
PURE INNOVATION IS IN THE
AIR

BUILDINGS
USE A LOT OF ENERGY.
THIS LITTLE APPLIANCE
REDUCES IT.
YOU SAVE MONEY.
YOU SAVE POLLUTION.

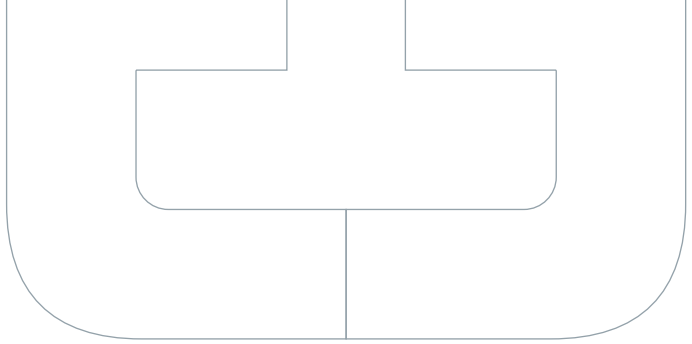
YOU ADD VALUE TO YOUR BUILDINGS. ALL-IN-ONE.

BUILDINGS ARE ENERGY EATERS.

The role of energy codes.

Buildings have an impact on people's lives, economic well being and the United States' dependence on foreign oil, national security and the health of the planet. According to the U.S. Department of Energy, buildings use 39% of our total energy, 74% of our electricity and one-eighth of our water. Energy codes and standards set minimum requirements for energy-efficient design and construction for new and renovated buildings that impact energy use and emissions for the life of the building. Improving the energy code generates energy savings in a consistent and long lasting manner. Buildings last a long time and an energy efficient building has the potential to save energy throughout the life span of the building. The benefits of more efficient construction today are enjoyed for 30-50 years. Energy-efficient buildings offer both tangible and intangible energy, economic, and environmental benefits. They are more comfortable and cost effective to operate.

Research shows that contemporary energy codes could save about 330 Trillion BTU - British Termal Unit - by 2030, almost 2% of total current residential energy consumption. There would also be comparable savings in consumer energy bills, air pollution and greenhouse gas emissions.



ENERGY RECOVERY VENTILATION.

One approach to building energy efficiency has involved limiting the amount of outside air that enters the building. However, according to some studies, ventilation rates of about 20 cubic feet per minute (cfm) per person are generally the best way to keep a building healthy and occupants comfortable. Rates below 15 cfm are thought to be problematic. Studies and experience have demonstrated that conventional packaged HVAC equipment cannot achieve comfort conditions at these higher rates of ventilation in hot and humid climates. The federal government has announced the goal of reducing building energy use by 50% by the year 2010 while increasing productivity and comfort by 30% and reducing occupant illness by 50%. For this reason, a technology had to be developed that could successfully meet these goals and energy recovery ventilation is this technology.

For large buildings, energy recovery ventilation is being promoted as a technology that has the ability to ventilate buildings at twice the rate for half the cost, which should go a long way to solving many Indoor Air Quality (IAQ) problems.

Energy recovery ventilation systems are mechanical ventilation systems that use fans to maintain a low-velocity flow of fresh outdoor air into a building while exhausting an equal amount of stale indoor air. Fresh air is supplied to all levels of the building, while stale air is removed from areas with high levels of pollutants and moisture.

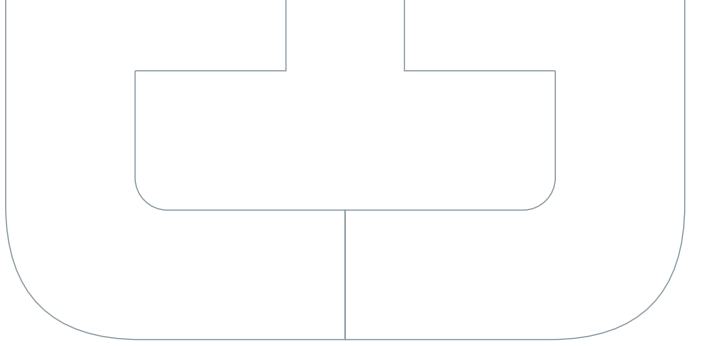
Energy recovery ventilation is the best method for this type of improvement because of its ability to precondition outdoor ventilation air while improving humidity control, which allows conventional cooling equipment to maintain acceptable indoor relative humidity conditions in high occupancy buildings. It also reduces the size of the heating and cooling plant through reduced design load, and, it is proven to reduce operating energy and cost.

WHEN YOU SPEND 54 MINUTES AN HOUR INDOORS, SHOULDN'T YOU CARE ABOUT INDOOR AIR QUALITY?

