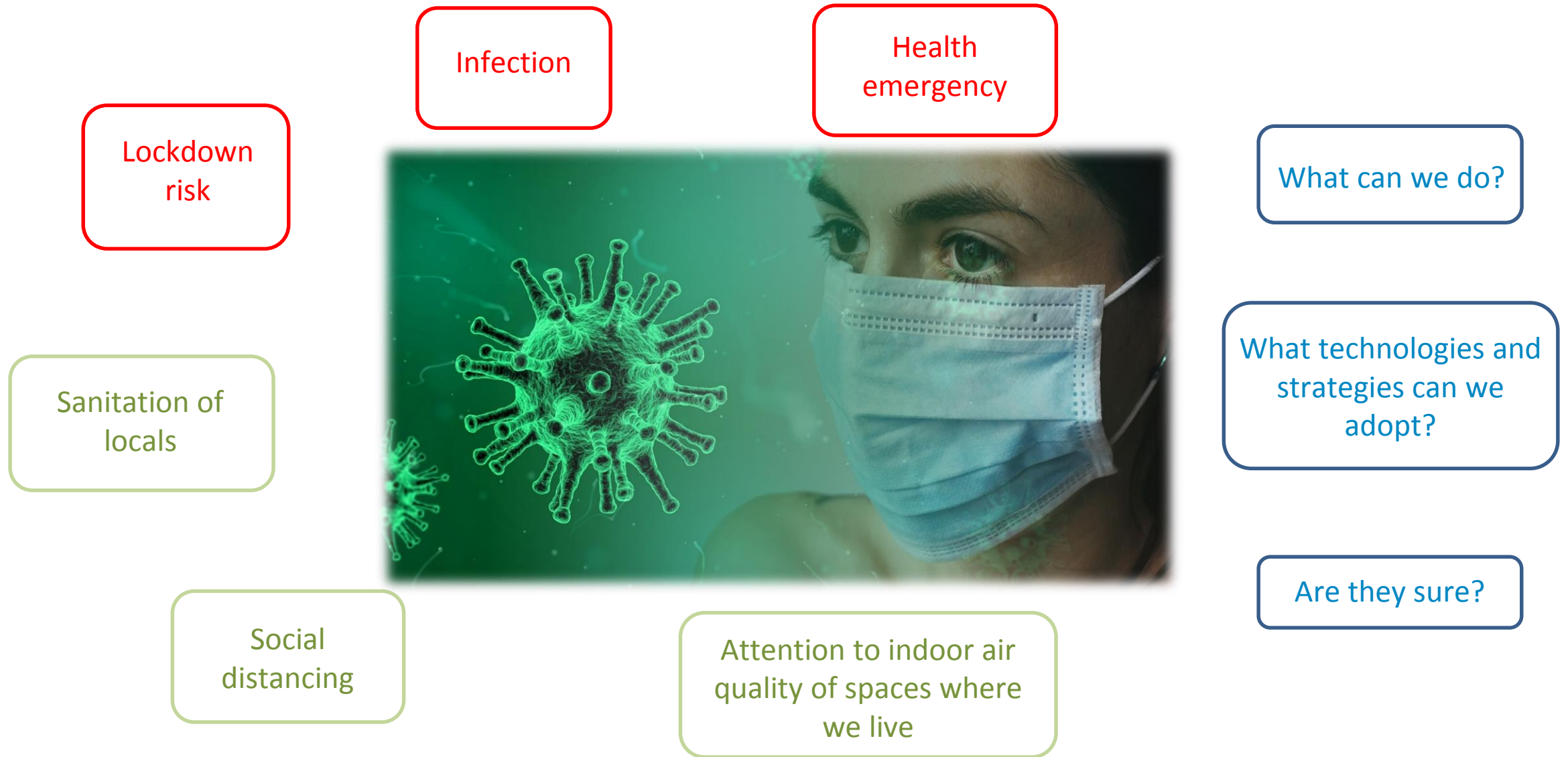




CLIVETPack2 SOLUTIONS

For containment of outbreak of SARS-COV-2

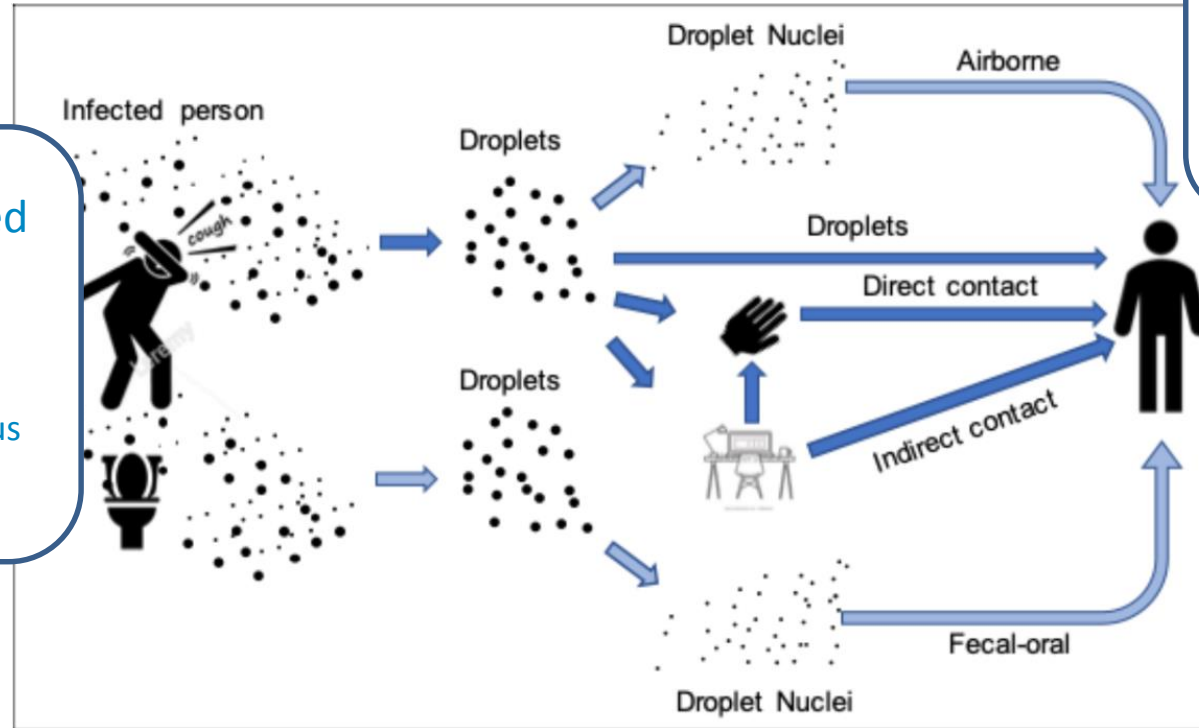
A global challenge: to face to outbreak of **Coronavirus**



Coronavirus transmission modes

Direct contact with infected people

Handshakes and object sharing, bringing the hand towards mucous membranes



Droplets

Emitted by breathing, talking, coughing up and sneezing

Indirect contact with contaminated objects and surfaces

bringing the hand towards mucous membranes

