

Section 15_ _ _
Hot Water Air Handling System

Part 1: GENERAL

1.1 Section Includes:

- A. Hot Water Heaters
- B. Controls (most by Others)
- C. Equipment Schedule

1.2 Related Sections:

- A. Section 01655: Starting up mechanical systems
- B. Section 15070: Pipe and pipe fittings
- C: Section 15100: Valves
- D: Section 15120: Piping Specialties
- E: Section 15400: Plumbing System
- F: Section 15990: Testing, adjusting and balancing
- G: Section 16050: Basic electrical materials and methods

1.3 References

- A. **American National Standards Institute (ANSI)** : Establishes requirements applicable to certifying direct gas-fired heaters.
- B. **ETL Testing Laboratories** : Independent testing facility certifies standards conformance.
- C. **American Conference of Governmental Hygienists (ACGIH)** : Establishes air quality standards.
- D. **Environmental Protection Agency (EPA)** : Enforces outdoor air quality standards.
- E. **Occupational Safety & Health Administration (OSHA)** : Enforces air quality standards and safety in the work place.
- F. **National Electric Code (NEC)** : Establishes electrical standards.
- G. **Underwriters Laboratory (UL)** : Independent testing facility certifies component conformance to appropriate standards.
- H. **National Fire Protection Agency (NFPA)** : Establishes fire prevention standards.

I. Factory Mutual Insurance (FM) : Certifies gas manifold to owner's insurance carrier.

J. Industrial Risk Insurance (IRI) : Certifies gas manifold to owner's insurance carrier.

1.4 Quality Assurance

Manufactures shall:

- A. Provide an air handler built in conformance the UL 1995 standard. The heater shall be tested and certified to the appropriate standard listed above by a Nationally Recognized Testing Laboratory, and bear their mark (ETL, UL or CSA are acceptable).
- B. Furnish proof, satisfactory to the owner or his representative, of having manufactured hot water space heating systems for a minimum of ten years.
- C. Make its facility available to owner or his representative for quality control audits without prior notification.

1.5 Submittals

- A. Manufacturer shall submit product data, including dimensions, duct & service connections, accessories, controls with schematics and sequence of operation, electrical nameplate data, wiring diagrams, and fan curves and burner & filter data.
- B. Manufacturer shall furnish rigging, assembly, and installation instructions.
- C. Manufacturer shall furnish Operation & Maintenance Manuals, including descriptive literature, operation instructions, maintenance and repair data, and parts listing.

2.1 Acceptable Manufacturers

AbsolutAire, Inc. (Kalamazoo, MI) (269) 382-1875

2.2 Hot Water Heating Section

Manufacturer shall:

- A. Provide a hot water heated indoor, Horizontal heater with 85%/15% Recirculation 'B' model with variable outdoor air feature for dual operation, either 100% OA or 15% OA with 85% return air from the space.

