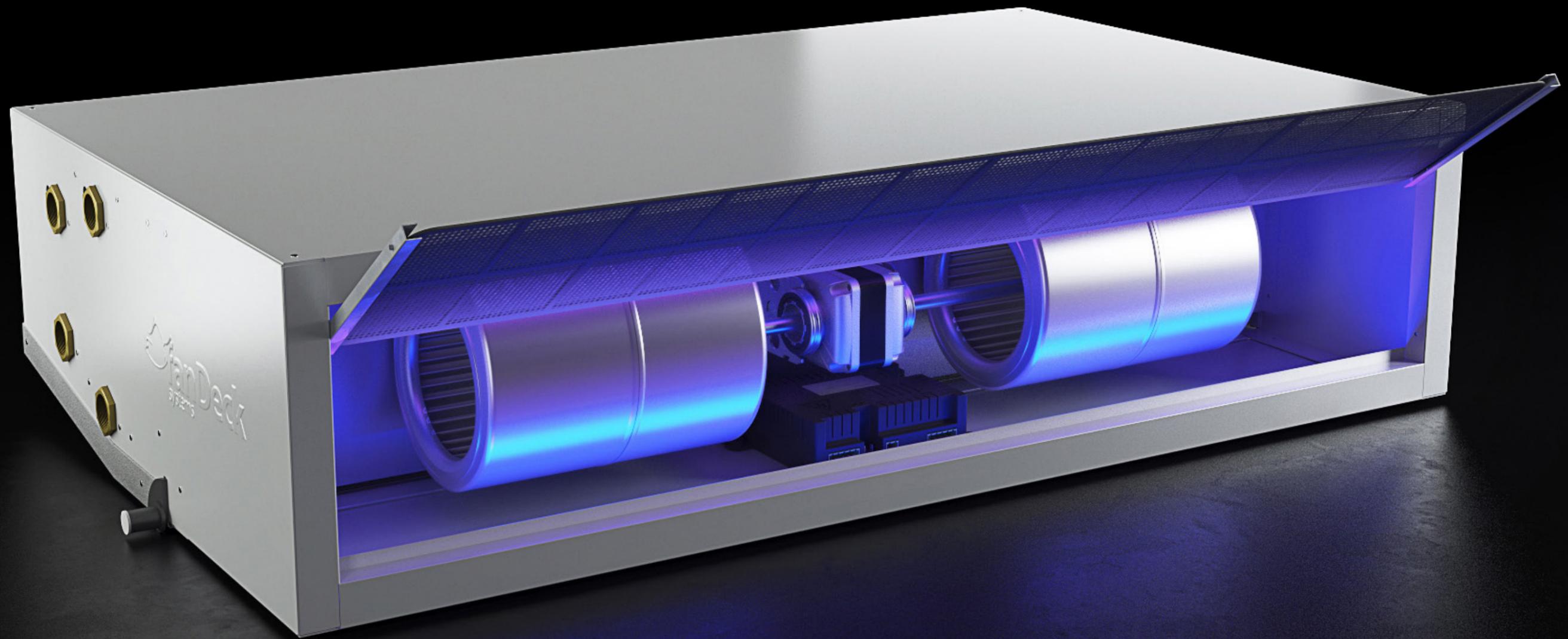




ELECTRONIC FANCOIL EFC UV

The complete solution for energy efficiency
and air purification.



The data speaks for itself:

767.401 Kw-h

Saved in a year at a leading hotel facility.

138 Tm CO₂

Not emitted to the atmosphere.



ENERGY EFFICIENCY AND SUSTAINABLE DEVELOPMENT

In addition to the savings due to the lower consumption of fans, most of the total savings are due to the progressive demand for power, from the rooms to the heating and cooling plants, through the FanCoils. In this way, production plants manage power delivery better and achieve savings of up to 10% of their total consumption.



OUR MISSION: ENERGY EFFICIENCY

We design equipment that contributes to achieving significant energy savings especially in hotels, hospitals, office buildings and public facilities.

A success story.

As an example: an emblematic 4-star business hotel in Barcelona, with 363 perfectly maintained rooms.

After several years of tests and trials, the management of the hotel group decided in 2018 to change all the FanCoils in the building for our high efficiency electronic equipment.

The results.

Having only changed the FanCoils in this period, the energy consumption for the whole of 2019 compared to 2018 was a reduction in electricity consumption of: **767.401 Kw-h**

There are few investments in this type of facility that offer such a rapid return on investment and that are also eligible for so many subsidies.

These incentives are currently reaching all territorial areas, from the European Union to local corporations themselves, as well as regional and state authorities.