LESSON NUMBER ONE - DURATION: 6 MINUTES

HOW TO MAKE YOUR HOME PURE.

WHEN YOU SPEND 54 MINUTES AN HOUR INDOORS, SHOULDN'T YOU CARE ABOUT INDOOR AIR QUALITY?



In the last several years, a growing body of scientific evidence has indicated that the air within houses and other buildings can be more seriously polluted than the outdoor air in even the largest and most industrialized cities. People spend approximately 90 percent of their time indoors: the risks to health may be greater due to exposure to air pollution indoors than outdoors. Young people, the elderly and the chronically ill, especially those suffering from respiratory or cardiovascular disease, are under attack. Most houses have more than one source that contributes to indoor air pollution: from combustion sources - oil, gas, kerosene, coal and wood - to building materials and furnishings as diverse as deteriorated, asbestos-containing insulation, wet or damp carpet and cabinetry or furniture made of certain pressed wood products. In addition, products for household cleaning, personal care or hobbies, central heating, cooling systems and humidification devices. Finally, outdoor sources such as radon, pesticides and outdoor air pollution.

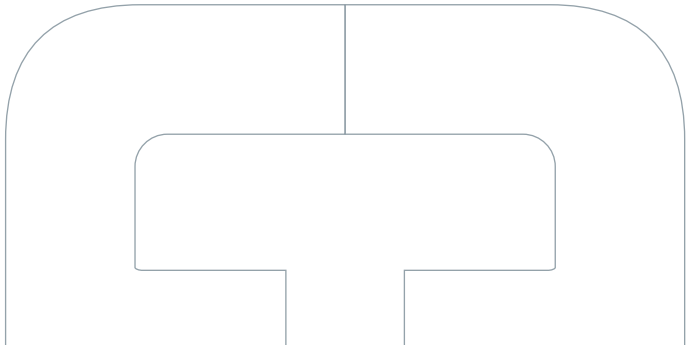
A LETTER FROM A HERMETIC HOME.

If too little outdoor air enters a home, pollutants can accumulate to levels that can pose health and comfort problems. Homes designed and constructed to minimize the amount of incoming outdoor air that can be pushed into and out of the home may have higher pollutant levels than other homes. When there is little infiltration, natural ventilation or mechanical ventilation, the air exchange rate is low and pollutant levels can increase.

IAQ-INDOOR AIR QUALITY.
THE EMERGING ISSUE.

COMMON CONTAMINANTS

- CARBON MONOXIDE
- NITROGEN DIOXIDE
- COMBUSTION PRODUCTS
- OZONE
- FORMALDEHYDE
- PARTICULATES
- RADON
- ASBESTOS
- VOLATILE ORGANIC COMPOUNDS
- ENVIRONMENTAL TOBACCO SMOKE



Indoor Air Quality is an emerging indoor environmental issue that can affect any occupied indoor space. Two of the most common illnesses associated with poor Indoor Air Quality include Sick Building Syndrome (SBS) and Building Related Illness (BRI). According to the Environmental Protection Agency (EPA), indoor levels of air pollutants can be two to five times higher and occasionally 100 times higher than outdoor levels. The EPA consistently ranks indoor air pollution among the top five environmental risks to public health. Approximately 9 million children under 18 in the U.S. have been diagnosed at some time in their lives as having asthma. Overall, more than 34 million Americans have been diagnosed as having asthma. The United Nations attributes 1.6 million deaths per year to diseases caused by indoor air pollution. Nearly 60% of those who die are children. The economic cost of these problems is correspondingly high. More recent statistics from the American Academy of Allergy Asthma and Immunology place the annual economic cost to the U.S. of asthma alone at $19.7 billion.

PERCENTAGES OF IAQ PROBLEMS - The National Institute for Occupational Safety and Health

Problem	Percent
Inadequate ventilation	52
Contamination from inside the building	16
Contamination brought inside the building	10
Microbiological contaminants	5
Building material contamination	3
No known cause	14
Total	100

IN DETAIL: MOLD, 9/11 AND BIOTERRORISM.

Molds can grow on virtually any substance as long as moisture or water, oxygen, and an organic food source are present. Mold spores are a constant in indoor and outdoor air. They can cause adverse effects by producing allergens. Allergic responses include hay fever-type symptoms such as runny nose and red eyes.

Molds may also cause localized skin or mucosal infections and can cause asthma attacks in some individuals who are allergic to mold. In addition, exposure to mold can irritate the eyes, skin, nose, and throat in certain people. Bioterrorism issues have also commanded increased public attention since 9/11 and the accompanying anthrax scare.

