

Integrating an Advanced Ventilation with Automation

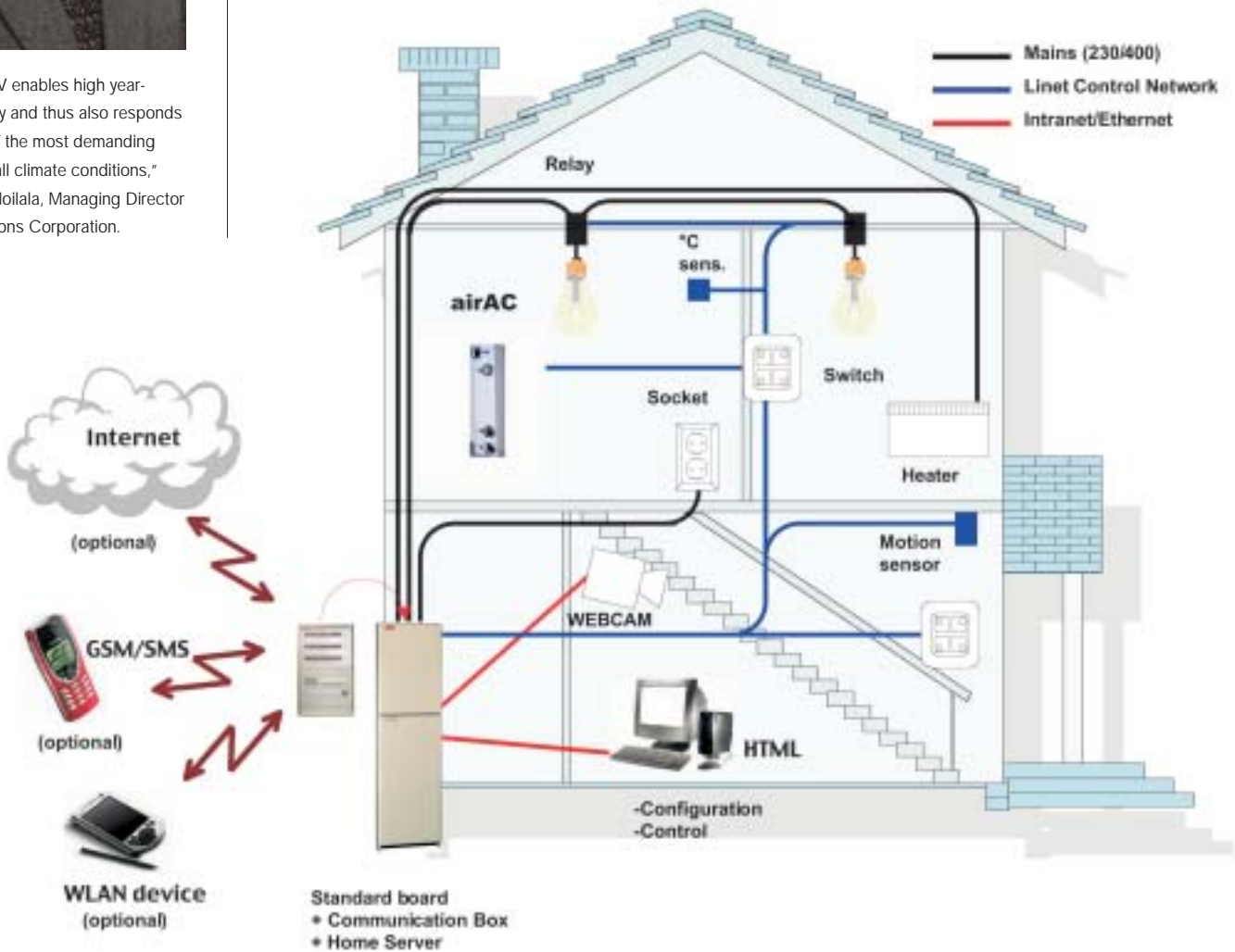
COMFORTABLE INDOOR AIR WITH LOW HOUSING COSTS



"The airAC ERV enables high year-round efficiency and thus also responds to the needs of the most demanding residents – in all climate conditions," says Mr. Kari Moilala, Managing Director of MG Innovations Corporation.

FOR BUILDINGS, VENTILATION WITH HEAT RECOVERY IS THE LEAST EXPENSIVE AND MOST ENERGY EFFICIENT WAY TO HEAT, COOL AND BALANCE INTERNAL HUMIDITY FOR INCREASED COMFORT. THIS IS PROVEN BY A REGENERATIVE AIRAC ERV (ENTHALPY RECOVERY VENTILATOR) AND A REVOLUTIONARY HOME AUTOMATION SYSTEM, APTUS, DEVELOPED BY FINNISH COMPANIES. THE AIRAC ERV ABOUT HALVES THE ENERGY CONSUMPTION OF VENTILATION, AND THE APTUS CONTROL SYSTEM INTEGRATED WITH AIRAC ERV FURTHER REDUCES ENERGY COSTS AROUND 15%.

