

Product Specification Guide HE05-IN  
RenewAire Model ERV - Air-to-Air Energy Recovery Ventilator  
For Outdoor or Indoor Installation  
CSI MasterFormat Category 23 72 00

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To view RenewAire product data to include unit description, catalog and instruction manuals, go to [www.renewaire.com/our-ervs/](http://www.renewaire.com/our-ervs/)

This product is available in multiple different configurations. The unit is typically installed as an element of a building HVAC system.

Questions regarding this product should be directed to your local RenewAire authorized representative. To locate your local rep, go to [www.renewaire.com/how-to-buy/find-a-dealer/](http://www.renewaire.com/how-to-buy/find-a-dealer/) and select your region.

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## **SECTION 23 72 00 - AIR-TO-AIR ENERGY RECOVERY VENTILATOR**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- This section includes Air-to-Air Energy Recovery Ventilators for indoor installation.
- Within this document, these units may be referred to as Energy Recovery Ventilator (ERV) for brevity.

#### **1.2 RELATED**

Drawing and general provisions of the contract, including General Requirements Division 01, Division 23, Division 23 Specifications Sections, and common work requirements for HVAC apply to work specified in this section.

- Section 23 09 00: Controls and Instrumentation

#### **1.3 SUBMITTALS**

- Product data: For each type or model of Energy Recovery Ventilator, include the following:

- Unit performance data for both Supply Air and Exhaust Air, with system operating conditions indicated.
- Enthalpy plate performance data for both summer and winter operation.
- Motor ratings and unit electrical characteristics.
- Dimensioned drawings for each type of installation, showing isometric and plan views, to include location of attached ductwork and service clearance requirements.
- Estimated gross weight of each installed unit.
- Filter types, quantities, and sizes
- Installation, Operating and Maintenance manual (IOM) for each model.
- LEED Submittals:
  - Provide data for prerequisite E01: Documentation indicating that units comply with ASHRAE 62.1-2010, Section 5 - "Systems and Equipment".
- Shop Drawings: For air-to-air energy recovery ventilators, include plans, elevations, sections, details, and attachments to other work.
  - Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
  - Wiring Diagrams: For power, signal, and control wiring.
- Operation and maintenance data for air-to-air energy recovery ventilator

#### **1.4 QUALITY ASSURANCE**

- Source Limitations: Obtain Air-to-Air Energy Recovery Ventilator with all appurtenant components or accessories from a single manufacturer.
- For the actual fabrication, installation, and testing of work under this section, use only thoroughly trained and experienced workers completely familiar with the items required and with the manufacturer's current recommended methods of installation.
- The ERV core shall be warranted to be free of manufacturing defects and to retain its functional characteristics, under circumstances of normal use, for a period of ten (10) years from the date of purchase. The balance-of-unit shall be warranted to be free of manufacturing defects and to retain its functional characteristics, under circumstances of normal use, for a period of two (2) years from the date of installation.
- Manufacturer shall be able to provide evidence of independent testing of the core by Underwriters Laboratory (UL), verifying a maximum flame spread index (FSI) of 25 and a maximum smoke developed index (SDI) of 50 thereby meeting NFPA90A and NFPA 90B requirements for materials in a compartment handling air intended for circulation through a duct system. The method of test shall be UL Standard 723.
- Certifications:
  - The energy recovery cores used in these products shall be third party Certified by AHRI under its Standard 1060 for Energy Recovery Ventilators. AHRI published certifications shall confirm manufacturer's published performance for airflow, static pressure, temperature and total effectiveness, purge air (OACF) and exhaust air leakage (EATR). Products that are not currently AHRI certified will not be accepted. OACF shall be no more than 1.02 and EATR shall be zero when application design criteria reduce static pressure differential to zero or less.
  - Entire unit shall be listed under UL 1812 Standard for Ducted Air to Air Heat Exchangers and comply with CSA Standard 22.2.
- Every unit to be factory tested prior to shipping: Motor Dielectric Voltage-Withstand Bench Test, Unit Dielectric Voltage-Withstand Test, Continuity of Internal Control Circuits Test, Unit Amperage Test

#### **1.5 COORDINATION**

- Coordinate size and location of all building penetrations required for installation of each Energy Recovery Ventilator and associated electrical systems.
- Coordinate sequencing of construction for associated plumbing, HVAC, electrical supply.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- Available Manufacturers: Subject to compliance with specifications contained within this document, manufacturers offering products that may be incorporated into the work include, but are not limited to:
  - RenewAire
- Manufacturer should be in business for minimum 10 years manufacturing energy recovery ventilators.

## 2.2 MANUFACTURED UNITS

- Air-to-Air Energy Recovery Ventilators shall be fully assembled at the factory and consist of a fixed-plate cross-flow heat exchanger with no moving parts, an insulated single wall G90 galvanized 20-gauge steel cabinet, filter assemblies for both intake and exhaust air, enthalpy core, supply air blower assembly, exhaust air blower assembly and electrical control box with all specified components and internal accessories factory installed and tested and prepared for single-point high voltage connection. Entire unit with the exception of field-installed components shall be assembled and test operated at the factory.