Recent studies state the Coronavirus survives up to 3 hour in the air and up to 2/3 days on surfaces.

Pic. from Francesco Franchimon

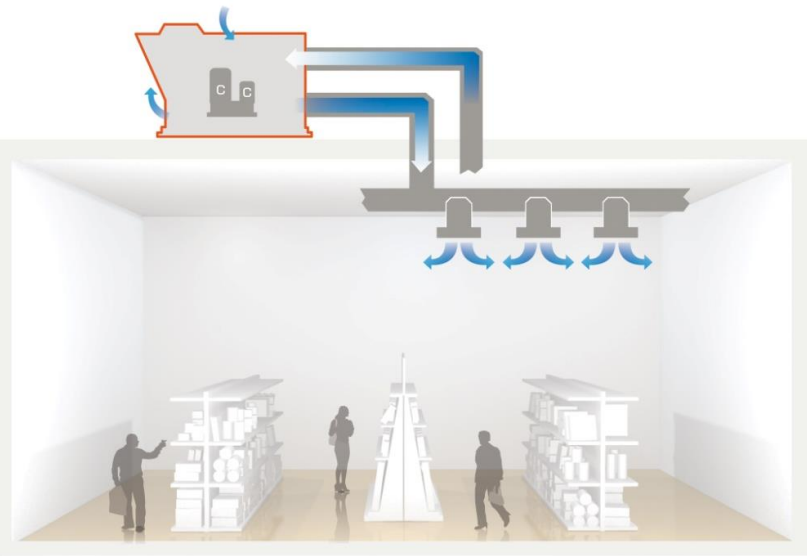
Main practical measures by National and International Associations - 01

- Ensure a social distancing between people higher than 1,5m
- Improve the air ventilation for building in order to dilute virus contaminants
- Reduce the recirculation of potential contaminated air
- Wearing masks to avoid drople emission
- Often clean hands
- Clean surfaces of potential contact



And what can be done regarding our HVAC systems?