IAQ-RELATED ILLNESSES REQUIRING MEDICAL ATTENTION

Headaches	57.0 in 1,000
Respiratory ailments	85.0 in 1,000
Death	1.6 million
Source: OSHA	

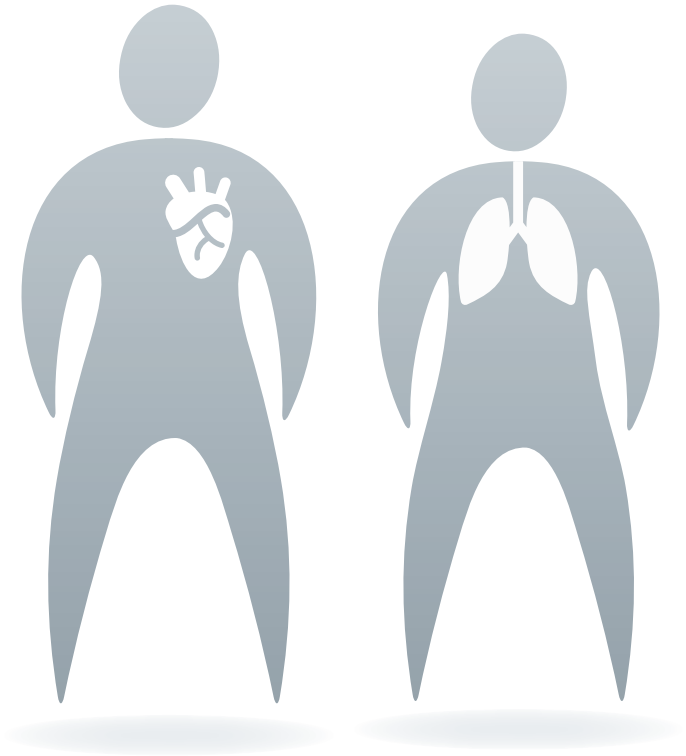
IN DETAIL: RADON.

As uranium, contained in the soil or rock on which houses are built, naturally breaks down, it releases radon gas which is a colorless, odorless, radioactive gas. Radon gas enters houses through dirt floors, cracks in concrete walls and floors, floor drains and sumps. When radon becomes trapped in buildings and concentrations build up indoors, exposure to radon becomes a concern. Any home may have a radon problem: new and old houses, well-sealed and drafty houses, houses with or without basements. You can't see, smell, or taste radon, but it could be present at a dangerous level in your home: it is the leading cause of lung cancer deaths among nonsmokers in America and claims the lives of about 20,000 Americans each year. In fact, the EPA and the U.S. Surgeon General urge all Americans to protect their health by testing their houses, schools, and other buildings for radon.

TABLE OF IAQ RELATED COSTS TO THE U.S. ECONOMY [$ BILLIONS]

Increased respiratory disease	6 to 19
Increased allergies and asthma	1 to 4
Sick building syndrome	5 to 10
Reduced productivity	12 to 125
Total cost	24 to 158

Source: U.S. Department of Energy and the Lawrence Berkley National Laboratory



HEALTH EFFECTS FROM INDOOR AIR POLLUTANTS.

They may be experienced soon after exposure or, possibly, years later. Immediate effects may show up after a single exposure or repeated exposures: irritation of the eyes, nose and throat, headaches, dizziness and fatigue.

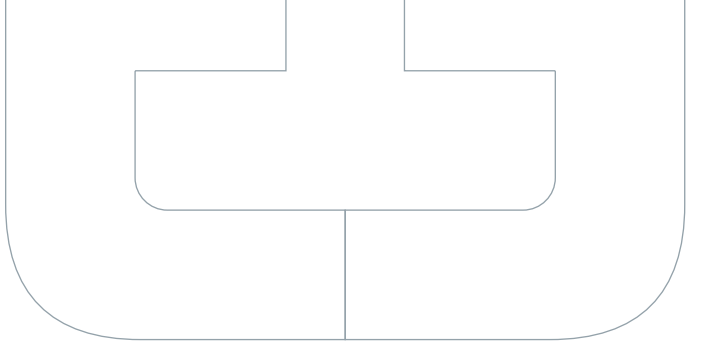
Symptoms of some diseases, including asthma, hypersensitivity pneumonitis, and humidifier fever, may also show up soon after exposure to some indoor air pollutants. The likelihood of immediate reactions to indoor air pollutants depends on several factors. Age and pre-existing medical conditions are two important influences. In other cases it only depends on individual sensitivity.

Some people can become sensitized to biological pollutants after repeated exposures, and it appears that some people can become sensitized to chemical pollutants as well.