EFC UV FANCOIL

With the application of high power UVC germicidal lamps, we have converted our electronic FanCoils into an authentic air purifier for all spaces.

All the air in a space passes more than 10 times an hour through the air conditioner. Viruses, bacteria, fungi, suspended particles and all undesirable elements will be eliminated as they pass through the equipment creating a microclimate of clean air.



The challenges of good health and safety in hotel facilities

Ultraviolet Radiation UVC

Currently there are two methods of disinfection with proven results: ozone spraying and sterilization by UVC lamps

Ozone, however, has the disadvantage of being an unstable and potentially toxic gas. When it exceeds certain emission levels within a space, it can cause irritation to the respiratory system, particularly in people who suffer from asthma or who are prone to allergies.

Sterilization with high intensity UVC lamps is the most powerful natural germicide commonly used worldwide in the disinfection of critical areas in hospitals.

It is especially effective against bacteria, viruses and fungi.

Microorganisms are deactivated by UV light by destroying their nucleic acids.

Cellular DNA and RNA absorb energy emitted by short-wave UVC radiation, mainly between 250-280 nm.

This absorption of UV energy prevents replication and therefore its ability to infect.

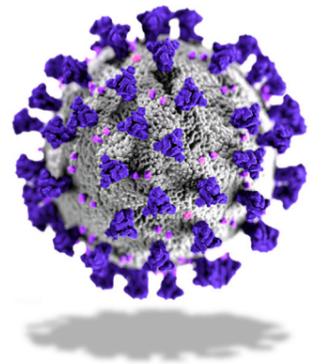
About COVID-19

Although there is still a lot unknown about the transmission, severity and possible evolution (mutations) of this lethal virus, it is believed that the spread of the new coronavirus occurs exclusively through close contact (about 1.5 m) by respiratory droplets from coughing and sneezing from an infected person, as in flu and other respiratory diseases.

The droplets can cling directly or through contact with the hands, mouth, nose and eyes and can thus cause the virus to spread to the lungs.

Despite the compliance with the safety distance, by remaining for a certain period of time in the air, the droplets may infect people who share the same space.

The already known coronaviruses have also been shown to be vulnerable to UVC emission in variable doses. Viruses such as COVID-19, in the air can be eliminated by exposing them to certain amounts of UVC.



The fancoil as the main source of well being in the room

The fancoil is the ideal element to install the UV disinfection equipment due to the following reasons:

- They are already present in all hotel rooms and hospitals, which makes it unnecessary to create new equipment and incur the associated costs.
- The fans are placed in an isolated and watertight area in relation to the space occupied by people.

• The lamps are located at the rear of the fancoil (aspiration area), so that the light from the radiation is not visible, even when the lights in the room are off.

• The total volume of air of the room passes through the ventiloconvector 10 times per hour eliminating all microorganisms.

What better place to create a health barrier?

TXK-EC.UV

THERMOSTAT

Through the thermostat, we have absolute control of all the elements necessary for ideal and safe comfort.



The thermostat as a control centre, ensures the optimal functioning of the disinfection system

For germicidal lamps to be most effective, the time they are turned on as well as the air speed at those times must be controlled.

Only then will the pathogenic elements be irradiated long enough and with the necessary energy for their elimination.

In collaboration with SISTENA, in our opinion the best and most specialized company in the control of air conditioning systems in Spain, we have developed the most precise control equipment for this purpose.

Besides acting as a proportional thermostat to change the fan speed according to the pre-selected temperature, it has new features:

- Switching the UV lamp on and off according to the time set. By default, it will be adjusted from the factory to a period of 10 minutes for each hour of fan operation. This period in minutes will be adjusted from the thermostat itself, by authorized personnel.

- Setting the fan speed to 30% of maximum speed at the time the UVC lamp is running, whatever the speed of the equipment is at that time. In this way we reduce the air speed to the ideal point, so that the radiation on the microorganisms suspended in the air has the longest possible duration.

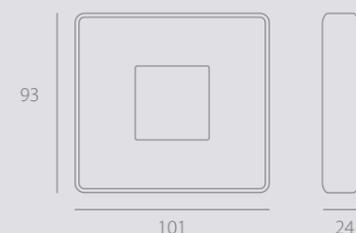
- Present on the thermostat display itself is an icon that indicates when the lamp is on, thus allowing maintenance teams to perfectly control the operation and its cycles, without the need to be in contact with radiation.

- Protecting the safety of maintenance personnel by monitoring a sensor PIR, which turns the lamp off in case of motion detection around the fan.

Total control

Besides controlling the temperature in the room, varying the fan speed and programming the UV lamp activation and deactivation cycles, this thermostat incorporates all the main functions required in the efficient management of hotel and hospital facilities:

- Window sensor
- Room user sensor
- RS-485 Modus RTU serial communication



UVLAM60 and UVLAM120 LAMPS

With the application of high power UVC germicidal lamps, we transform electronic fans into authentic air purifiers.

