Decontamination
of room air and surfaces

Safe - Air

Successful against microorganisms, mites, allergens and odor molecules

Cold atmospheric plasma inactivates very efficiently bacteria, funguses, viruses, spores, mites, allergens and fragrance molecules.

Inactivates
- Viruses
- Micro-organisms Disease inducers
- Corona (COVID-19)

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What is cold atmospheric plasma?

A cold atmospheric plasma is a partially ionized gas, i.e. only one particle of 10^9 is ionized. The advantage of a cold atmospheric plasma is that it has room temperature and can be produced at atmospheric pressure on Earth.

In general, a cold atmospheric plasma produces a reactive mix of electrons, ions, excited atoms and molecules, reactive species (such as O3, NO, NO2, etc.), UV radiation and heat, which very effectively destroys bacteria, fungi, viruses, spores or even odour molecules.

Highly efficient against uncontrolled epidemic

Wherever you are, VIROMED helps you to protect yourself against airborne contaminants, with the same abatement efficiency, even in highly critical environments like surgical integration of a bipolar air ioniser in the system, VIROMED not only guarantees a drastic reduction of the contamination risk by airborne contaminants but also cleans the air, removes the unpleasant odours and enriches the ambient air with healthy air ions.

Risk of virus and micro-organism contamination mainly occur in:

- Airports, railway stations
- Showrooms
- Public rooms, like cinemas, concert rooms
- Hotels and seminar rooms
- Airplanes, trains and ferries
Invisibel danger!
They are extremely small and dangerous, we cannot see them, smell them and hear them coming but the day they are identified, it is already too late! Airborne contaminants, like microorganisms, viruses and other disease inducers, are one of the most serious threats for all human beings everywhere in the world. Always newer and more complex airborne contaminants appear, that are often even non identified and resistant to existing antibiotics and vaccines.

Somewhere in the air!
Since the apparition of the first SARS-epidemics, people are now conscious of this invisible danger and this dramatic problem has forced the competent authorities to find an universal solution to fight against virus contamination. Since then, astronomic efforts have been invested to develop new drugs and strategies in order to counteract this lethal danger for at least preventing the uncontrolled and disastrous expansion of new epidemics.

The Solution now exists!
The VIROMED air decontamination system has been especially developed and validated for this purpose. This concept is able to inactivate within a very short time the dangerous airborne viruses, which is a real world "premiere". It can also be used for inactivating other airborne contaminants, like microorganisms and disease inducers. VIROMED is a universal and reliable concept that guarantees extremely high inactivation yields all over the world.

Of this visitor, we need to take care

- Invisibel danger!

- Somewhere in the air!

Virus and micro-organism epidemics are dangerously progressing

- Worldwide expansion
- Contamination also possible via the ambient air
- New, unknown contaminants
- Antibiotic resistant micro-organisms
- SARS/Corona, Ebola, Avian & Human Influenza
Decontamination of indoor air and surfaces

INAKTIVATES viruses, bacteria & germs. Also applies to the CORONA (SARS-CoV-2) virus!

**Step 1: Prefiltration**
A fine filter, installed at the entrance of the system, removes dust particles from the incoming air.

**Step 2: Plasma generator**
Activates the air by corona discharge, cold plasma generates free oxygen radicals which destroy the cell structures of the microorganisms. This destroys or inactivates over 99.97% of all viruses, spores, fungi, pollen and other allergens and odours. This corresponds to a disinfection rate of log4.

**Step 3: Catalytical Oxidation**
Filters the inactivated germs, allergens and fine dust from the air we breathe through electrostatic charging.

**Step 4: UV-C catalysis stage**
Disinfection by combination of a strong UV-C source with titanium dioxide catalyst. In this stage the genetic material of germs is destroyed by intensive UV-C radiation, the titanium dioxide coating catalyzes organic substances, germs, odorous and other volatile pollutants.

**Step 5: Plasma Catalyst Unit**
Catalytic reaction and filtering of the pollutants contained in the air we breathe.

**Step 6: Ionization**
After cleaning the air, natural ions are enriched to give the indoor air the fresh air character of outdoor air. In addition, the viruses, germs, fine dust particles and allergens contained in the (not yet filtered) room air are bound by so-called cluster formation.

With VIROMED there is the possibility to protect oneself and to reduce the risk of infection extremely and to create conditions everywhere, as they are a matter of course e.g. in operating rooms. Inactivates COVID-19, influenza, norovirus, hepatitis, MRSA, streptococci, candida, etc. (have no chance of survival) This way an air disinfection rate of over 99.97 % is achieved. The reduction of pollutants and allergens is over 92% improvement of the indoor air, prevents "Sick Building Syndrome", elimination of VOC` s (volatile organic compounds).

- inactivates viruses, micro-organisms and disease inducers
- Produces healthy and odourless ambient air
- Automatically regulates its intensity according to the airborne contaminant concentration
- Enriches the ambient air with active ions for further degradation of airborne contaminants
- and odours The mobile version allows its use in any place
No chance for infection.