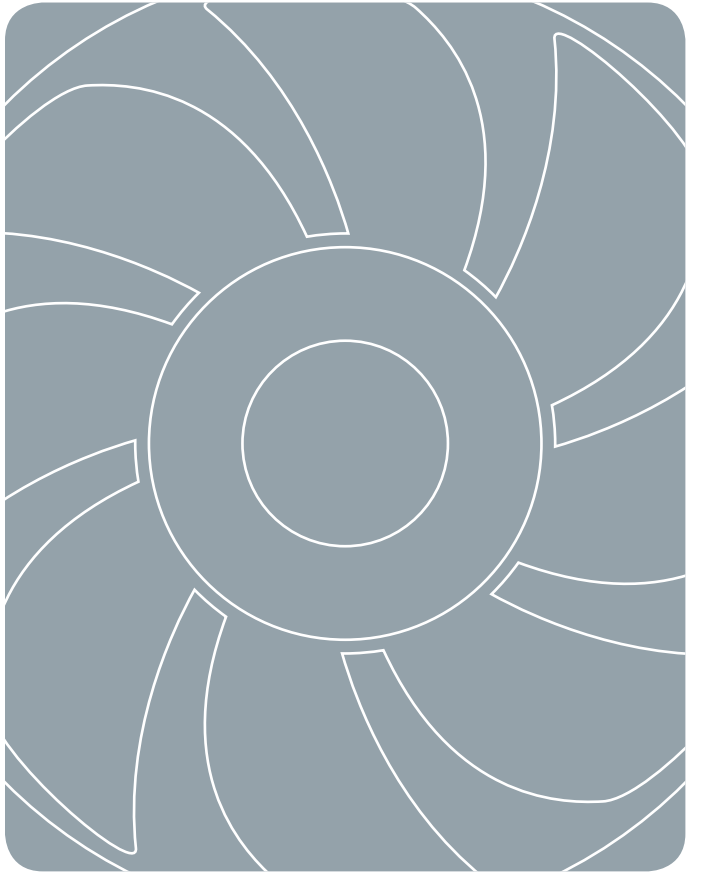
Other health effects may show up either years after exposure has occurred or only after long or repeated periods of exposure.

These effects, which include some respiratory diseases, heart disease and cancer, can be severely debilitating or fatal.

AIRCHANGER. A HEAT RECOVERY VENTILATION TECHNOLOGY.