Main practical measures by national and international associations - 02



Increase the specific amount of fresh air per person

- Conditioning system
- Mechanical ventilation
- Natural ventilation

Do not change heating, cooling and possible humidification setpoints

COVID-19 is well resistant to ambient changes

Avoid air drafts inside

Decrease the number of people inside

Social distancing

Air ventilation in operation h24

Both during night and without people inside

Keep toilet ventilation in operation 24/7

Keep these locals in negative pressure

Keep going with regular system maintenance

Being this an extraordinary period, specific actions for environmental health could affect the indoor thermal comfort

Solutions by **Clivet**

Fresh Air
Management

Supply air
purification

Further technologies
effective on virus

Solutions by **Clivet** : ensure a better air quality

Fresh Air
Management

Supply air
purification

Further technologies
effective on virus

Further increase of fresh air according
to the technical feasibility

- Fresh air damper parameters set
- CO₂ e CO₂+VOC modes parameters set

Increase the People distancing

- Reduce the number of people inside the building with an immediate increase of the amount of fresh air per person

Ventilation always in operation (24/7)

- Possible reduction of air flow rate and setpoints nighttime

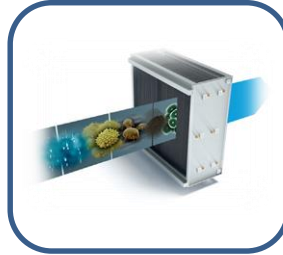
Ensure indoor Comfort and
Safety for people

- Increase the amount of fresh air per person
- Ensure a continuous dilution of indoor polluting elements

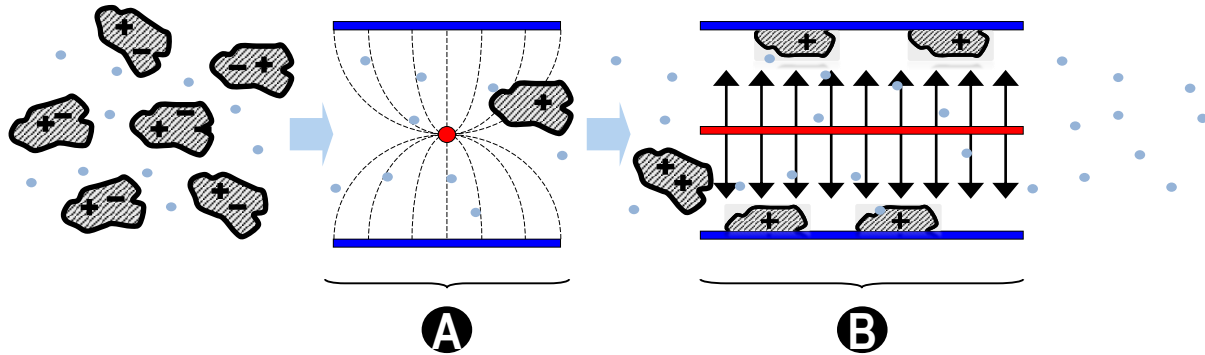
Solutions by Clivet: Electronic filtration - 01

