

# Energy Recovery Controls

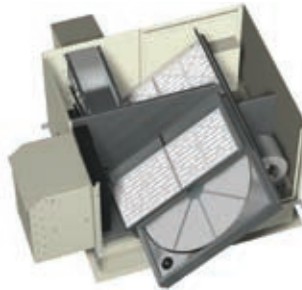
- Non-Tempered Units
- Heating/Cooling Units
- Integral Packaged DX Units



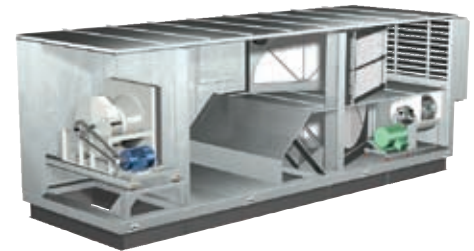
Greenheck energy recovery units come standard with a control center. Components in the control center are single-point wired for hassle-free field installation. All energy recovery units come with an enthalpy wheel to precondition summer air by reducing temperature and moisture levels. The wheel preconditions winter outdoor air by increasing temperature and moisture levels for valuable energy savings and occupant comfort. Optional cooling and/or heating coils are available in certain models to provide space neutral air or dehumidified air capable of handling room latent loads. Integral packaged DX units provide the ultimate in ease of installation and single source responsibility. Below is a list of the standard unit controls for each type of energy recovery unit.

## Non-Tempered

- Door interlocking disconnect
- 24 Vac control transformer
- Motor starters for supply fan and exhaust fan
- Contactor for energy recovery wheel motor
- Low voltage terminal interface for connection to Building Management System (BMS) for:
  - Occupied/Unoccupied
  - Unit On/Off



## Model ERV, APEX

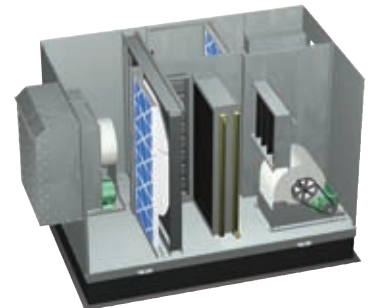


*(refer to page 4 for additional controls)*

## Heating / Cooling

## Model ERH, ERCH, ERT, APEX, VersiVent

- Door interlocking disconnect
- 24 Vac control transformer
- Motor starters for supply fan and exhaust fan
- Contactor for energy recovery wheel motor
- Low voltage terminal interface
- Optional electric post-heater:
  - Discharge control – SCR
- Optional indirect gas furnace (not on ERT):
  - Discharge control – 2-stage or modulating control (50% turndown)

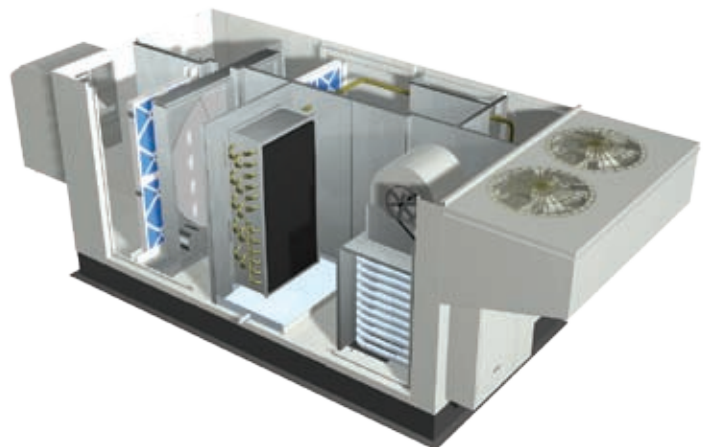


*(refer to pages 3 & 4 for additional controls)*

## Integral Packaged DX

## Model ERCH, VersiVent

- Door interlocking disconnect
- 24 Vac control transformer
- Motor starters for supply fan and exhaust fan
- Contactor for energy recovery wheel motor
- Low voltage terminal interface
- High pressure manual reset cutout
- Low pressure auto reset cutout
- Time delay relay for compressor protection
- Head pressure control
- Optional electric post-heater:
  - Discharge control – SCR
- Optional indirect gas furnace:
  - Discharge control – 2-stage or modulating control (50% turndown)



*(refer to pages 3 & 4 for additional controls)*

## Space Temperature Control - for units with DX Cooling and Electric or IG Heat

- Terminal Points in Unit:
  - Occupied/Unoccupied
  - Call for Cool
  - Call for Heat
  - Call for Dehumidification
- Occupied/unoccupied, call for cool, and call for heat signals can come from a space thermostat or Building Management System (BMS)
- Dehumidification is triggered by a humidistat and overrides all other signals (HGRH required)



Unoccupied mode shuts down the unit and will trigger one of two sequences:

- 1) Unit with night setback damper. On a call for cool or heat, only the supply fan energizes along with the appropriate coil to temper the space with recirculated air.
- 2) Unit without night setback damper. Entire unit energizes to temper space with outdoor air.

## Discharge Temperature Control - ERH, ERCH, ERT, APEX, VersiVent

### Analog Control

#### Cold Air Supply

- Cooling Mode:
  - 55DB/55WB (adjustable) discharge
  - Heat locked out
- Heating Mode:
  - 70DB (adjustable) discharge

#### Neutral Air Supply

- Cooling Mode:
  - Cool to 55DB/55WB (adjustable)
  - Reheat to 70DB discharge
- Heating Mode:
  - 70DB (adjustable) discharge



A series of thermostats are mounted in the unit to control leaving air temperature and dew point.