- **Concern for your employees and guests**
  A healthy ambient air is not only crucial on a sanitary point of view but also on an economical point of view. It can improve the performance of your employees and prevent various diseases and demotivation problem due to the so-called “Sick-Building-Syndrom”. An optimal room hygiene is a significant benefit for your establishment. As mobile systems, VIROMED can be installed everywhere. In large establishments, like office buildings, administrative &

- **Concern and investment in the future**
  With the certificate supplied with each VIROMED system, you can show your concern for their well-being.

- **Proven safety**
  CE certified
A continuous air disinfection and enrichment in air ions prevents the spreading of dangerous airborne contaminants and disinfection. Thanks to our collaboration with German universities, we have succeeded in developing a process that can in very short time inactivate airborne micro-organisms and viruses, like SARS, Ebola, human and avian Influenza. This system has been validated in the "Institut für Virologie", Philipps-Universität Marburg (Germany). On of their conclusions is that VIROMED can abate the SARS virus under detectable limits. The VIROMED patented technology can be integrated in existing air conditioning systems and also exists as a mobile and self-contained system that can be installed in any kinds of places.

VIROMED helps you to be on the secure side and to get an optimal ambient air hygiene & quality. VIROMED is the perfect and synergic combination of four successive air treatment steps - Prefiltration, Photochemical disinfection, Catalytical Oxidation and Bipolar Ionisation – also called VIROMED SYSTEM. Thanks to our 30 years experience in the specific field of air treatment.
Latest scientific study of the university of the German Federal Armed Forces of September 2, 2020

Quantification of a Viromed Klinik Akut V 500 Disinfection device to reduce the indirect SARS-CoV-2 risk of infection from aerosol particles

Prof. Dr. Christian J. Kähler, Dr.-Ing. Thomas Fuchs, Dr.-Ing. Rainer Hain
University of the German Federal Armed Forces Munich
Institute for Fluid Mechanics and Aerodynamics

Overview:
The question therefore arises as to how people in closed rooms can be permanently protected from SARSCoV-2 infection. Large safety distances offer external and internal protection, but they do not protect against indirect infection when the viral load in the room is high. Mouth and nose covers only offer external protection against direct infection, but they do not protect against indirect infection. The same applies to face shields and small protective walls. Indirect infections can be effectively prevented by ventilating freely with windows or ventilation systems (RLT) systems that direct 100% outside air into the room, provided the air exchange rate is six times the room volume per hour. However, free ventilation using windows is rarely efficient enough, and in winter at the latest it is no longer possible to open windows without wasting massive amounts of energy and endangering people’s health and well-being.

Another technology that can be used to fight viruses is based on the ionization of the air and aerosol particles. When it comes into contact with the virus, the electrically charged air can inactivate them directly and thus destroy their ability to trigger an infection. The harmful effects of ionized air on viruses and other pathogens are used in clinics, for example to accelerate the healing of chronic wounds. As part of this study, the Viromed Klinik Akut V 500 disinfection device is analyzed, which uses all three physical mechanisms to combat viruses and germs in the room air at the same time. Due to the complexity of the flow problem, an experimental approach is used for the analysis, since only in this way can the many influencing factors be physically correctly recorded and evaluated.

Zusammenfassung und Schlussfolgerung
For rooms with 80 m² and the operation of two Viromed Klinik Akut V 500 disinfection devices halving the aerosol particle concentration in approx. 11 minutes. The air change rate is therefore slightly lower than 4 per hour and thus below the value we recommend of 6 room air changes per hour. Since the device has an ionization unit in addition to filtering the aerosol particles, the power of which can be freely set on the device, additional protection against SARS-CoV-2 infection should be implemented by ionizing the room air in this room size.

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Disinfection devices are used to filter all areas quickly. Due to the danger of the SARS-CoV-2 infection, the air exchange rate provided by the devices should not fall below a value of 6 air changes per hour, unless additional protective devices can be used in addition (ionization of the room air, UV-C, RLT systems, free ventilation). Air exchange rates of 6 per hour represent a good compromise between technical feasibility and safety from an indirect infection.

When purchasing disinfection devices or room air purifiers, it is very important that the devices also have reliable facilities for separating and inactivating viruses. Inexpensive devices usually neither have sufficiently large volume flows (6 times the room volume per hour!) Nor efficient filters of class H13 / H14 or comparable, which provide the required degree of separation for the large volume flows, or powerful ionization or UV C units.
## Technical specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Dimensions L x B x H [mm]</th>
<th>Power Consumption [W]</th>
<th>Max. room size [m²]</th>
<th>Air flow strom [m³/h]</th>
<th>Voltage [V]</th>
<th>Weight [kg]</th>
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<tbody>
<tr>
<td>KLINIK AKUT V 500</td>
<td>700 x 298 x 755</td>
<td>160</td>
<td>appr. 60</td>
<td>330</td>
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<td>KLINIK AKUT V 500 +</td>
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<td>45</td>
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<tr>
<td>KLINIK AKUT V 1000 Plasma</td>
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<td>300</td>
<td>appr. 120</td>
<td>230</td>
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<td>42</td>
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</tbody>
</table>

### Safely inactivates viruses

- The food industry Hotels and Restaurants
- The catering industry & kitchens
- Offices and administration buildings
- Hospitals and medical laboratories
- People retirement homes and nursing
- houses Private homes
- Animal breeding farms
- Any other sectors releasing odorous emissions

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