Fresh Air Management

Supply air purification



Further technologies effective on virus

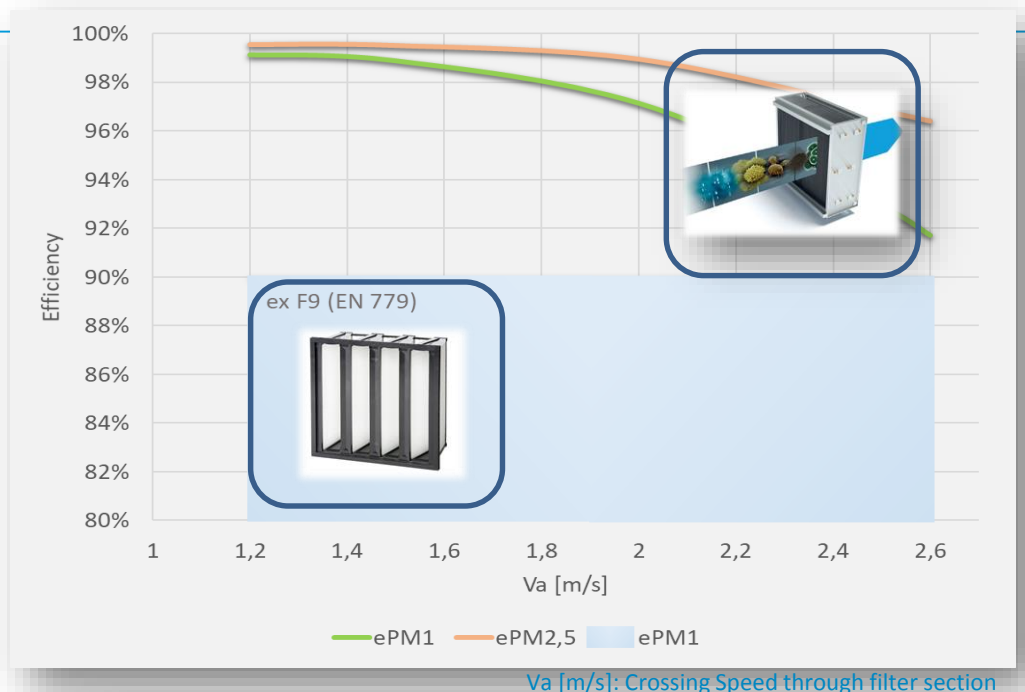


A
Ionisation phase

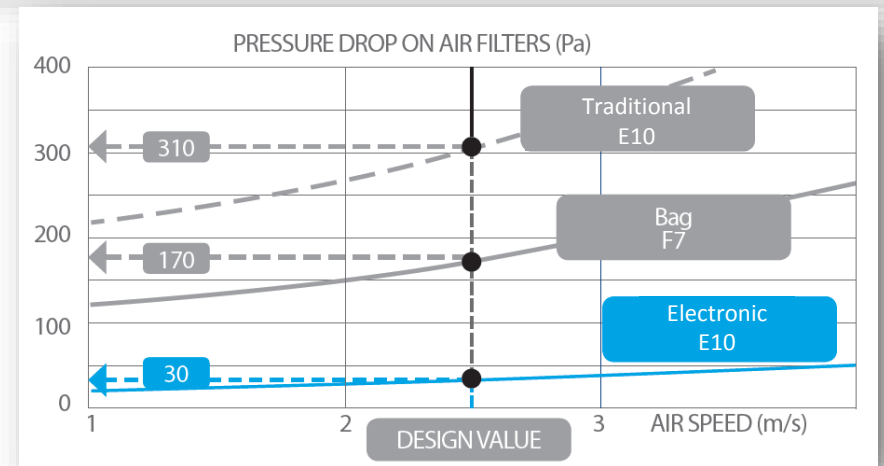
High voltage electric wire 10 kV.
Positive ionisation electric field
Corona effect

B
Capture phase

Electric field of catchment
with positively charged
and grounded plates



Va [m/s]: Crossing Speed through filter section



Solutions by **Clivet**: Electronic filtration - 02

Fresh Air
Management

Supply air
purification

ISO 16890 ePM1 90%

Efficient filtration of airborne particulate
and chemical and biological contaminants
(also virus)

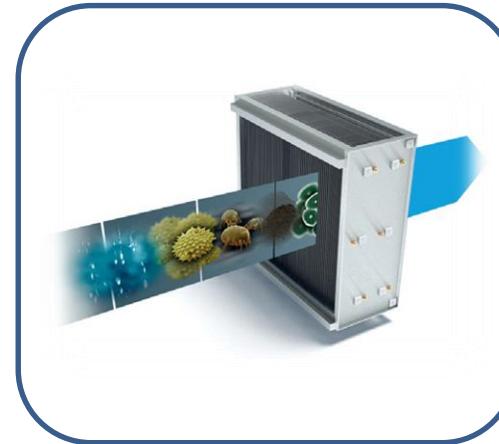
Very low pressure
drops

→ Lower ventilation
consumption

Further technologies
effective on virus

Easily washable and
maintained

→ Similar lifespan as the
whole unit



Capture and inactivation
of airborne virus thanks to
high voltage (10 kV)

→ Airborne virus capture and
inactivation by an electrostatic
particle collector

Bacteria and molds filtration with
certified efficiency of 99%

→ Institute of Air Hygiene of Berlin (ILH)

Solutions by **Clivet**: germicidal UV-C lamps

Fresh Air Management

Supply air purification

Recognized technology by ASHRAE

Ultraviolet air and surface treatment

Further technologies effective on virus

Ultraviolet radiation effective on Virus (wavelengths - 254nm)

Rapid inactivation of SARS-COV-2 with ultraviolet irradiation

UV-C irradiation is highly effective in inactivating and inhibiting SARS-COV-2 replication



