

	No part of the machine must be removed or tampered with
	Do not remove or render ineffective the guards
	Do not make any modifications to the machine unless expressly authorized by the manufacturer
	Do not dispose of removed and / or replaced parts into the environment
	Do not carry out maintenance activities on the machine unless you have made sure that it is disconnected from the electrical network and that it is not possible for it to start up autonomously
	Do not perform any cleaning activities on the machine while it is running
	Do not modify the machine for any reason with respect to the purposes intended in the design and construction phase.
	NEVER use the machine in unforeseen environmental conditions
	Do not use the machine with “flying” type electrical connections or by means of temporary or non-insulated cables
	Do not modify the functional / performance characteristics of the machine and / or its components in order to increase its potential
	NEVER use spare parts that are not original and / or not foreseen by the manufacturer
	Do not entrust repairs to inexperienced personnel
	It is forbidden to use the machine without the protections provided
	In order to insert a classic 10 or 16 Ampere Italian plug into the Schuko socket, an adapter is required
	It is absolutely not recommended to use broken sockets, which show visual damage or which have been briefly fixed with insulating tape

	Never touch the screw of a terminal (eg transformer) especially when the voltage is 230VAC.
	In case of incompatibility between the plug of one appliance and the wall socket it is preferable to replace the second.
	Never let the AirBee sanitizing device be left unattended in the hands of children, especially when it is in operation (and connected to the mains).
	It is absolutely forbidden to remove the guards, considering that this operation could improve the air sanitization process

8 Description of the intended use of the machine

The devices, subject of this use and maintenance manual, have been designed and manufactured to carry out an air sanitization process through a photocatalysis process. Our devices, as already described above, are particularly effective for:

- Emergency Rooms, waiting rooms for medical / dental offices, and wherever important air disinfection is required;
- Hotel rooms, classrooms, nurseries, ...

It is mainly aimed at allergic people, asthmatics, children, ... as photocatalysis is able to eliminate bacteria, dust, ... etc.

Optimal use of the machine must ensure that the rooms have good ventilation and / or ventilation.

An appropriate use of the machine allows you to take full advantage of the performance it is capable of delivering. This potential can only be achieved by following the instructions below:

- Check the integrity of the machine components before using it;
- Make sure and verify the suitability of the electrical system as well as the state of use of the connections in order to avoid conditions of potential risk;
- Before carrying out ordinary and extraordinary maintenance activities, it is recommended to deactivate the connection to the machine's electrical network;

- It is not allowed to modify or replace parts of the machine without the prior authorization of the manufacturer;
- Use original spare parts and, if necessary, always consult the manufacturer in advance in case of doubts and / or uncertainties;
- Carry out interventions only if you know exactly the operating procedures or have been well understood.

8.1 Reasonably foreseeaable misuse

LaThe machine cannot be used for the following activities

- It is not allowed to carry out maintenance work by unqualified personnel and above all without interrupting the mains power supply;
- As a support base for vases or worse for containers full of water;
- Use it without having previously fixed it adequately;
- It must never be used at very short distances from the mouth or nostrils to suck in the air produced by the device.

9 Instructions for installation and assembly aimed at reducing noise and vibrations produced

The machine must be installed, adjusted and maintained in the manner described above. In particular, the filters must be cleaned regularly according to its use and / or the type of environment to be sanitized.

9.1 Noise evaluation

The noise level emitted by the machine is given by the state of use of the fan used, in any case the Leq value is below the values for which hearing protectors are required in order not to be exposed to potential risk situations due to noise.

9.2 Vibration exposure assessment

There are no particular risk situations, relating to exposure to vibrations by the user. The only element of the machine to produce vibrations is the fan which, in the event of damage and / or malfunctions, could lead to an exponential increase in vibrations and therefore damage to the device due, for example, to the bearing block (analysis of machine vibrations rotating) and consequently also potential risk of fire due to overheating of the fan motor.

In the event that noises similar to friction of moving parts are encountered and a burning smell is detected, it is recommended to immediately turn off the device and check the state of use of the device.

Periodically check the condition of the fan, manually checking that the blades rotate without any impediment. Carry out this check in conjunction with the periodic cleaning activities.

10 Residual risks

During the design phase, an analysis of all possible risks was carried out, for which technical solutions were identified that eliminated or reduced them.

As regards those particular risks for which a technical or procedural solution has not been possible, residual risks are defined and a list is given below with the relative protection measures to be adopted. In paragraph **1.3** of this document, reference is made to the personal protective equipment (PPE) that the personnel responsible for machine maintenance must wear to completely eliminate residual risks.

10.1 security risks:

This type of risk is the one that relates to **human-machine** interaction, so we can rightly speak of accident risks.

The security risks are essentially those listed below:

Residual risk	Protective measures to be taken

Entanglement in rotating or moving parts;	The rotating and moving parts of the machine have been adequately protected. However, it is necessary not to wear: fluttering clothes, scarves or any garments that could get caught
Projection of debris or other	The machine is equipped with external covers, do not allow the machine to operate during maintenance activities or the components are not firmly fixed to their housings.