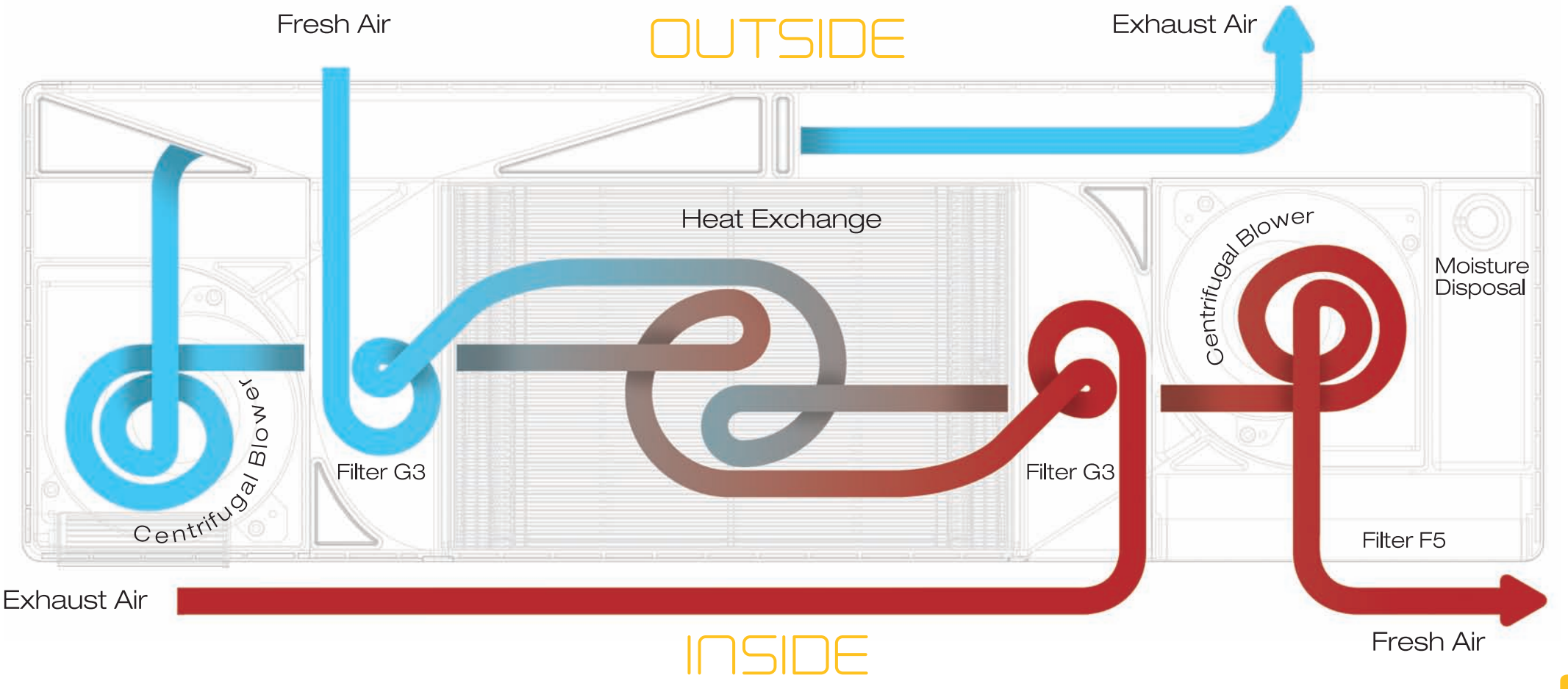


AirChanger is a heat recovery ventilator (HRV) which provides an energy-efficient way to bring in fresh filtered air while removing stale air. This system bring in fresh air from the outside, pre-heat it in the winter and pre-cool it in summer. This technology is healthy as having the ability to provide clean air every day while helping to keep energy costs low. The heart of this air-to-air HRV system is the heat recovery ventilation unit, which houses the heat exchange core. One duct collects stale, moist air from the building, which then passes through the heat exchange core and is exhausted to the outside. The other duct draws fresh, clean air from the outdoor through the HRV unit. As the two air streams pass each other within the heat exchanger core, heat is transferred from the outgoing stale air to the fresh incoming air. There is no mixing of air streams. The beauty of this HRV system is that it is able to capture up to 85% of the energy from the outgoing stale air with a very low electricity consumption which is not over 15W/h (24V) per unit. Filtered, pre-conditioned fresh air is then delivered in an efficient manner to the occupied areas of a building.



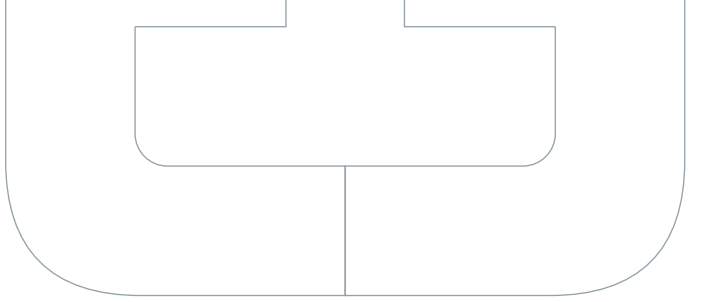
COLD WEATHER CONFIGURATION.

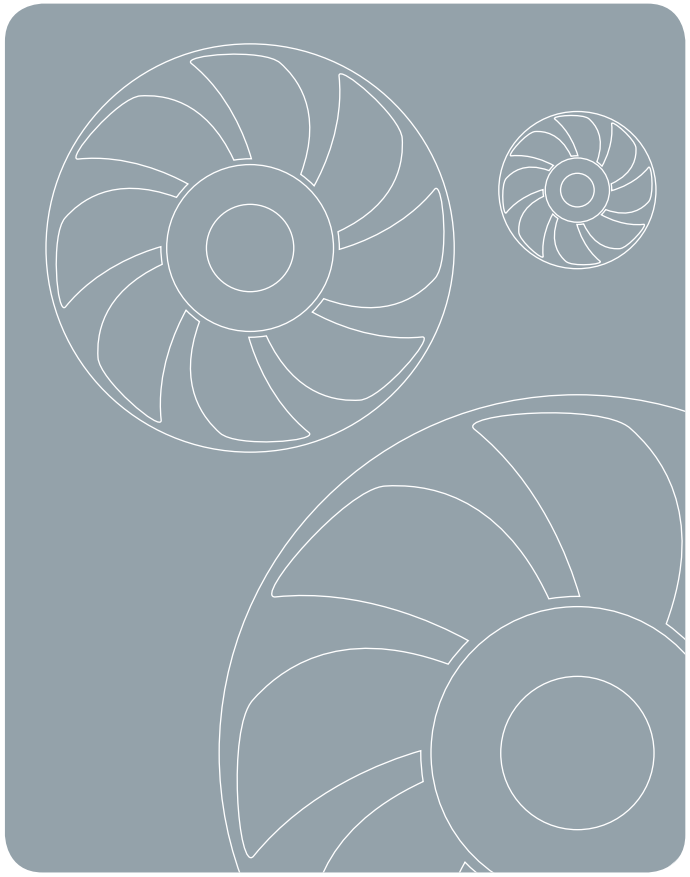
For HOT WEATHER CONFIGURATION the airflows temperatures colors are inverted.

