TYPICAL APPLICATIONS

Many applications can benefit from the EnergyX® system. The following applications exhibit conditions in which the EnergyX system would be an ideal cost-effective enhancement to a conventional packaged rooftop unit application.

Retrofit/Replacement

As a factory installed, packaged unit that uses the same roofcurb as the standard base rooftop unit, the EnergyX system is an ideal candidate for replacement and/or retrofit applications.

Schools

Due to variable student occupancy with constant changes in ventilation air change requirements in each classroom, the proportion of latent load may be high, and humidity may rise. Controlling the indoor humidity while also meeting the high ventilation rates can cause significant unit operational problems, which can easily be addressed using the EnergyX system.

Retail

The high ventilation rates, long hours of occupied operation, and focus on reducing operating costs make the EnergyX system an ideal candidate for retail stores.

Restaurants and Fast Food Chains

The high degree of variable occupancy and high ventilation rates, along with kitchen areas of restaurants that have many humidity producing activities, such as dish washing and cooking, can easily result in humidity control problems and over cooling by conventional packaged rooftop units.

Offices

High ventilation rates with variable ambient loads can cause inefficient operation of a large conventional constant volume rooftop system. The EnergyX system is an ideal alternate to more costly variable volume systems.

Churches

Like schools, the high degree of variable occupancy and ventilation requirements can result in humidity control problems and over cooling situations by a conventional packaged rooftop unit. The EnergyX system provides a method to address both concerns in a cost effective package.

EnergyX® Benefits at a Glance

For Building Owners and Managers

- High system efficiencies
- Advanced occupant comfort
- Expanded rooftop unit ambient operating range
- Real time ventilation air/exhaust air CFM monitoring
- Expanded rooftop unit ventilation air capabilities
- Simple controls integration and operation
- Network displayable energy recovery points
- Lower utility bills due to reduced compressor and heating system operation

For Consulting Engineers

- Factory installed, wired and run tested
- Design operation within normal unit parameters
- Integrated controls and digital point menus
- Compatible with unit integrated dehumidification systems
- Ventilation air / exhaust air CFM monitoring
- Wheel bypass economizer option
- Exhaust fan operation for ducted exhaust runs
- Intake and Exhaust self balance airflows ensuring proper design implementation
- Building pressure control capability

For Contractors

- Start up and configuration through push button *Comfort*Link controller
- Simple controls installation and operation
- No refrigerant components to install
- No additional roofcurb or roof work
- No connecting ductwork
- Simple to service
- Factory warranty coverage
- No field controls integration required
- No additional airflow balancing

The Future of the World Depends on Our Ability... to Sustain it.

As the world's leader in high technology heating, air-conditioning and refrigeration solutions, we believe that market leadership requires environmental leadership. Carrier sets industry standards for environmentally sound business practices and a commitment to sustainability across its products, services and operations. We demonstrate this commitment by creating environmentally responsible solutions that consume less energy and incorporate innovations that improve the world — indoors and out.

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EnergyX® Factory Installed Energy Recovery 3-25 Ton Packaged Rooftop Units

turn to the experts



The EnergyX® system is a factory installed integrated energy recovery module for Carrier's WeatherMaster® 3-25 ton light commercial packaged rooftop units. The energy recovery module uses a segmented, enthalpy desiccant wheel to cool, dehumidify or heat the ventilation air before it enters the rooftop unit evaporator coil. Energy recovery module operation is integrated with the rooftop unit's compressor and heat operation through the rooftop unit *Comfort*Link controls.

- Factory Installed
- Singlepoint Power
- Standard Curb: No Adaptors, Extensions or Support Legs
- High System Efficiency
- Push Button System Configuration
- System Configuration and Control Through Rooftop Unit Digital Controls



EnergyX® Factory Installed Energy Recovery 3-25 Ton WeatherMaster® Packaged Rooftop Units

Carrier's EnergyX® is an integrated, factory installed energy recovery module on Carrier's WeatherMaster 3-25 ton gas heat/electric cooling, cooling only and cooling with electric heat models.