10.2 Risks to health

This type of risk is the one that relates to **human-work environment** interaction. We talk about hygienic-environmental risks.

Residual risk	Protective measures to be taken
Microclimate	Where there is a total absence of ventilation / air recycling, it is necessary to suspend the activity of the machine to resume it in more favorable conditions.
Lighting	Do not carry out maintenance and / or cleaning operations on the machine if the degree of illumination is not sufficient. Use artificial lights when needed. Use artificial light when needed.
Electrocution	Pay maximum attention during maintenance activities. Before proceeding, disconnect the device from the mains power supply. For the total removal of risk and residual risks it is recommended to wear gloves suitable for live activities.

10.3 Risks to safety and health

This risk category concerns **man-work** interaction. That is, it pertains to the relationship between the worker and the work organization in which he is inserted, thus also implying psychological and ergonomic aspects.

Residual risk	Protective measures to be taken
Work organization (shifts; monotony of duties, etc.)	Organize the work in an optimal way
Difficult working conditions	Simplify the various work activities by breaking them down into elementary phases and providing

	operating instructions to the workers who deal with the maintenance of the machine

11 Method to be followed in the event of an accident or breakdown

The basic legislation of the guidelines is constituted, in order, by the laws of the State already in force that give the knowledge for the prevention of accidents and occupational hygiene, as well as by the European directives implemented and transformed into laws that apply to the field of machines and in general working environments with particular regard to industry, where the presence of machines for cold metal working is significant. Specifically, the sanitizing machines are examined, with reference to the "dangerous area" understood as: "any area inside and / or near a machine in which the presence of an exposed person constitutes a risk to safety and health of that person ";

- By exposed person we mean: “any person who is wholly or partially in a dangerous area”;
- By operator we mean: "the person or persons in charge of installing, operating, adjusting, maintaining, cleaning, repairing and transporting a machine" (1.1.1 Definitions - Annex I DPR 459/96) .

For the device covered by this use and maintenance manual, fixed guards have been designed and built for the analysis and consequent risk reduction. In the event of an accident, it is necessary to immediately block the machine and set up a free corridor through which the injured person can be reached.

Before administering any type of medicine, the existence of personal impediments must be verified, such as allergy to particular drugs or molecules.

Before any direct rescue operation, medical assistance must be immediately alerted by calling 118 and / or the doctors on call in case of accidents at work.

In the event of a fault, on the other hand, the machine is put into a lockout state and all checks and tests are carried out to identify the cause that generated the fault. If the cause is not immediately identified, the machine must be taken to the workshop for necessary repairs.

In the case of routine maintenance and / or due to machine failure, it is always necessary to follow the prescriptions and prohibitions contained in the use and maintenance manual.

12 Transport – Storage

The machine is shipped using packaging capable of withstanding the normal treatment undergone during transport. Once received, the unit must be inspected to detect any damage that may have occurred during shipment due to incorrect handling. In case of damage, the transport company that delivered the unit must be notified immediately.

Upon receipt, it is recommended to carry out the following preliminary checks:

- Check that the machine and any accessories are intact and in perfect condition (no traces of rust, humidity, no dents, etc.);
- Check the integrity of the wiring of the electrical system (breakages, crushing, etc.), also check that they are all correctly locked with the appropriate clamps;
- Check the efficiency of the earth leakage system;

For storage or storage during periods of non-use, the following indications must be observed:

- The machine must be carefully cleaned with the removal of all residues. All cleaning operations, of any kind, must be carried out with the machine without power supply.
- After washing, the machine must be dried and placed in a dry place protected from bad weather, possibly on a pallet of adequate size and structural consistency.
- Once the cleaning operations have been completed, it is necessary to check the condition of the fan (see paragraph 6.1.2) and clean it of any layers of dust as well as lubricate it.

13 Recovery after a period of inactivity

After a period of no-use of the machine it is necessary:

- Carry out a general visual check to make sure there are no damages to the structure;
- Check that the signs on the machine are intact and perfectly legible. Otherwise, replace it;
- Check the integrity of all components;

14 Safety signs on the machine

In order to complete the series of actions aimed at making the machine safe, specific signs have been applied to the same which, with the relative pictograms, indicate where the risks are present. The following figures show the signs that are present on the machine and are used to inform and signal any dangerous situations and / or rules to be observed near the vehicle.

Machine safety sign			
			
ATTENTION: Read the instruction manual before doing any Machine intervention	**ATTENTION:**: Read the instruction manual before doing any Machine intervention	**DANGER** of injury to the hands; don't get close to the car before that all organs are still.	**DANGER** of throwing material from the machine - Stay at a safe distance (indicated in the instruction manual).

