

Airborne Particle Cleaning: Compact On-Site Applicable Metisafe Solutions From a Home-Office Environment to Cleanroom

Whether it is a shopping centre, hospital or official institution buildings, all of them are designed according to the relevant legislation for comfort purposes. In traditional ventilation systems, high-efficiency air filtration is not applied except in special critical areas such as operating rooms. A reality that emerges in the case of communicable diseases that threaten society such as the Covid-19 pandemic is that the mechanical infrastructures and ventilation of the buildings are not suitable for preventing airborne contamination.

Since traditional building mechanical ventilation systems are operated centrally, they are generally not suitable for independent filtration and pressurization of indoor spaces. Initiatives that try to make modifications to increase air biosafety over the central HVAC system often fail to achieve the expected performance or costly time-consuming solutions emerge.

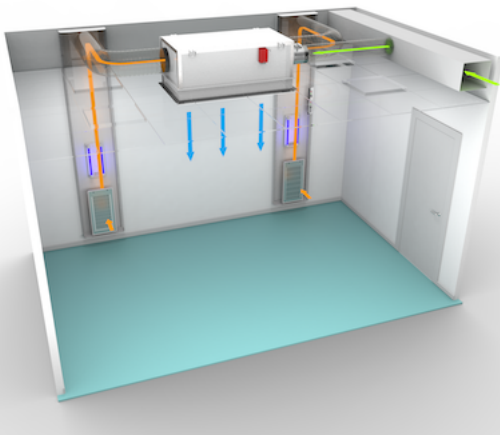
Metisafe applies the unique modular cleanroom concept that works like a device together with its advanced area of expertise in air biosafety in its performance-oriented system designs. Metisafe, which has over twenty years of design, production and field experience, has renewed its high-performance cleanroom equipment by converting them into the kit format. In this way, it offers practical solutions that can be integrated into the ventilation system without interfering with the building infrastructure and provide interior air barriers or isolations.

One of these solutions is Metisafe's portable air purification products, pro series AC-1500, AC-1000, AC-300 and i-biosafe series AC-750, AC-500 and AC-250 model HEPA filtration devices. Pressurizing the environment (positive or negative) according to the need is one of the most important features required to ensure air safety. One of the most distinctive feature of Metisafe portable air purifiers compared to other portable products in the market is that also performing the indoor pressurization on the same device.

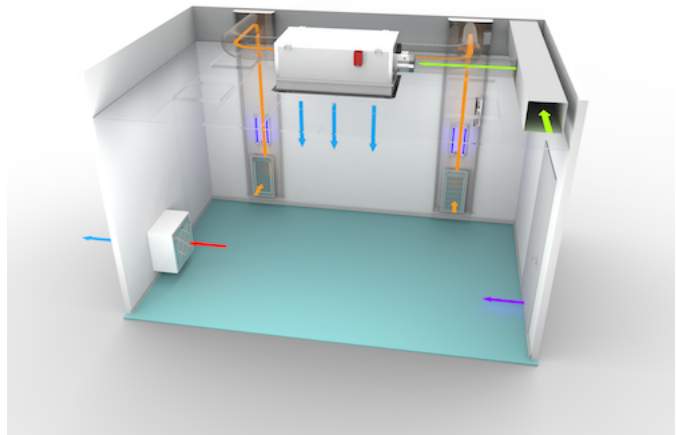
The other solution is ceiling type recirculation fan filter systems, which can be defined as fixed air cleaning system. In this application, Metisafe uses the methods applied in its unique concept modular cleanroom products. In this way, standardized particle filtration is achieved by using closed system cleanroom equipment without installation of additional carrier and ceiling panels on site. The HEPA filtered airflow moving from the ceiling to the floor up to the limited room height is considered to be the most ideal particle sweeping technique. Thanks to the air intake ducts located close to the floor of the room, the clean air directed towards the floor take the dirty air in the system through the suction ducts and is recirculated inside the room by passing through the HEPA filter on the ceiling (Figure 1.).

Figure 1 .: Airflow diagrams of Metisafe recirculating FFU system in connection with central ventilation ducts

Positive Room Pressurization



Negative Room Pressurization



- Fresh air intake taken through central ventilation duct
- Room air / Recirculated air
- HEPA filtered air supply from FFU unit

- HEPA Filtered Air (Indoor and Exhaust Air)
- Indoor air directed to the exhaust unit

With this airflow technique, it is possible to achieve a high cleanroom class particle cleaning performance by using the appropriate number of fan filter units (FFU) and suction ducts, even when the advanced analysis is made without creating dead spots and air vortexes.