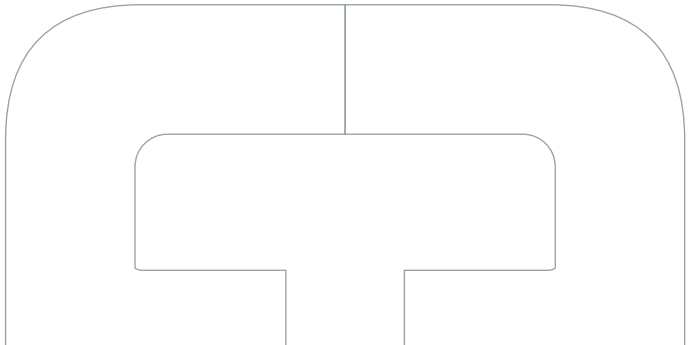


AT HOME IN ALL ENVIRONMENTS.

AirChanger is the high-tech single room heat recovery ventilator (HRV) unit that has been designed specifically for environments where there is a considerable need for air renewal: schools, hospitals, offices, laboratories, houses and apartments. When equipped with electronics (on request) it ensures maximum integration with building automation systems and is extremely versatile both in new or refurbished (even partially) buildings.



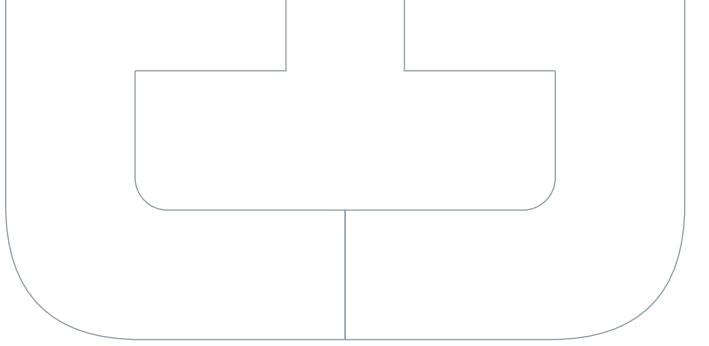




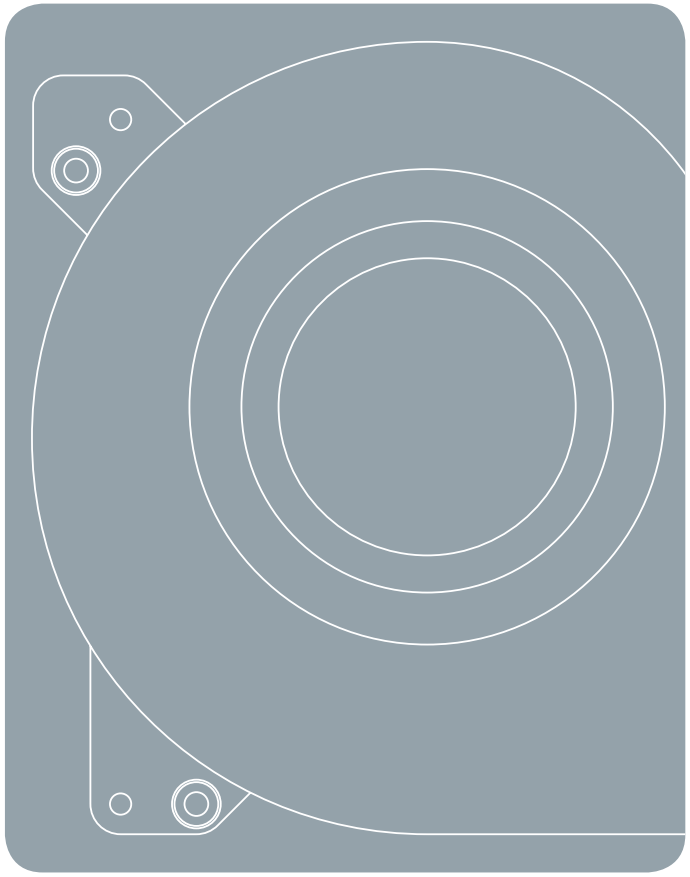
CONFIGURATIONS AND APPLICATIONS.

AirChanger is available in various configurations and offers designers and constructors an innovative solution for both air-conditioning and air-renewal requirements.
The dimensions are length 37.4”, height 3.93” and a maximum depth of 11.81”.
Units are installed within perimeter walls and reflect Italian attention for design by minimizing the aesthetic impact, given that only two low-profile slits are visible from outside. Seen from inside the casing projects slightly out from the wall to ensure air circulation, however, the surface can be painted of covered in the same way as the surrounding wall. AirChanger can be installed under windows, either level with or under the lower surface of the window ledge, above the window in the roller-blind housing, or even vertically, alongside the window.
Power requirements depend on the flow specified for air renewal and will, in any event, always comply with energy class regulations.
Each unit operates independently and can be turned on or off individually by the remote control, leaving the user free at all times to decide how many units need to be in operation.
An indicator will advise the user when the air filters need to be replaced.
A centralized monitoring and remote control system governing all units can be installed in buildings such as hotels and hospitals.

