Commercial dossier. 2020 Revision

SingularAir

singular green

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What do we do?

SingularGreen has more than 10 years experience designing and constructing projects that integrate **nature with architecture,** with the target of improving the life quality in our buildings.

How do we do it?

We design and construct green walls, green roofs,natural pools, green AC systems and uncommon landscape projects. With several patented systems and more than 10.000 m^2 of vertical garden installed, we are persistently at the forefront of the technology on bioconstruction.

Each **SingularAir system is a tailor-made project,** adapted to give a response to each building, office or home. Our multidisciplinary team composed by engineers, architects and gardeners works to make every project a success, starting from its signing, up to its maintenance.

At SingularGreen we offer complete service, from comprehensive advice on each project and the plant species that suit you best, to its complete execution.

How can we help you?

SingularGreen Group
info@singulargreen.com

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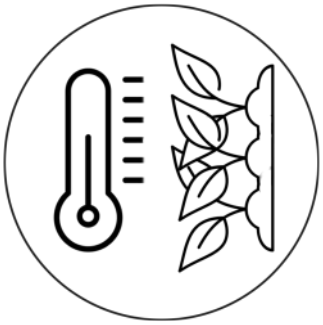
What is SingularAir?

SingularAir is a **vertical garden combined with ventilation system or AC installation**, highly effective on air purification for interiors. The same sensation of freshness and air quality is experienced in a space cooled by SingularAir as when we entered a forest. **Its benefits are the following:**

IT FILTERS AIR POLLUTANTS

The species used help to counteract the "Sick Building Syndrome", since they fix contaminants.



IT REGULATES THE TEMPERATURE

Across the evapotranspiration process of plants, when the air run throught them.

IT ALLOWS TO SAVE ENERGY

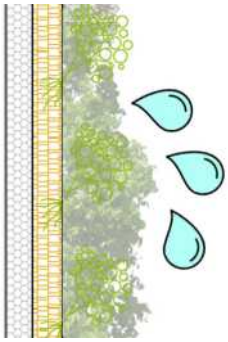
It uses the cooling potential of plants and saves up to 80% of energy compared to a conventional air conditioning system.

Conventional AC: 1Kwh = 0,92 €
SingularAir: 1Kwh = 0,16 €

Vertical Garden at Matimex, Castellón

Green Wall at Ferring offices, Madrid

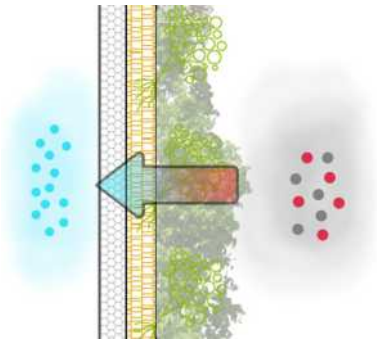
How does it improve the air quality?



REGULATING HUMIDITY

Conventional air conditioning systems lower relative humidity, drying the mucosa of our throat and lungs. SingularAir maintains humidity between 50% and 80%, preventing diseases of the respiratory system.

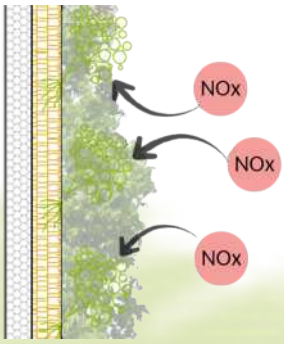
Relative humidity above 50% helps our lungs



FILTERING SUSPENDED PARTICLES

Filters between 20% and 30% of PM10 and PM2.5 suspended particles, when absorbed by plants. Unlike other filters, it does not require cleaning or replacement.