FEATURES

The EnergyX integrated factory installed energy recovery system provides a multitude of features to compliment the packaged rooftop unit.

Features include:

- Modulating, variable speed, direct drive backwards curved energy recovery supply and exhaust blowers
- Energy recovery configuration and points table via rooftop unit on-board *Comfort*Link controls
- Ventilation and exhaust airflow monitoring (CFM) capability
- Modulating ventilation damper
- Available economizer (wheel bypass) option
- Ducted exhaust capability
- System uses same roofcurb as standard rooftop unit
- Demand controlled ventilation option

WHY ENERGY RECOVERY?

Efficiency

Using AHRI Guideline V, the efficiency effect of an energy recovery device on a rooftop unit is calculated as a Combined Efficiency Factor (CEF). For rooftop units, this is analogous to a system Energy Efficiency Ratio (EER). Depending on the specific combination of the EnergyX system, CEF values of up to 20 can be achieved. Additionally, the system efficiency factor will increase as the ambient conditions increase, unlike a traditional unit EER value.

Ventilation

Energy recovery significantly reduces ventilation compliance complexity for designing engineers. ASHRAE standards 90.1-2010 and 62.1-2010 require significantly more ventilation air than previous design standards. The benefits of energy recovery on ventilation capabilities will impact building designs that need approximately 25 percent outdoor air or more.

Table 1 shows typical outside air requirements mandatory for a building designed to meet ASHRAE 90.1-2010 and ASHRAE 62.1-2010 standards. Exact values can change based on the occupancy and space designs. Additionally, ASHRAE Standard 189 requires energy recovery for applications with 5-30 percent outside air.

Energy recovery allows the ability for a rooftop unit to meet these ventilation requirements without sacrificing part-load capacity control, occupant comfort or unit efficiency.

Operational Flexibility

Traditional rooftop unit sizing involves the summation of indoor load and outdoor load to achieve the total unit tonnage requirements. Energy recovery allows for the majority of the ventilation load to be separated from the rooftop unit thereby either reducing the required maximum unit tonnage or increasing the ventilation percentage for a given unit size.

This effect on the base rooftop unit size has other indirect advantages such as (but not limited to): physical size, part-load capacity control, operating power consumption and electrical component sizing.

OPERATION

The EnergyX system uses an Airxchange® segmented, enthalpy desiccant wheel to cool, dehumidify or heat the ventilation air before it enters the rooftop unit evaporator coil. Through the integrated rooftop unit *Comfort*Link controller, the energy recovery module functions as the first stage of cooling or heating operation, thus minimizing the rooftop unit's compressor and/or heating system operation. Energy recovery module operation can be configured, viewed, tested and communicated all on a digital network.

Airxchange is a registered trademark of Airxchange Inc.

BENEFITS

The EnergyX® integrated factory installed energy recovery system provides a greater degree of operational and application flexibility while providing high system efficiencies and enhanced operational control, all with a packaged rooftop unit.

Benefits include:

- System efficiencies as high as 20 combined efficiency factor (per AHRI Guideline V)
- Expanded base rooftop unit application range
- Extra cooling, dehumidification and heating capacity or downsize base unit tonnage
- Factory installed energy recovery module
- Uses base rooftop unit roofcurb (no extensions or support rails required)
- Factory wired and configured
- ETL listed single system
- Single point electrical power connection
- Reduced field labor and start up cost
- Configurable ERV set-points using *Comfort*Link controls
- Onboard monitoring of ventilation intake and exhaust air CFM, displayed over digital control network

TABLE 1: VENTILATION AIR

Building Type	% OA
Primary School	75
Secondary School	69
Retail	65
Strip Mall	62
Hospital	54
Outpatient Care	50
Small Office	46
Restaurant	36
Fast Food	34
Large Office	32
Medium Office	27
Warehouse	26
Hotel	23
Grocery	21
Motel	20

Ref: ASHRAE 90.1-2010, 62.1-2010

Graph of CEF vs Application EER (Cooling Mode)