- Occupied/Unoccupied modes can be controlled by factory-supplied time clock or BMS
- Heating/Cooling changeover can be controlled by factory-mounted outdoor air temperature sensor or BMS

### Microprocessor Control

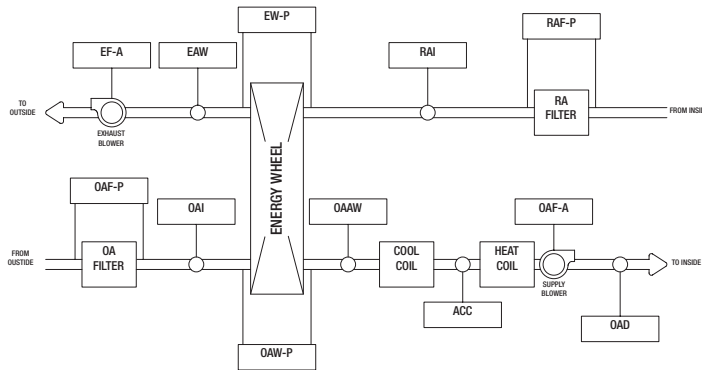
The microprocessor controller is fully programmed, wired and tested at the factory.

- LCD readout for changing set points and monitoring unit operation
- Outdoor Air reset — discharge temperature set point automatically adjusts based on outdoor air temperature
- Optional Room Temperature reset — discharge temperature set point automatically adjusts based on room temperature
- Optional Room Humidity reset — discharge dew point set point automatically adjusts based on room humidity
- Network compatibility:
  - LonWorks FTT-10A
  - Modbus-RTU (over RS-485)
  - BACnet



## Factory Mounted Sensors - Available on ERV, ERH, ERCH, ERT, APEX, VersiVent

Factory mounted temperature, pressure, and current sensors are available in the locations indicated on the unit diagram below. Refer to table for sensor descriptions. The specific sensors provided on a given unit are labeled in the unit control center on the terminal strip. Sensors are wired to the terminal strip to make it easy for the controls contractor to connect the Building Management System (BMS) for monitoring purposes.



Temperature Sensors (1K Ohm RTD)	
Drawing Labels	Terminal Strip Labels
OAI	OA/Supply Inlet Temp
OAAW	OA After Wheel
ACC	After Cooling Coil Temp
OAD	Supply Discharge Temp
EAW	Exhaust After Wheel Temp
RAI	RA/Exhaust Inlet Temp
Pressure Sensors (analog or digital)	
Drawing Labels	Terminal Strip Labels
OAF-P	OA/Supply Filter Pressure
OAW-P	Outdoor Air Wheel Pressure
RAF-P	RA/Exhaust Filter Pressure
EW-P	Exhaust Wheel Pressure
Amp - Current Sensors (analog or digital)	
Drawing Labels	Terminal Strip Labels
OAF-A	Supply Fan Amps
EF-A	Exhaust Fan Amps

## Sub-System Controls - Available on ERV, ERH, ERCH, ERT, APEX, VersiVent

Greenheck Specific Controls	Description
<b>Frost Control</b>	
<i>Timed Exhaust</i>	Supply fan cycles on-off upon frost detection.
<i>Electric Preheat</i>	Preheats outdoor air upon frost detection.
<i>Modulating Wheel</i>	Modulates wheel upon frost detection.
<b>Economizer</b>	
<i>On/Off Temperature</i>	Two temperature sensors create a deadband where wheel is off.
<i>On/Off Enthalpy</i>	Enthalpy sensor and temperature sensor create a deadband where wheel is off.
<i>Modulating Wheel</i>	Wheel modulates to control discharge temperature off wheel.
<b>Dirty Filter Sensor</b>	
<i>Outdoor Air</i>	Monitors filter pressure drop. Wired to control center for BMS to monitor.
<i>Exhaust Air</i>	Monitors filter pressure drop. Wired to control center for BMS to monitor.
<b>CO2 Sensor</b>	
<i>On/Off</i>	CO2 sensor ships loose. Unit turns on or off based on space CO2 levels.
<i>Modulating</i>	CO2 sensor mounted or shipped loose. Signal modulates blowers to vary airflow.
<b>Multi-Speed Blower</b>	
<i>2-Speed</i>	Variable frequency drive programmed for 2-speed operation. Input signal required.
<i>Modulating</i>	Variable frequency drive programmed for modulating operation. Input signal required.
<b>Rotation Sensor</b>	
<i>Energy Recovery Wheel</i>	Monitors wheel rotation. Wired to control center for BMS to monitor.

### Our Warranty

Greenheck warrants this equipment to be free from defects in material and workmanship for a period of one year from the purchase date. The energy recovery wheel is warranted to be free from defects in material and workmanship for a period of five years from the purchase date. Any units or parts which prove defective during the warranty period will be replaced at our option when returned to our factory, transportation prepaid. Motors are warranted by the motor manufacturer for a period of one year. Should motors furnished by Greenheck prove defective during this period, they should be returned to the nearest authorized motor service station. Greenheck will not be responsible for any removal or installation costs.

As a result of our commitment to continuous improvement, Greenheck reserves the right to change specifications without notice.

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