CSI Specification

PRODUCT SPECIFICATION GUIDE TRE200 AND TRE300
S&P USA VENTILATION SYSTEMS LLC MODEL ERV – AIR-TO-AIR ENERGY RECOVERY VENTILATOR FOR INDOOR INSTALLATION
CSI MASTER FORMAT CATEGORY 23 72 00

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To view S&P USA product data to include unit description, catalog and instruction manuals, go to solerpalau-usa.com

The unit is typically installed as an element of a building HVAC system.

Questions regarding this product should be directed to your local S&P USA authorized representative. To locate your local rep, go to https://www.solerpalau-usa.com/resources/locator.html and select your state from the list.

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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.
- The Energy Recovery Ventilator shall be a packaged unit and shall transfer both sensible and latent energy using static plate core technology.
- 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:
  - HVI Certified Performance Data for both Supply Air and Exhaust Air with net airflow at varying external static pressures.
  - Dimensioned drawings showing front, side 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.

- 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.
- 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. ERV manufacturer shall have a minimum of 20 years experience manufacturing ERVs.
- 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 five (5) years from the date of purchase.
- 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 ventilator shall be certified by the Home Ventilating Institute (HVI) under CSA 439. Both a heating and a cooling test must be run to demonstrate year-round energy recovery.
  - Unit shall be listed under UL 1812 Standard for Ducted Air to Air Heat Exchangers. The unit must pass commercial flammability requirements and shall not be labeled “For Residential Use Only”

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:
  - S&P USA
- Manufacturer should be in business for minimum 20 years manufacturing energy recovery ventilators.

2.2 MANUFACTURED UNITS

- Air-to-Air Energy Recovery Ventilators (ERV) 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 painted 22-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.

- The ERV shall use an integral mounting flange and hanging bar system to mount the unit per manufacturer's installation manuals to a structurally suitable surface. The units may be mounted in any orientation.
- The ERV shall have pressure taps on the unit door and onboard adjustable airflow controls for easy airflow balancing of unit.
- The onboard airflow setting controls shall be factory installed and tested.
- The ERV onboard control center shall have the ability to set the high and low airflow for the supply and exhaust fans independently of each airstream.
- The onboard control shall have the capability to set the high and low airflow setting for the supply and exhaust fan using easy to use adjustable airflow dials that are clearly labeled outdoor air or return air and high or low for airflow setting.
- The adjustable airflow setting dial shall have the capability to vary the desired airflow in infinite increments for the supply and exhaust airflows.
- ERV shall have the capability to provide 209 CFM net airflow for TRe200 and 261 CFM for TRe 300 on the supply air at 0.4" w.g. external static pressure.
- The power consumption of the TRe200 ERV shall be 1.80 CFM/watt at HVI tested and rated performance conditions and the power consumption of the Tre300 ERV shall be 2.40 CFM/watt at HVI tested and rated performance conditions. For the TRe200 at 50 CFM, the SRE shall be 78%. For the TRe300 at 60 CFM, the SRE shall be 83%.
- The ERV shall be 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.
- Unit shall have the capacity to operate continuously without the need for bypass, recirculation, pre-heaters, or defrost cycles under normal operating conditions.
- Water vapor transfer shall be through molecular transport by hydroscopic resin and shall not be accomplished by "porous plate" mechanisms. Exhaust and fresh airstreams shall travel at all times in separate passages, and airstreams shall not mix. No metal separators or metal core material shall be acceptable.
- Airflow through the ERV core shall be laminar over the product's entire operating airflow range, avoiding deposition of particulates on the interior of the energy exchange plate material.
- Power rating of the unit shall be 120 volts and 60 Hz.
- The power supply for the ERV units shall be from a 34" line cord.