CLEAN AIR IN YOUR HOME AND AT WORK.

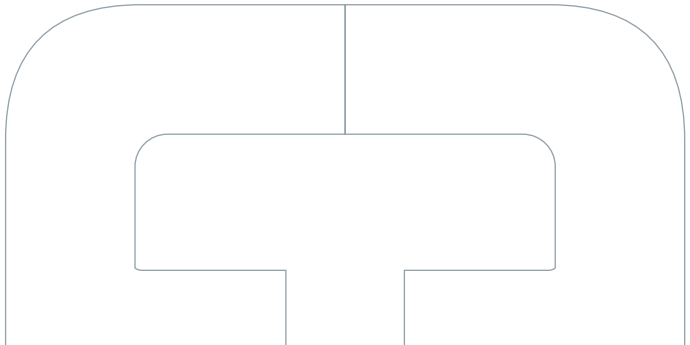


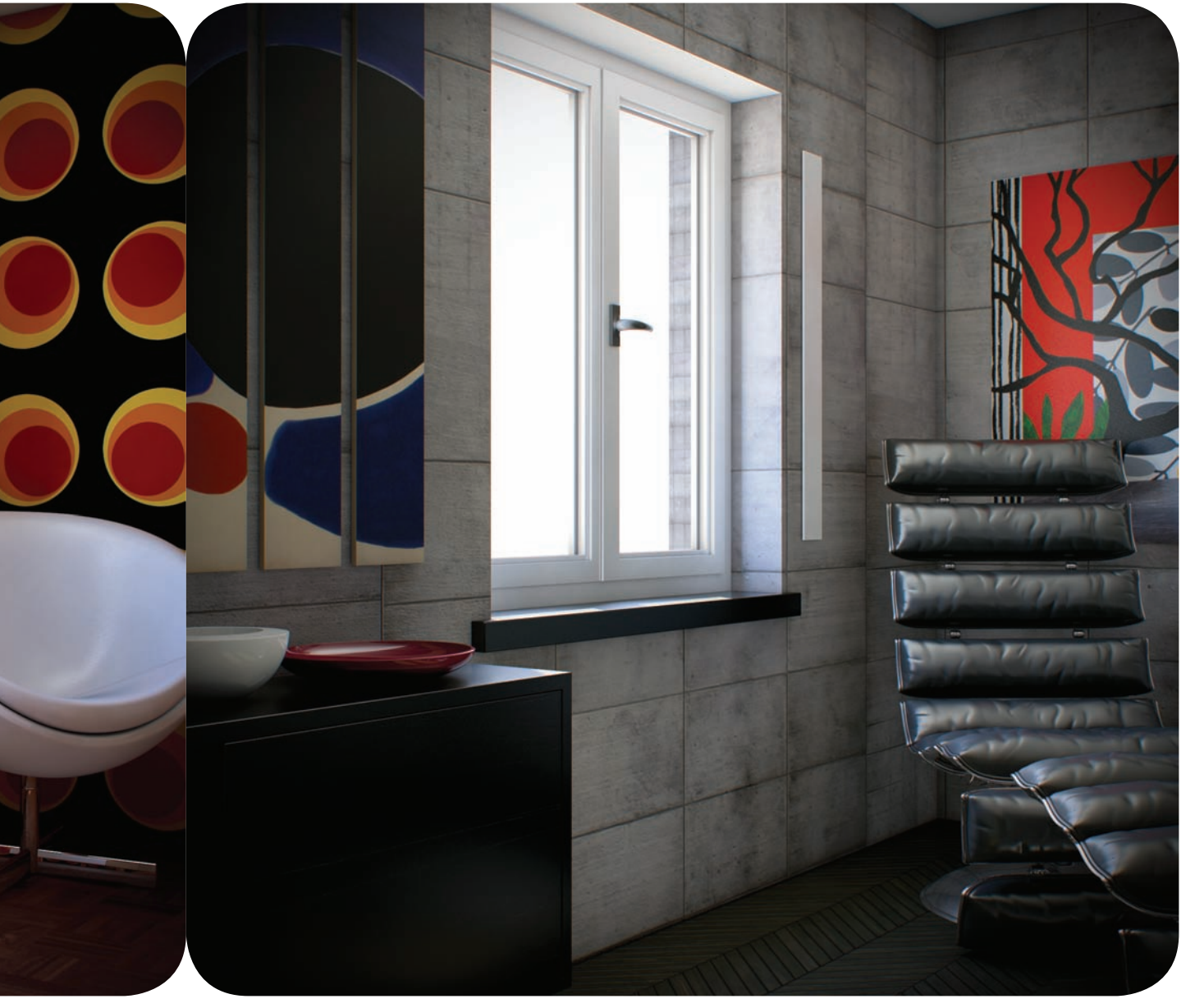
Thesan has focused much attention on the air purification system, which uses G and F-class filters in the standard configuration. Ionizers and special anti-bacterial UV filters utilizing energy saving LED technology can be installed on request and are particularly suitable for applications in environments requiring controlled antiseptic conditions, such as hospitals, nurseries or research laboratories in the chemical and biological fields.