The lamp as a key factor in the disinfection process

Until now, the most commonly used were mercury vapor lamps or reactor fluorescent lamps.

Today, LED diodes have proven to be the most efficient, sustainable and environmentally friendly lighting technology in all fields.

In the search for the most suitable lamps for our FCE and FMAX equipment, we have developed the power ratings (60 and 120 mW) that are in line with the essential objective: to emit the necessary intensity, for the short time that organisms are in contact with radiation.

As an example, according to the Institute of Interactive Systems Biology of CESIC, to eliminate 90% of the flu virus, 29 mW/cm² is needed.

All this had to be achieved without ignoring energy consumption. It would not be effective to install a lamp whose consumption would be higher than that of the fan, as occurs with other technologies.

This is why we have installed these UVLAM lamps whose main features are:

- High lighting efficiency.
- Minimum energy consumption.
- No dangerous or polluting products used.
- Low carbon footprint in its production.
- Complies with CE standards of electromagnetic compatibility.
- Do not produce any appreciable heat.
- **More than 60.000 hours of service life.**



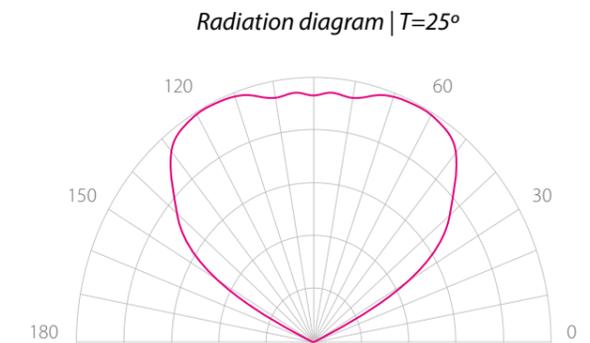
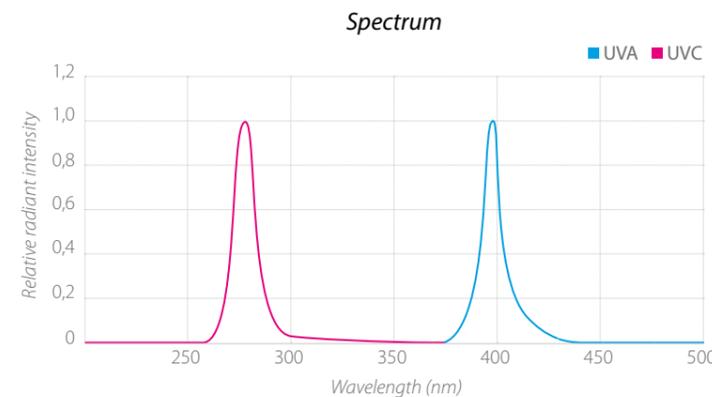
The PIR sensor as a protector of people's safety

Shortwave UVC radiation can harm people in prolonged exposure. This is why we use an infrared sensor, which detects a person's body temperature at a distance of 4 meters, which allows the lamp to be switched off when an intervention on the ventiloconvector occurs.



UVC radiation eliminates up to 99% of bacteria, viruses and germs in the air and on surfaces.

Today, many hospitals and similar facilities use this type of light to kill bacteria and viruses.



MODEL	RADIATION POWER	WAVELENGTH UVC	WAVELENGTH UVA	VOLTAGE	CONSUMPTION	DIMENSIONS
UVLAM60	60 mW	265 - 315 nm	390 - 410 nm	100 - 240 VAC	9,9 W	588 mm x Ø26 mm
UVLAM120	120 mW	265 - 315 nm	390 - 410 nm	100 - 240 VAC	18,7 W	588 mm x Ø26 mm

LOTUS EFFECT

The lotus is an aquatic plant known for the hydrophobic behavior of its leaves in order to repel water and not get wet.

Thanks to this quality the water droplets, keeping their spherical shape, slide to join other drops and drag with them all the impurities that have deposited on the surface, leaving it clean while drying.



Nanotechnology



Nanotechnology is the study and manipulation of matter in incredibly small sizes, usually between one and 100 nanometers.

To put in perspective, a sheet of paper is about 100,000 nanometers thick. Nanotechnology covers a wide variety of materials, manufacturing processes and technologies used to create and improve many products that we use daily.

The condensation collection tray and the "lotus effect"

Air conditioning machines have trays for collecting water that condenses when the air passes through a cold battery.

For the proper discharge of collected water, the machines must be tilted at a certain angle to empty.