## 2.3 CABINET

- Materials: Formed single wall insulated metal cabinet, fabricated to permit access to internal components for maintenance.
- Outside casing: 20 gauge, galvanized (G90) steel meeting ASTM A653 for components that do not receive a painted finish.
- Access doors shall be hinged with airtight closed cell foam gaskets. Door pressure taps, with captive plugs, shall be provided for cross-core pressure measurement allowing for accurate airflow measurement.
- Cabinet Insulation: Case walls and doors shall be fully insulated with 1 inch, expanded polystyrene foam insulation faced with a cleanable foil face on all exposed surfaces.
- Enthalpy core: Energy recovery core shall be of the total enthalpy type, capable of transferring both sensible and latent energy between airstreams. Latent energy transfer shall be accomplished by direct water vapor transfer from one airstream to the other, without exposing transfer media in succeeding cycles directly to the exhaust air and then to the fresh air. No condensate drains shall be allowed. The energy recovery core shall be designed and constructed to permit cleaning and removal for servicing. The energy recovery core shall have a ten year warranty. Performance criteria are to be as specified in AHRI Standard 1060.
- Control center / connections: Energy Recovery Ventilator shall have an electrical control center where all high and low voltage connections are made. Control center shall be constructed to permit single-point high voltage power supply connections to the non-fused disconnect.
- Passive Frost Control: The ERV core shall perform without condensing or frosting under normal operating conditions (defined as outside temperatures above -10 F and inside relative humidity below 40%). Occasional more extreme conditions shall not affect the usual function, performance or durability of the core. No condensate drains will be allowed.
- Isolation Dampers: None included.

## 2.4 BLOWER SECTION

- Blower section construction, Supply Air and Exhaust Air: Blower assemblies consist of a 120V / 1 Phase / 60 HZ, ECM motor, and a direct driven backward-curved blower.
- Blower assemblies: Shall be statically and dynamically balanced and designed for continuous operation at maximum rated fan speed and horsepower.

## 2.5 MOTORS

- Blower motors shall be electronically commutated (EC) motorized impellers with multispeed capability.
- The impeller type shall be backward-curved.

## 2.6 UNIT CONTROLS

- Fan control: Terminal strip for EC motors.
- Sensors: None

- Timeclock: Digital Time Clock [wall mount][mounting in outdoor, enclosed NEMA 3R enclosure], with up to 8 on/off cycles per day or 50 per week, 24VAC power, with battery backup protection of program settings against power failure to energize unit.
- Motion (Occupancy) Sensor: Passive infrared sensor for [wall][ceiling] mounting with adjustable time-off delay to 30 minutes, 24VAC power to energize unit
- Carbon Dioxide: Adjustable control from 600 - 2000 PPM for [wall][duct] mounting with digital display

## **2.7 FILTER SECTION**

- ERV shall have 2" thick [MERV 10][MERV 13] disposable pleated filters located in the outdoor air and exhaust airstreams. All filters shall be accessible from the exterior of the unit.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- Prior to start of installation, examine area and conditions to verify correct location for compliance with installation tolerances and other conditions affecting unit performance. See unit IOM.
- Examine roughing-in of plumbing, electrical and HVAC services to verify actual location and compliance with unit requirements. See unit IOM.
- Proceed with installation only after all unsatisfactory conditions have been corrected.

### **3.2 INSTALLATION**

- Installation shall be accomplished in accordance with these written specifications, project drawings, manufacturer's installation instructions as documented in manufacturer's IOM, Best Practices and all applicable building codes.
- Install unit with clearances for service and maintenance.

### **3.3 CONNECTIONS**

ERV's are to be installed per manufacturers' guidelines and industry Best Practices shall be incorporated, and duct connections are to conform to use material, weight, thickness, gauge, construction, and installation methods as outlined in the SMACNA publications below, and Division 23 of this document, and are to be made subject to the installation requirements shown above.

- HVAC Duct Construction Standards, Metal and Flexible, 3rd Edition, 2005
- HVAC Air Duct Leakage Test Manual, 2nd Edition, 2012
- HVAC Systems - Duct Design, 4th Edition, 2006
- Rectangular Industrial Duct Construction Standard, 2nd Edition, 2004
- Round Industrial Duct Construction Standards, 2nd Edition, 1999
- Thermoplastic Duct (PVC) Construction Manual, 2nd Edition, 1995
- Electrical installation requirements are specified in Division 26 of this document.

### **3.4 FIELD QUALITY CONTROL**

Contractor to inspect field assembled components and equipment installation, to include electrical and piping connections. Report results to Architect/Engineer in writing. Inspection must include a complete startup checklist to include (as a minimum) the following: Completed Start-Up Checklists as found in manufacturer's IOM. Insert any other requirements here.

### **3.5 START-UP SERVICE**

Contractor to perform startup service. Clean entire unit, comb coil fins as necessary, and install clean filters. Measure and record electrical values for voltage and amperage. Refer to Division 23 "Testing, Adjusting and Balancing" and comply with provisions therein.

### **3.6 DEMONSTRATION AND TRAINING**

Contractor to train owner's maintenance personnel to adjust, operate and maintain the entire Make-Up Air unit. Refer to Division 01 Section Closeout Procedures and Demonstration and Training.