Reduces up to 99% of these particles in 8 hours



ABSORBING SPECIFIC POLLUTANTS

SingularAir is the only system that can effectively absorb a wide range of air pollutants that produce negative effects on our health. In each SingularAir project a selection of species is made to maximize the absorption of specific pollutants. Following we explain the most important ones:

SingularAir Singular Air removes NOx in a closed environment

POLLUTANTS	SOURCE	HEALTH EFFECTS
Formaldehyde	Ply board products, furniture, carpets, water-repellent products, fire-retardant products, natural gas, kerosene, tobacco smoke	Irritating to eyes, nose and throat. It can cause headaches and allergic contact dermatitis
Benzene, Xylene	Inks, oils, paints, plastics, rubber	Irritating to eyes and skin. Prolonged exposure can cause headaches, loss of appetite, and somnolence
Carbon monoxide (CO)	Produced by car combustion engines, firewood and natural gas combustion, tobacco smoke	It combines with hemoglobin in the blood, hindering its correct function
Trichlorethylene	Dry cleaning fluids, printing inks, paints, varnishes and adhesives	It is considered carcinongen
NO_x	Produced by combustion engines, specially diesel engines	May cause skin corrosion, corrosive action on the respiratory tract, burns and skin redness

SingularAir Green Wall installed at SingularGreen offices, Alicante

SingularAir installation steps

The SingularAir installation is designed to work optimally, on existing air conditioning installations or creating a completely new ventilation system. To achieve this, we follow the following steps:

1. MEETING WITH THE CLIENT
We will determine the particular conditions of each project and agree on the vertical garden surface.

2. TECHNICAL INSTALLATION PROJECT WRITTING
We adapt it to the existing installation or create a new one if it is necessary.

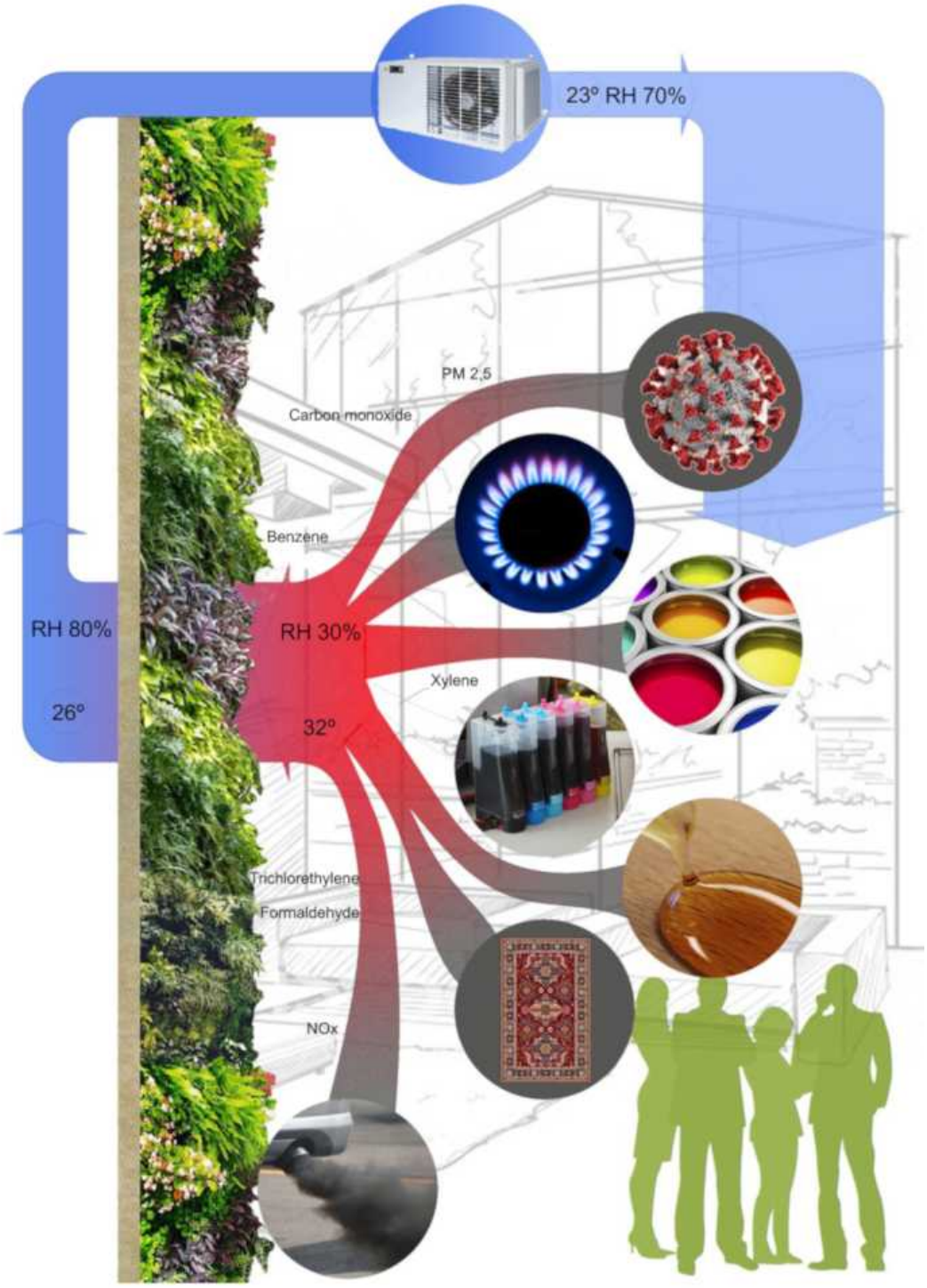
3. VERTICAL GARDEN DESIGN
We do it with the right species to optimize the absorption of specific pollutants. We can previously perform an analysis of air quality.