2.3 CABINET

- Materials: Formed single wall insulated metal cabinet, fabricated to permit access to internal components for maintenance.
- The energy recovery component shall be of fixed-plate cross-flow construction, with no moving parts.
    - 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.
- Outside casing: Shall be constructed of 22-gauge steel, with lapped corners and zinc-plated screw fasteners. The case shall be finished with textured, powder coat paint.
- 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.
- Access door shall provide easy access to blowers, ERV cores, and filters. Access door shall be hinged with airtight closed cell foam gaskets. Doors shall have an airtight compression seal using closed cell foam gaskets.
- The ERV shall have locking door hinges so that the ERV can be installed in multiple orientations.
- Door pressure taps, with captive plugs, shall be provided for cross-core pressure measurement allowing for accurate airflow measurement. Unit shall have (4) Pressure ports allow for easy airflow balancing and verification.
- No condensate drain pans or drains shall be allowed and unit shall be capable of operating in both winter and summer conditions without generating condensate.
- Unit shall have factory-supplied 6"/8" duct collars for easy installation of ductwork to the unit.

- Passive Frost Control: The ERV core shall perform without condensing or frosting under normal operating conditions (defined as outside temperatures above -10ºF 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.

2.4 BLOWER SECTION

- The impeller type shall be backward-curved.
- Blower assemblies: Shall be statically and dynamically balanced and designed for continuous operation at maximum rated fan speed and horsepower.

2.5 MOTORS

- The supply and exhaust fans shall be electronically commutated (EC) Motors with multispeed capability as standard offering.

2.6 UNIT CONTROLS

- Unit shall have the capacity to operate continuously without the need for bypass, recirculation, pre-heaters, or defrost cycles under normal operating conditions.
- The unit shall be capable of operating continuously or intermittently at the low airflow (adj.) setting with the ability to go temporarily to the high airflow (adj.) boost mode.
- The unit shall have an internal 24 VAC transformer and relay.
- The ERV operates at low airflow mode until one of the following energizes the ERV to operate on a high flow boost mode (as airflows are set during start-up and conditioning).
    - Occupancy Sensor
    - Carbon Dioxide Sensor
    - Boost Mode push button switch
    - Proportional Run Time Controller

2.7 FILTER SECTION

- The ERV cores shall be protected by a MERV-8 rated, spun polyester, disposable filter in both airstreams.
- ERV shall have the capability to incorporate an optional 1" thick MERV 13 disposable pleated filters located in the outdoor air airstream.
- All filters shall be accessible from the exterior of the unit.
- The ERV shall have the capability to incorporate an optional 1" thick MERV 13 disposable filter (shipped loose) located in the outdoor airstream, to be installed post construction.

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.
- Locate, orient, and connect ductwork per AMCA, ASHRAE, and SMACNA guidelines. Provide service clearances as indicated on the plans. Locate units distant from sound critical occupancies.
- Use factory supplied mounting flange to mount the unit per manufacturer's installation manuals to a structurally suitable surface. The units may be mounted in any orientation.
- Provide flexible duct connections at unit duct flanges.
- To control sound radiated from the unit:
    - Provide acoustic treatment in mechanical room walls and ceilings.
- To control sound associated with the two blower outlets:
    - Utilize insulated, flexible duct.
    - In sound critical applications provide increased duct sizing and consider the use of sound attenuators.

3.3 CONNECTIONS

- In all cases, industry Best Practices shall be incorporated. Connections are to be made subject to the installation requirements shown above.
- Duct installation and connection requirements are specified in Division 23 of this document.
- Electrical installation requirements are specified in Division 26 of this document.
- All ductwork shall be designed, constructed, supported and sealed in accordance with SMACNA HVAC Duct Construction Standards and pressure classifications.
- At a minimum all duct runs to the outdoors shall be thermally insulated at levels appropriate to the local climate. A continuous vapor barrier shall also be provided on both sides of the insulation.

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. Refer to Division 23 "Testing, Adjusting and Balancing" and comply with provisions therein. Refer to the manufacturer's installation, operation and maintenance IOM manual for startup procedure.
- Test and Balancing may not begin until 100% of the installation is complete and fully functional.
- Follow National Environmental Balancing Bureau (NEBB) air test and balance procedures specific to energy recovery devices. Provide balancing reports to owner's representatives.

3.6 DEMONSTRATION AND TRAINING

- Contractor to train owners or owner's maintenance personnel to adjust, operate and maintain the ERV. Refer to Division 01 Section Closeout Procedures and Demonstration and Training.