- B. Provide self-contained, packaged heaters which shall include; casing; coil; non-overloading fan; motor; mixing chamber; positive position, variable outdoor-air/return-air dampers; and automatic controls for both temperature.
- C. Provide a casing, which shall be a minimum of 16-gauge aluminized steel and continuously welded for airtight and watertight construction. Both interior and exterior structural steel shall be gray-oxide primed. All exterior casing seams shall be 100% weather-tight. All interior and exterior surfaces will be cleaned of all oil and grease. Painted exterior will consist of a high-quality catalyzed primer coat and a finish coat of machine enamel with rust inhibitors. Color is may selected by the owner. All interior surfaces will be lined with 1-inch thick, 1-1/2 pound density, coated fiberglass when specified. The insulation shall comply to UL standard 181 for erosion and NFPA 90A for fire resistance. All exposed edges will be coated to eliminate erosion. Fiberglass will be held in place with both adhesive and welded pins, per SMACNA standards. Provide a minimum of (2) hinged access doors with positive latching, watertight handles. All weather enclosure doors shall be painted the interior as well as the exterior and shall include braces that lock the door open during servicing.
- D. Provide a filter mix-box to provide filtration of all outdoor and return air through the same filter media (85/15 Model). Polyester media with internal wire frame linked together and running continuously across the full width of the filter housing. This filter shall be 30% efficient and allow no air to bypass around it. Manufacturer shall provide a clogged filter warning (light/alarm).
- E. Provide a hot water coil constructed of 0.020" thick copper tubes and 0.0075" thick aluminum fins and a galvanized case. The coil shall have male NPT threaded Schedule 40 pipe connections for both the supply and return stubbed to the exterior of the air handlers housing. All hot water control valves and plumbing specialties shall be by others.
- F. Provide outdoor air velocity across the coil, which shall be constant and between 500 and 800 FPM through the burner profile. The coil velocity shall be constant at all times throughout the operation of the heater.
- G. The supply fan shall be a Single-Width, Single-Inlet, centrifugal plenum design, and belt driven for the required air capacity. The motor shall be EPACT compliant, mounted on an adjustable slide base and shall be open drip-proof with a safety factor of 1.15. It shall be suitable for continuous service at 120 degrees F ambient temperature, and shall be wired for the selected voltage, 1750 RPM and standard NEMA frame. Blower, motor and drive shall be factory tested to guarantee the specified air delivery (per ANSI standards) at the design total static pressure. Fan shaft shall be connected to the motor by multi V-Belt drive, capacity designed for 130% of the motor nameplate horsepower. Fan shaft shall be of a turned, ground and polished shafting. A protective coating shall be applied to the shaft to minimize

oxidation. Bearings shall be Spherical Roller type bearings and shall be designed for an L10 life of 100,000 hours or better. The bearings shall have a labyrinth type seal so they can self-purge any excessive grease. Bearings shall have extended lubrication lines, which shall terminate at the heater outer skin so that lubrication can be performed without shutting down the system.

H. Provide the following Control Systems

1. The Control Panel

The heater control panel shall be similar to NEMA 3R and contain all standard electrical components, such as Fused disconnect switch; motor starter; 120-volt and 24-volt transformers; control circuit fuses; a number-coded terminal strip.

2. The Space Temperature Control

Shall be provided by others to operate the Hot water control valve.

3. The Remote Control Panel (RCP)

A remote control monitoring panel shall be provided which incorporates all heater operating switches and circuit analyzer lights. The remote control panel shall be painted mild steel. Wiring to remote panel from the main control panel shall be accomplished with low voltage (24/120-volt maximum) wiring circuits. The control panel shall provide each heater with the following:

5. The Low-Temperature Limit Switch

This switch turns the fan motor off when cold air is being discharged from the heater. The minimum discharge temperature may be selected from 0 degrees to 70 degrees F. A integral timer shall by-pass this switch for five (5) minutes on initial start-up.

2.3 Accessories - Manufacturer shall provide the following accessories:

A. Discharge Head (where noted on plans)

Manufacturer shall provide double deflection, 360-degree discharge head(s), as detailed on the plans. The head shall be constructed of a minimum of 16-gauge aluminized steel. Adjustable, locking, double deflection blades will be provided to control direction of airflow, both vertically and horizontally. Each discharge head will be properly cleaned and then prime and finish coat painted to match the heater. 360-degree discharge heads shall be provided with insulation (1" thick 1-1/2# density) installed on the interior floor area for noise reduction.

B. Vibration Isolators

Vibration isolators shall consist of a steel housing and an isolation element, molded entirely of a colored oil-resistant neoprene stock for easy identification of capacity.

The hangers shall have a deflection of 1/4" or less and will be supplied by the heater manufacturer.

- C. **Steel Channels** Structural steel channels shall support the heater and service platform (optional) as one. Any hangers and miscellaneous hardware will be furnished by the installing contractor.