OTHER FEATURES.

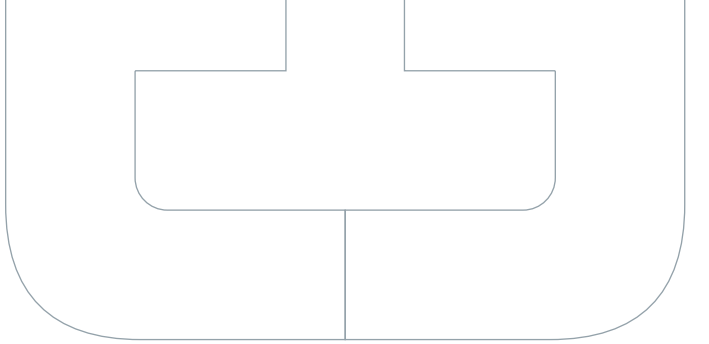
A mechanical bypass device can be included to exclude the exchanger in certain weather conditions, although filtering will always continue to function. In compliance with American regulations, AirChanger not only features extremely silent operation, making considerably less noise than normal air-conditioners, it also offers protection against transmission of external noise. And, furthermore, there is no need to leave doors and windows open for air renewal. Thanks to this virtually noiseless mode of operation it is suitable for night-time use in bedrooms. Of course, if necessary users can adjust the air flow with the system's remote control unit.





CAN YOU SEE IT?

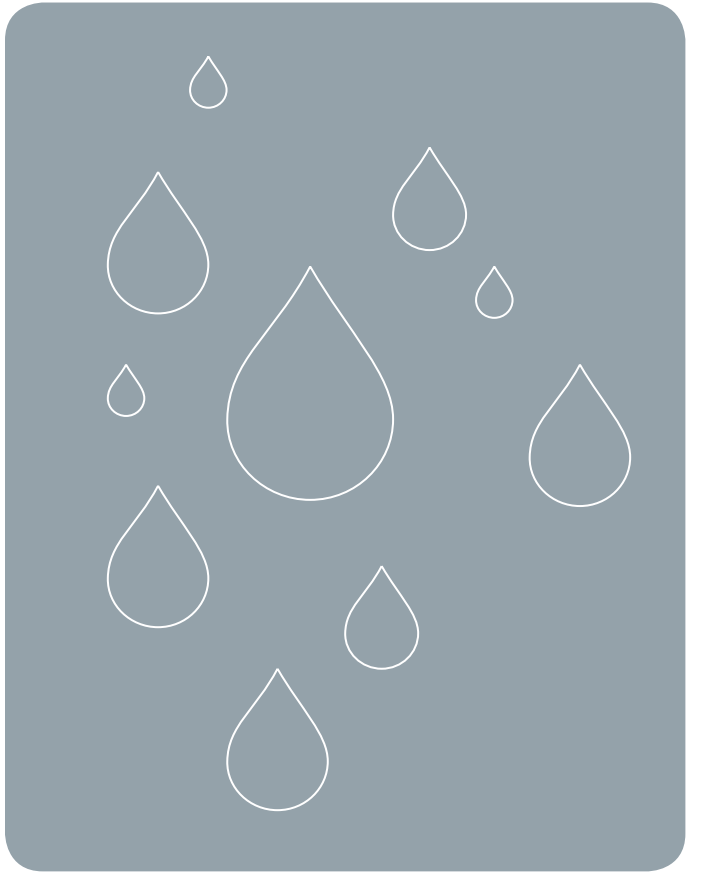
SOLUTIONS FOR DRAINING OFF CONDENSATION.



The problem of condensation is crucial, especially in hot-humid climates where it can easily reach dew-point.

So condensation can be discharged in one of two ways:

- a centralized mode, in which condensation is channeled through a siphoned drainage tube to the residence's central drainage conduit;
- alternatively condensation can be vaporized by means of a system comprising a pump and nozzle located on the air-discharge tube, which sprays the condensation out through the external slits.



SUMMARY

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between

AirChanger

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