4. INSTALLATION
We perform the complete installation and planting of the green wall.

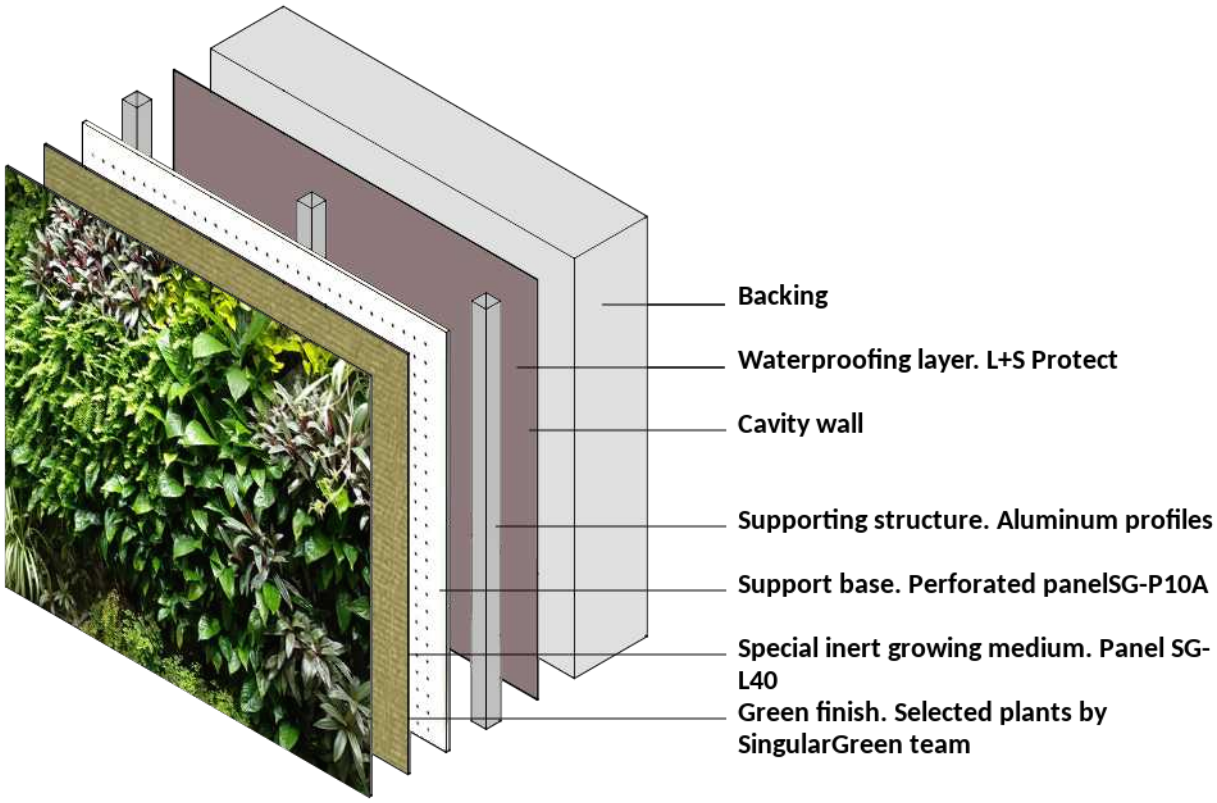
5. MAINTENANCE
The maintenance tasks consist of the periodic pruning of the vegetation, punctual replacements and revision of the system components. In addition, we offer a completely free of charge remote control service.