Room pressurization through Metisafe ceiling-mounted FFU systems is possible with very low air exchange. The amount of fresh air required or exhaust air can be easily adjusted according to the sealing levels in the room. Along with these, it can be programmed automatically through the automation control panel if desired. Air exchange with the external environment, outside the building or through corridors, as well as the ability to connect to central ventilation systems, provides the applicability of Metisafe ceiling type recirculating FFU systems to all kinds of building mechanics. Due to its high air recirculation and the ability to use conditioned air, ambient comfort can also be provided.

Metisafe ceiling type recirculated FFU systems can be applied at minimum 280 cm room heights. It consists of 3 model equipment sets and 3 different pressurization kits classified according to the HEPA filtered air rate capacity (Figure 2.). Metisafe FFU systems have the ability to be used in spaces of all sizes by increasing the number of equipment, for those who seek more efficient solutions than traditional and portable systems without getting into reconstruction complexities in their existing buildings (Figure 3.). Metisafe FFU systems provide a significant advantage and convenience compared to central systems, thanks to the ability to control the equipment individually or multiply and to be adjusted according to varying needs.

Figure 2. Main cleanroom equipment contents of Metisafe recirculated FFU system

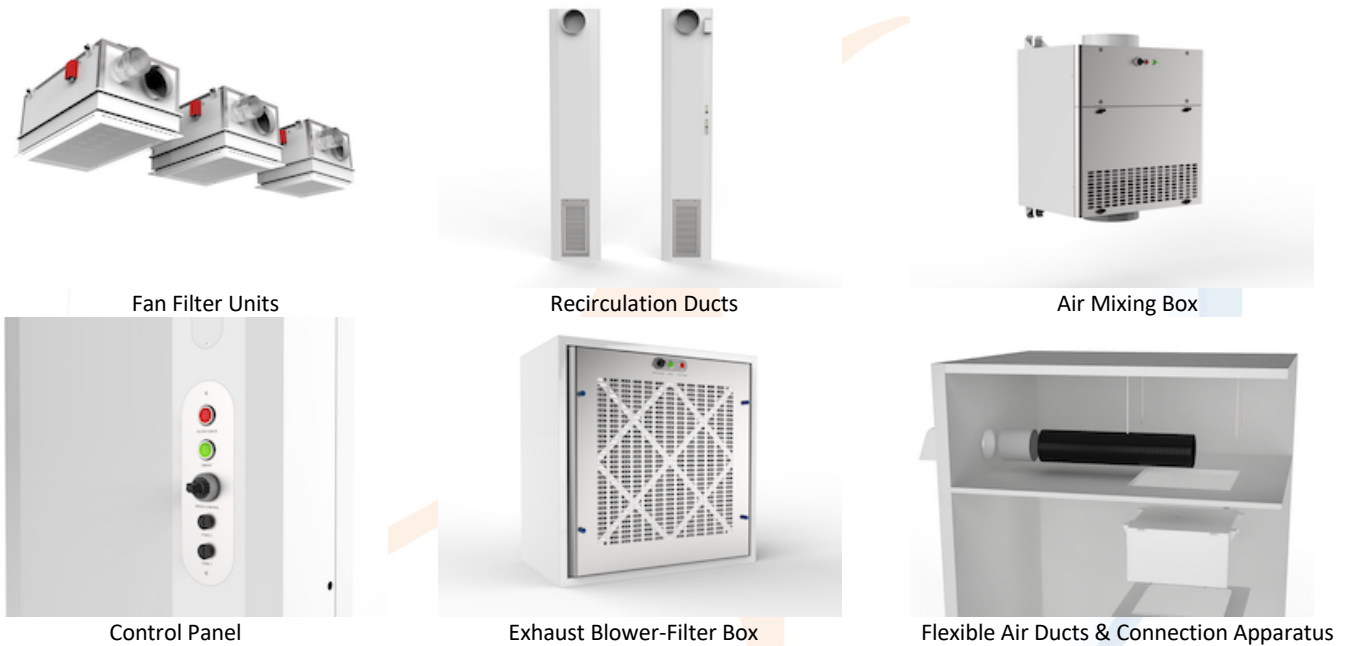


Figure 3. Assembly sketches of Metisafe recirculated FFU system