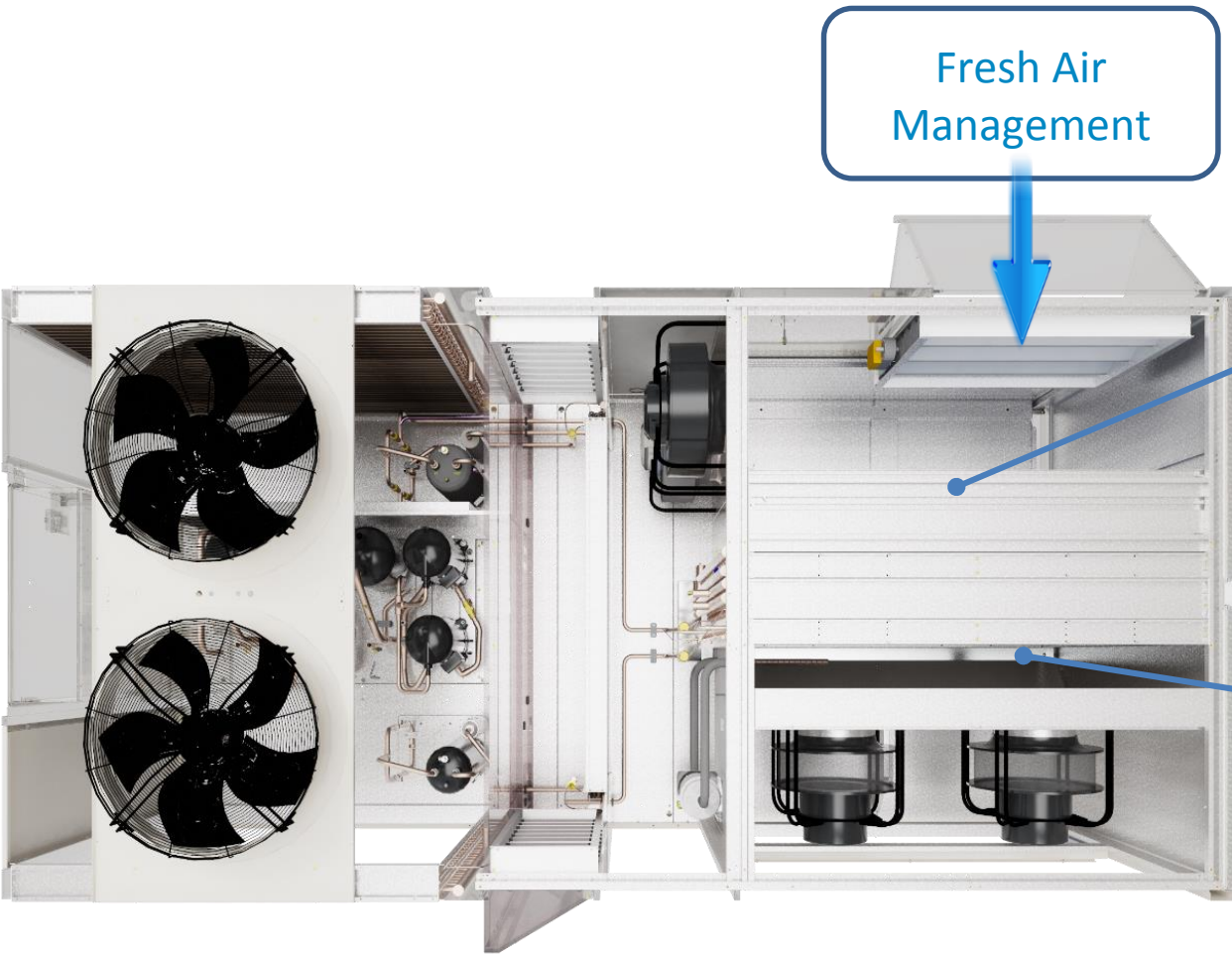
Recognized technology by IES (Illuminating Engineering Society)

IES - Germicidal Ultraviolet

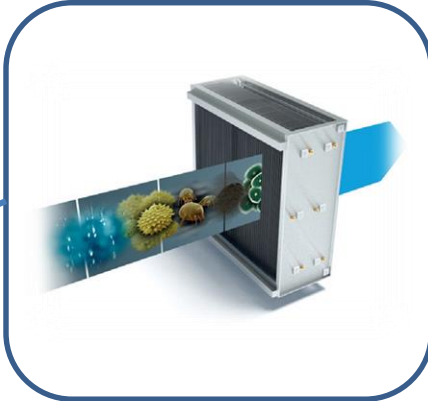
Effective on:

- Supply air flow rate
- Handling coil
- Condensate collection tray

Final summary: Solutions by Clivet



Fresh Air Management



- Available for:
- All Rooftop Series
 - Zephir3
 - Elfofresh EVO and Large
 - ElfoPack



- Available for:
- CSRN-XHE2 15.2-44.4
 - CSRN-XHE2 49.4-110.4
 - CSNX-XHE2 12.3-44.4

www.clivet.com



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 Midea