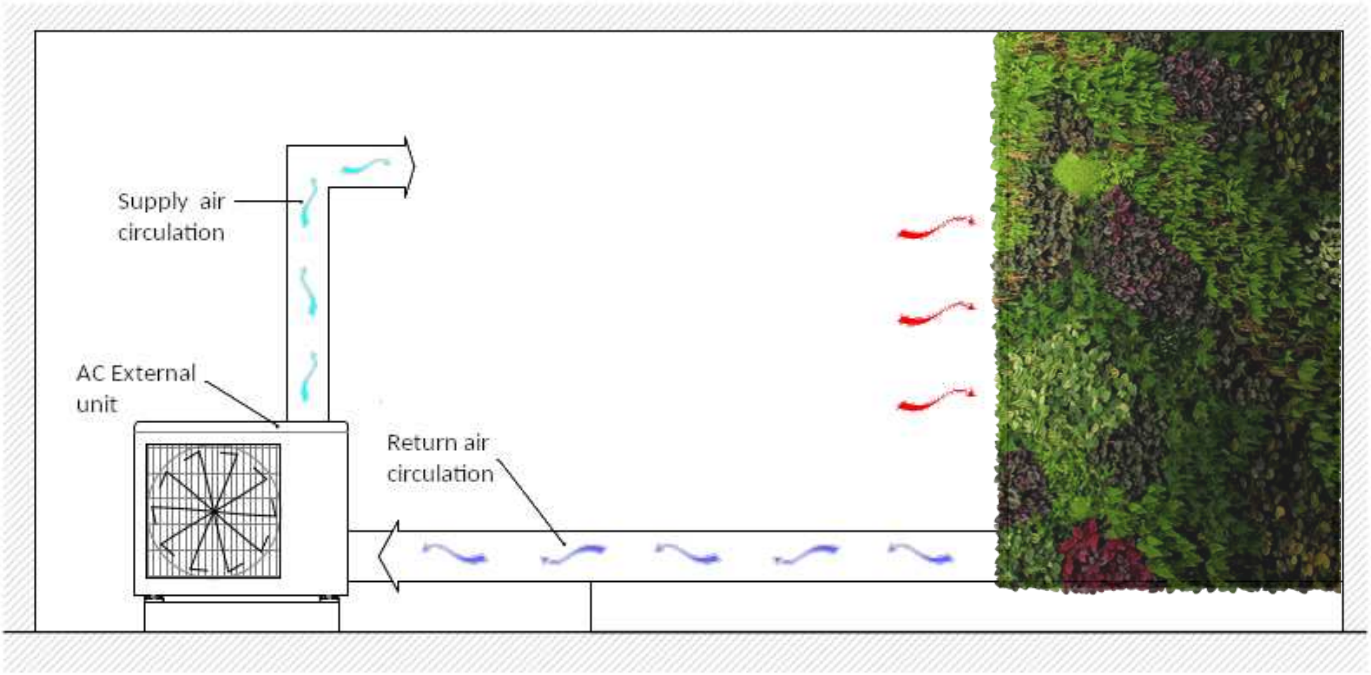
System operation

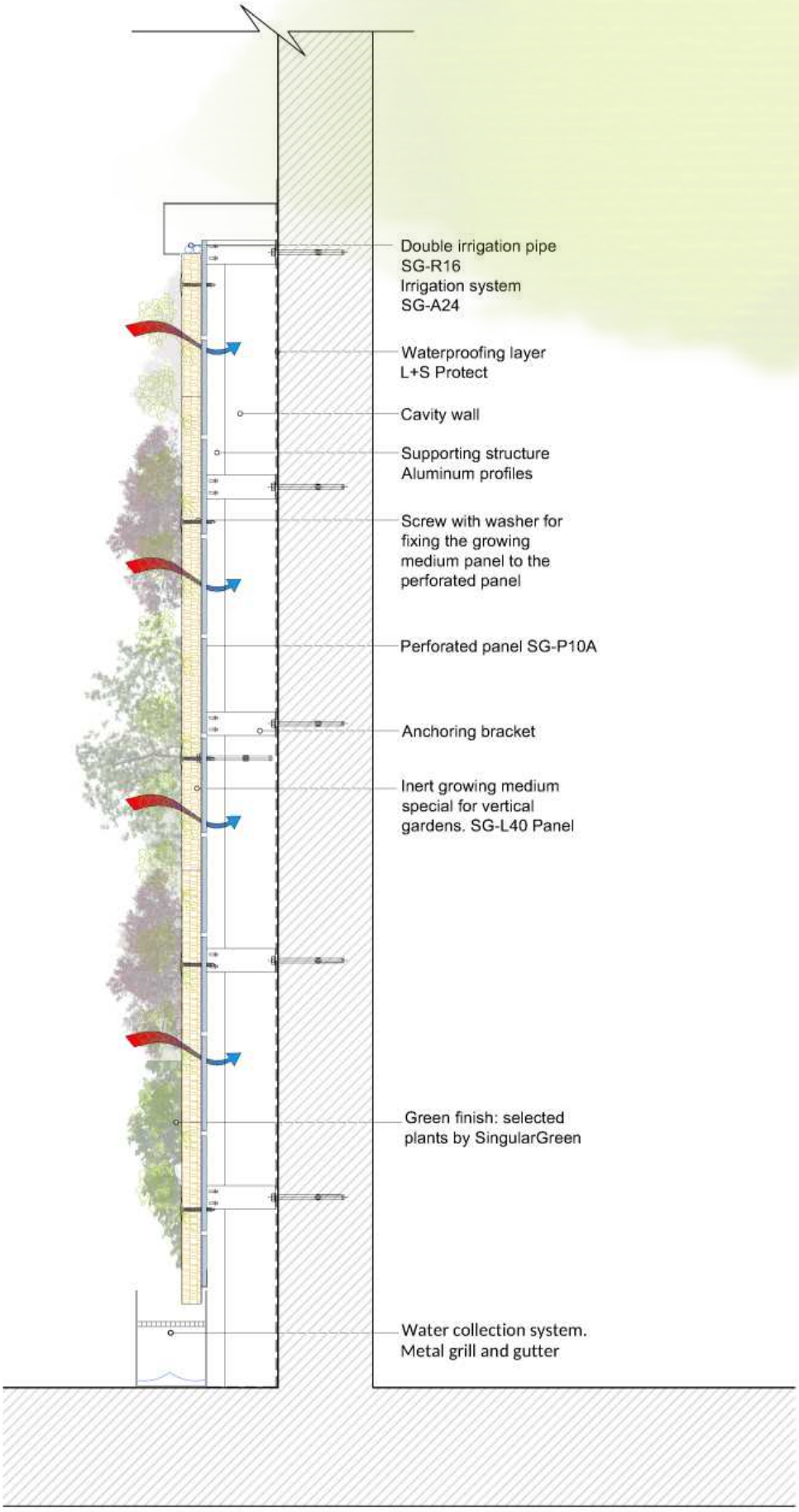
Before reaching the air conditioning machine, the air passes through the vertical garden, which acts as a filter that regulates humidity, increases the energy efficiency of the air conditioning system, and absorbs suspended particles and specific pollutants. The plants, in their objective of cooling themselves, cool all the air necessary to maintain the room at an adequate temperature, providing humidity to the air.