System layout



Heating and cooling a home uses more energy and drains more energy money than any other system in the home, typically about 50%. Ventilation heat loss is the most im-

portant reason for high heating and cooling costs. Globally, air conditioning is the single leading cause of demand for electricity causing power cuts. The importance of air conditioning is increasing due to the

effects of global warming, which enhances humidity problems as well.

The Seasonal Performance Factor (SPF) of a conventional Heat Recovery Ventilator (HRV) is relatively low, typi-

Unique Home Automation

A network of Finnish companies has developed a revolutionary system, APTUS, which begins a new era in home automation and reduces housing costs 15–30 %.

The system includes:

- Intelligent lighting controls which make it easy to modify lighting as the use or furniture of a room changes.
- Out of building automation. When leaving the building, with a single push of a button the user can turn off the lighting, stove, water supply, desired wall sockets etc. This increases the lifetime of lamps and reduces unnecessary use of power, while eliminating the possibility of water damage.
- Remote control in addition to local control, electrical devices such as locks, lighting and wall sockets can be controlled remotely over the Internet with a remote control or a GSM phone.
- Heating control system, which saves energy by allowing individual control for each room of the building.
- A browser user interface for the system which collects different technologies and user panels behind a single, easy-to-use interface. Direct connection to the Internet is optional, as the system may also be connected with a local PC or other device running browser software.

REAL PRODUCTS FOR EVERY HOMEBUILDER

The APTUS is a tangible product and ready for delivery. The system truly improves the comfort and safety of living, while lowering the energy consumption of the building.

- The attractive pricing of the system ensures that every homebuilder can afford it," says **Mr. Markku Peittola**, Managing Director of Oy Aptus Sensible Electronics Ltd, the company (www.aptus-se.com) responsible for developing the home automation system.

Among the other companies involved in the development of the system was ABB, LV System (www.abb.fi) which develops and manufactures the intelligent switch board.

MG Innovations Corporation (www.airac.net) developed and patented the optional ventilation and regenerative heat recovery equipment of the system. The company offers special units for cooling and dehumidification.



Regenerative AirAC ERV ventilator.

cally 0–20 %. The reason for this is moisture. The vapor from the exhaust of an HVR can freeze the core and the exhaust vent to the outside, thus reducing the ventilation rate. HRVs are also known for drying house air to uncomfortable levels in cool climates. Heating the core is not an option, as it would further reduce efficiency.

In the airAC ERV solution, developed and double-patented by MG Innovations

Corporation, a certain amount of water vapor is transferred along with the heat energy. Whereas in a conventional HRV only heat is transferred.

"By taking advantage of sensible and latent heating, the airAC ERV enables unforeseen high year-round efficiency and thus responds to the needs of even the most demanding residents," says Mr. Kari Moilala, Managing Director of MG Innovations Corporation.

OPERATES YEAR-ROUND WITH A SHORT PAYBACK PERIOD

The very same airAC ERV unit can be used optimally in summer as well as in winter, in warm, cold and humid climates.

"The unit has automatic functions which are not available conventionally, even as accessory devices. Therefore, low initial costs combined with low running costs enable a foreseeable short payback period of two to three years," Moilala states.

In winter, the system transfers some of the moisture from the exhaust air to the usually less humid incoming cold air, thus maintaining the quality of house air more constant. This also keeps the heat exchanger core warmer and eliminates problems with freezing.

In summer, the airAC ERV automatically controls the humidity in the house by transferring some of the water vapor in the incoming air to the typically drier

air that is leaving the house. This natural function makes it possible to keep the operating temperatures of airAC units as close as possible to the indoor set point temperature. Because the core is alternately warm and cool, dry and damp, it exceptionally enables energy-efficient evaporative cooling also in humid climates. A conventional HRV brings in summer humidity with outside air, making the indoor air too humid.

INNOVATIONS FOR THE FUTURE

The airAC ERV unit can be integrated into compressor cooling units or compressorless active solar cooling units.

"Currently, we are developing a combination of airAC ERV thermoelectric cooling units based on semiconductors and absorption cooling, enabling compressorless cooling and drying by any solar and waste heat energy," Moilala describes.

Internal air drying requires a lot of energy. For dehumidification by outdoor air, MG Innovations has designed a unit which is a combination of regenerative and recuperative heat exchangers.

The unit remarkably reduces energy costs used for dehumidification in indoor swimming pools, laundries and other similar environments.

MG Innovations Corporation has put forward several patent applications regarding these innovations •