But not all water flows towards the drain. Part of it remains in the so-called blind spots, retained both by dirt and oxidized wear and tear, and also due to the surface tension qualities of the water.

This accumulation of water and dirt is a perfect breeding ground for fungi and bacteria, such as Legionella, which can cause serious damage to our health.

To avoid this problem and with the help of nanotechnology, **Fan Deck Systems** equips all its fan trays with a special treatment that reproduces what in nature is known as the "lotus effect".



Heterogeneous photo catalysis mechanism

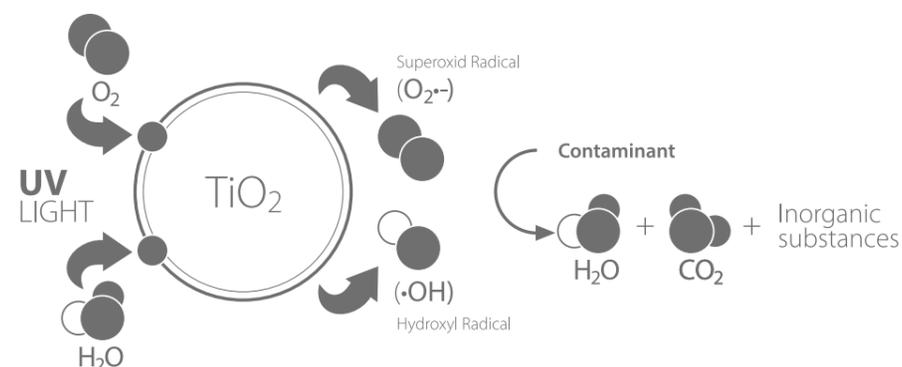


Photo catalysis

Photo catalysis starts from the principle of natural decontamination of nature itself. It is a photochemical reaction that converts solar energy into chemical energy on the surface of a catalyst or substrate.

A catalyst is a substance that accelerates a chemical reaction without being consumed by it and consists of a semiconductor material, titanium carbon dioxide (TiO_2).

Photo catalytic oxidation occurs when UV light (sunlight, fluorescent light or UV LED) activates titanium dioxide (TiO_2) and triggers two chemical reactions that lead to the instantaneous formation of hydroxyl radicals ($OH\cdot$) and superoxide anions ($O_2\cdot^-$).

• **Hydroxyl radicals ($OH\cdot$), the most powerful, non-poisonous, oxidizing agent in nature**, are formed when sunlight-energized (TiO_2) extracts a hydrogen atom from water vapor H_2O in the air (humidity).

Hydroxyl radicals formed on the treated surface aggressively attack the carbon hydrogen bonds, which are present in all organic molecules, over and over again, until nothing else is left in the oxidation process except water and a small amount of CO_2 .

• **Superoxide anions ($O_2\cdot^-$), one of the strongest reducing agents in nature**, are formed when molecules of oxygen in the air (O_2) interact with TiO_2 through light energy and receive an extra electron. ($O_2\cdot^-$).

These superoxide anions interact with NO_x (the largest greenhouse gas that retains heat and the key ingredient of acid rain and pollution) turning it into benign nitrates.

TiO_2

The photo catalytic ceramic foam, once activated via UVA light, instantly eliminates all microorganisms, bacteria and viruses that come in contact with its surface.



EFC-UV FANCOIL

The complete solution for energy efficiency and air purification.

BATTERY

One or two batteries for 2 and 4 tube installations.

UVC

Shortwave UVC ultraviolet radiation creates a disinfectant barrier with direct action against microorganisms in the air.

UVA

UVA ultraviolet radiation activates the TiO_2 in the photo catalytic ceramic filter and removes all unwanted elements (organic and inorganic) that come into contact with the filter.

FILTER

Odorless and ecological. Little impact on initial pressure. High dust retention capacity. UL 900 standard: class 2



TRAY

With a nanotechnology-based treatment, we have been able to recreate what in nature is known as the "lotus effect". This prevents the accumulation of stagnant water, where colonies of viruses, bacteria and fungi can proliferate.

ELECTRONIC GMV

As well as achieving the highest energy efficiency thanks to electronic motors, its regulating capacity allows us to reduce the air speed when the UV lamp is connected, thus increasing the germicidal and decontaminating power of the equipment.

TiO_2

The TiO_2 coated ceramic foam is perfect for its task as the intricate structure makes it almost impossible for the elements you want to eliminate to collide with it. Its minimal resistance to air movement ensures maximum performance of the fan at all speeds.



FAN DECK SYSTEMS S.L.

C/Sèquia Benàger, nº15
P.I. Alqueria de Moret
46210 - Picanya (València)

info@fandeck.es
www.fandeck.es/en