System components






Double irrigation pipe
SG-R16
Irrigation system
SG-A24
Waterproofing layer
L+S Protect
Cavity wall
Supporting structure
Aluminum profiles
Screw with washer for
fixing the growing
medium panel to the
perforated panel
Perforated panel SG-P10A
Anchoring bracket
Inert growing medium
special for vertical
gardens. SG-L40 Panel
Green finish: selected
plants by SingularGreen
Water collection system.
Metal grill and gutter

Installation process

Panels installation over the waterproofing primer. The air will pass trough them**.**

Growing medium placement, in this example it is geotextile SG-M500, as it is a F+P system; however SingularAir can work with no problem with all of our systems.

Installation of AC, irrigation system and spotlights for illumination.

Growing medium preparation. The openings on the geotextile, where the plants will be placed, are done, and the design is drawn.

Planting of species, after the irrigation system is started up. The species are planted one by one in this case.

Finished planting.

After three months the garden is fully covered.

Sizing your SingularAir garden

The garden sizing is approximate, for each project it will be calculated exactly according to their singularities:

Room dimensions (m^2)	50	100	200	400
Vertical Garden surface required (m^2)	6	12	24	48

Vertical Garden at Santa Ponça, Mallorca

Can the vertical garden be placed on exteriors?

SingularAir is intended as a recirculation and filtering system for indoor air. We could use the vertical garden as a pre-filtering system for air coming from outside but we would lose both energy and filtration of particles and pollutant efficiency.

Does it help on Coronavirus prevention?

SingularAir prevents on COVID-19 spread in a direct way: filtering the virus and creating a high relative humidity that makes its propagation difficult, and also in an indirect way: improving the health of our respiratory system.

Maintaining a humid environment in closed places helps to stop the virus. According to a recent Yale University study published in the Annual Review of Virology, as humidity increases, the spread of the virus decreases. To demonstrate this, they carried out an experiment with various animals, but specifically with guinea pigs, since they have properties similar to those of humans, and it was as follows:

Four pairs of infected and uninfected guinea pigs were placed in climatic chambers such that air flow was directed from the infected guinea pigs to the uninfected guinea pigs. At 20 ° C, virus transmission was observed low with a high relative humidity (80%). In contrast, transmission was highly efficient at low relative humidity (20–35%) at 20 ° C. Viral transmission was generally more efficient at 5 ° C compared to 20 ° C. With this, what is shown is that cold and dry air, which is usually typical of seasons such as winter, helps viruses such as SARS-CoV2 to spread more favorably among people. But as an increase in humidity occurs, the risk of transmission decreases.

Keeping a humid environment impproves immune response

The Akiko Iwasaki study from Yale University found that animals that became infected with a relative humidity greater than 50% developed stronger immune responses to the virus than those that counted the disease in dry environments. Our lungs are better prepared against the coronavirus if we take care that the mucous membranes are moist.

Maintaining a low level of pollutants reduces the rate of contagion and mortality

Air quality is being pointed out in recent days by scientists as a facilitator of contagion and a determinant of COVID-19 mortality. The European Public Health Alliance verified that pollution can increase the risk of mortality from COVID-19. This is produced by toxic particles in the air which can develop respiratory diseases, hypertension and diabetes. If we place it together with a conventional AC installation, Singular Air complements the system, the vertical garden acts as a pre-filter and reduces energy consumption in summer.

To conclude, it is important to highlight that, although we reduce the spread by improving air quality, the virus can continue to be spreaded between close people and through surfaces, so you should continue to wash your hands and practice physical distance.

Do insects appear in the vertical garden?

No insects appear, we use natural products in the irrigation system that prevent their appearance, their main objective is to preserve the health of the plants.

Does water consumption increase?

SingularAir increases water consumption while reducing electricity consumption, each liter evaporated produces 0.64 kWh. In terms of sustainability and ecology, consuming water for cooling effects is six times more efficient than consuming electrical energy.

Can high humidity levels damage electronic devices?

The system does not harm electronic devices, since the self-regulation of the system prevents the humidity levels reach 100%.

How can I calculate the surface that I need for the vertical garden?

4 m^2 of vertical garden is the complementary surface of a conventional 2.5 Kwh air conditioning unit that can heat an 80 m^2 house. However, this equivalence can change depending on the climate, humidity, temperature and species of the vertical garden. Our technicians are at your disposal for any questions.

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