

**DIVISION 25 52 33 13**

**PART 1 - GENERAL**

**1.1 RELATED DOCUMENTS AND REFERENCES**

- A. Drawings and general provisions of the Contract apply to this Section, including General and Supplementary Conditions and Division 01 Specification Sections.

**1.2 WORK INCLUDED**

- A. Contractor shall furnish a R134a refrigerant multi-pass air-source heat pump water heater for the generation of domestic hot water up to 150°F. The multi-pass air-source heat pump water heater shall be factory-packaged, factory-fabricated, assembled, charged, and tested. The heater shall include a semi-hermetic compressor, and two axial fans.
- B. The heat pump water heater shall be supplied complete and pre-assembled entirely by one manufacturer.
- C. The heat pump water heater shall have a stainless-steel, double-wall, vented, brazed-plate heat exchanger.

**1.3 SUBMITTALS**

- A. Submit drawings and product information to include, product data sheet, dimensions, rated-capacities, shipping weights and accessories.
- B. Submit wiring diagram for piping and electrical orientations.
- C. Submit manufacturer's certified capacity data.
- D. Submit manufacturer's installation, start-up, and maintenance instructions.
- E. Submit manufacturer's installation and operation manual.

**1.4 QUALITY ASSURANCE**

- A. Reference Standards
  - 1. UL 1995 / CSA C22.2 No. 236 Safety for Heating and Cooling Equipment
  - 2. ASHRAE 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings
  - 3. International Building Code (IBC)
  - 4. International Plumbing Code (IPC)
  - 5. Uniform Plumbing Code (UPC)
  - 6. ANSI/ASHRAE Standard 135 BACnet – A Data Communication Protocol for Building Automation
  - 7. UL 916 Energy Management System (EMS)

B. Certifications, Listings and Other

1. UL -1995 - Certification
2. NSF/ANSI 61 – Certification
3. NSF/ANSI/CAN 372
4. NSF61/372
5. CEC -Listing
6. CBEC -Listing
7. DOE/ASHRAE – Tested to
8. ENERGY STAR -Listed (HPDH-135HNU-201 & HPHD-135VNU-201)
9. Mass Code – Listing

C. Each submittal shall be provided with documentation certifying that all materials, products, components, and test reports are in compliance with the design requirements for this project.

D. Furnish all equipment, material, and accessories new and free from defects.

1.5 WARRANTY

A. Limited one-year warranty.

B. Refer to Rheem Instruction and Operation / Use and Care Manual for exemptions.

**PART 2 - PRODUCTS**

2.1 MANUFACTURER

A. Raypak Inc.

1. Product: Commercial Air-to-Water Heat Pump

2.2 CONSTRUCTION

A. The heat pump shall be constructed of an aluminum stucco metal cabinet, with an epoxy-coated evaporator coil for added protection in harsh or coastal climates.

B. The heat pump shall be constructed in a manner where all refrigerant lines and components (compressor, evaporator, condenser) are contained within a single cabinet enclosure.

C. The heat pump shall be supplied complete and pre-assembled entirely by one manufacturer.

D. The water heater shall be suitable for indoor or outdoor installation and shall operate efficiently at an ambient air temperature as low as 41°F without the need for supplemental heat.

## 2.3 COMPONENTS

### A. Compressor

1. Compressor shall be an electromechanical device that increases the pressure of superheated refrigerant vapor by decreasing its volume, as well as increasing its temperature due to the addition of the heat-of-compression. The increase in pressure causes the refrigerant to circulate through the refrigeration system.

### B. Hot Water Heat Exchanger

1. A stainless-steel, double-wall, vented, brazed-plate heat exchanger, containing three chambers; one for refrigerant, one for hot water and a third separating chamber which is open to atmosphere (vented).

### C. Evaporator Fans

1. An electromechanical device that draws ambient air through the evaporator and exhausts cooled air via the top (vertical discharge models) or side (horizontal discharge models) of the heat pump. Each heat pump shall have two evaporator fans wired in parallel.

### D. Refrigeration Circuit.

1. Sealed water heater components are components that carry refrigerant only (compressor, hot water heat exchanger, thermal expansion (TX) valve, filter drier, evaporator, defrost solenoid valve, pressure transducers and associated pipe work).

### E. Refrigerant Type

1. System shall operate on refrigerant R134a.

### F. Electrical Circuit

1. The heater LCD display panel shall be able to control the utility setpoint temperature, manage the recirculation pump, and variable sensors.
2. The heater's internal electrical panel shall consist of two (2) circuit breakers to protect the auxiliary and power circuits, compressor contactor, fan revolution, regular condensation control, a pump relay or motor protection and contactor, and a microprocessor control with display of the main functions.
3. The heat pump shall include a high-voltage terminal strip for supply voltages. Supply voltages shall be 208V/1PH/60hz (HPDH-60) or 480V/3PH/60Hz (HPHD-135).

### G. Auxiliary boost operation

1. The heat pump shall be able to control an auxiliary heating source.

### H. Operation at low ambient temperature

1. The heat pump shall have a low ambient mode of operation with dynamic defrost protection and activation of auxiliary electric or gas heater.
2. Dynamic Defrost Protection

Heat pump water heater must have dynamic defrost cycle based on outdoor evaporator coil temperature with option for fixed defrost temperature and is accomplished by internal hot gas injection.

I. Recirculation Pump

1. The recirculation pump shall be an external connected pump powered by the electrical control of the heat pump water heater.

J. Electronic Control System

1. The controller shall provide the option for external control by a central Building Management System.
2. The control system shall feature an LCD display and an internal clock.
3. The heat pump shall be capable of "cascade" operation with up to 4 other appliances. The heat pump must be capable of both master and follower operation.

K. Communications

1. The heat pump water heater shall be able to be an integrated component of a high-speed, peer-to-peer internetwork of ANSI/ASHRAE Standard 135, BACnet using native BACnet communications via RTU or IP/MSTP. System shall also support Modbus networking.
2. The integrated LCD display shall provide fast communication via user-friendly menu driven configuration.

L. Operations

1. The water heater is a multi-pass water heater. The pump pulls water out of the storage tank at constant flow rate (GPM), and it takes multiple passes before the storage tanks reach the prescribed setpoint temperature.

## **PART 3 - EXECUTION**

### **3.1 INSTALLATION**

A. Piping and Connections

1. Manufacturer's installation instructions, including required clearance, piping and electrical guidelines.
2. Manufacturer's representative to verify proper and complete installation.

### **3.2 START-UP**

- A. Engage a factory-authorized service representative to provide startup of the heat pump water heater, inspect components, assemblies, and equipment installations, including connections, and to assist in testing and training upon completion of the startup.

### 3.3 TRAINING

- A. Provide factory-authorized service representative to train maintenance personnel on procedures and schedules related to start-up, shutdown, troubleshooting, servicing, and preventive maintenance.
- B. Schedule training at least fourteen days in advance.

### 3.4 WARRANTY

- A. For warranty information, refer to Rheem Commercial Heat Pump Water Heater warranty document.

**END OF SECTION**