15 Instructions for decommissioning and disposal of the machine

15.1 Disposal of components and materials

When the machine should be scrapped, its parts must be disposed of separately, taking into account the different nature of the same (eg: metals, plastic and rubber, etc.) by appointing, in this regard, specialized and authorized companies, in compliance with the provisions of the law in force regarding the disposal of industrial waste. Therefore, at the end of its operating cycle, the machine must be taken out of service, observing the application of the following procedures, to respect the environment:

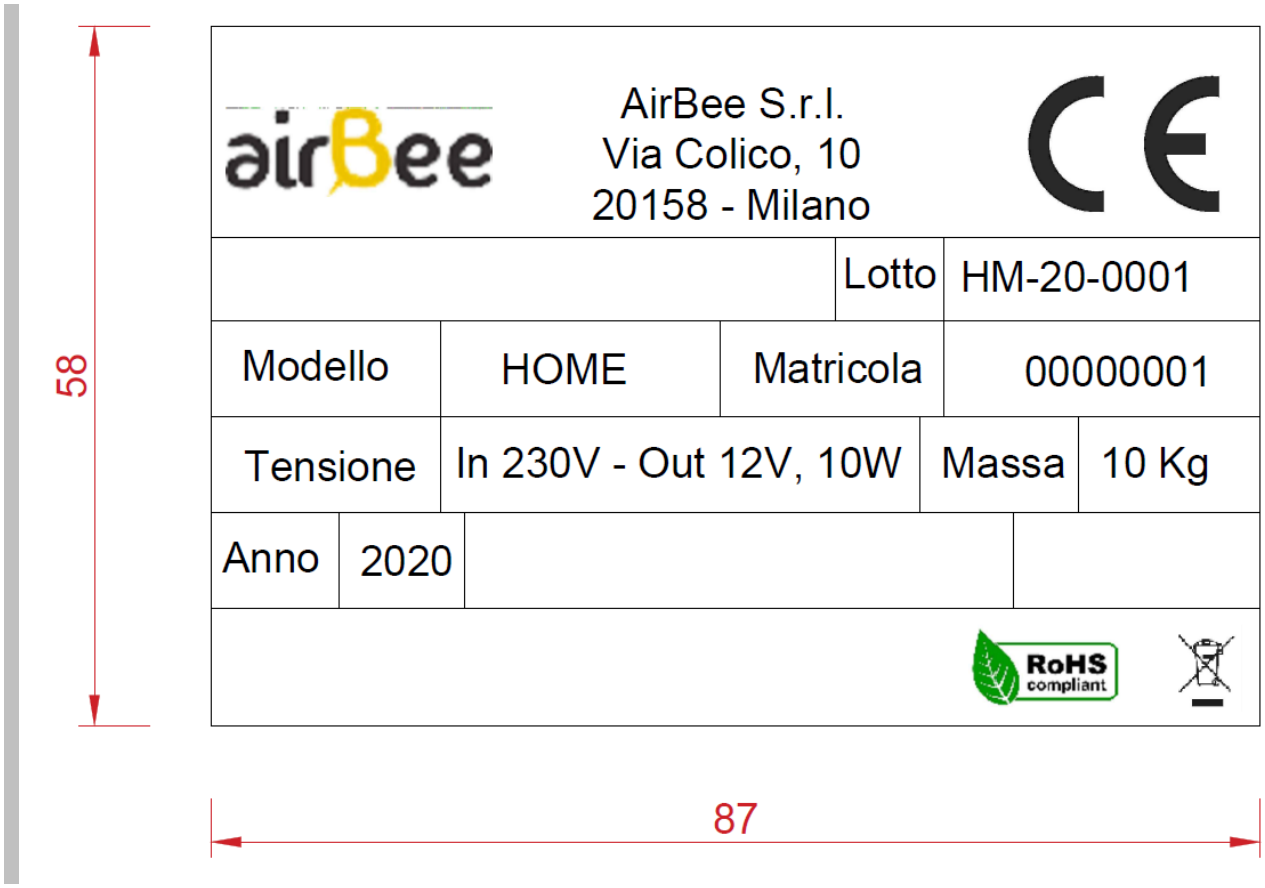
- The machine, cleaned of pollutants, will be entrusted to an authorized demolition company for its disposal;
- In the event that the machine is given to steel mills, not as waste but as scrap to be recycled, then it will be necessary to comply with the new **EU Regulation 333/2011** for the treatment of metal scrap.

 **Do not leave the machine or its components in transit areas as this could constitute a risk condition for people and / or animals. Any liability cannot be charged to the manufacturer.**

Failure	Possible cause

Excessive machine vibration	● Insufficient tightening of screws or bolts; ● A possible impact may have deformed some elements (e.g. fan); ● Uneven wear of the fan. In this case it will have to be repaired.
Excessive machine noise	● It could be due to a malfunction of the fan or to its friction on the external cover of the device; ● If the noise persists, it is necessary to carry out a more careful analysis of the machine as the friction could lead to consequent risk situations.
Maximum time of inactivity	After 180s without any activity on the part of the machine, perform a reboot by switching the machine off and on again.
Breakdown or failure of your electrical equipment	Presence of an electric arc or incorrectly insulated connections.

16 CE PLATE


AirBee S.r.l.
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CE
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Tensione
In 230V - Out 12V, 10W
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87