SECTION 238200 - CONVECTION HEATING AND COOLING UNITS

This Section includes coils for installation in air systems, utilizing water, glycol/water, steam, and refrigerants as heat transfer media. This section also includes electric resistance heating coils, electric heaters, and terminal heating and cooling units such as unit heaters, fan coils, and unit ventilators used in hydronic and steam heating systems.

Manufacturers found in SpecAgent for this Section were identified as representative and not as an endorsement for meeting the requirements of this specification.

This Section includes performance, proprietary, and descriptive type specifications. Edit to avoid conflicting requirements.

This Section includes the term Architect/Engineer. "Architect" is used in AIA contract documents; "Engineer" is used in EJCDC contract documents. Retain appropriate term.

See the Drawing Coordination Considerations for information needed to coordinate this specification Section with the Drawings.

1. GENERAL
   * + 1. SUMMARY
          1. Section Includes:

Air coils.

Electric coils.

Baseboard radiation.

Finned tube radiation.

Convectors.

Unit heaters.

Cabinet unit heaters.

Electric unit heaters.

Fan coil units.

Unit ventilators.

Hydronic radiant heaters.

Induction units.

Electric radiant heaters.

Electric baseboard radiation.

Electric unit heaters.

* + - * 1. Related Sections:

Section 230513 - Common Motor Requirements for HVAC Equipment: Product requirements for motors for placement by this section.

Section 230700 - HVAC Insulation: Execution requirements for insulation specified by this section.

Section 232113 - Hydronic Piping: Execution requirements for connection of chilled water, hot water, and drain piping to units specified by this section.

Section 232116 - Hydronic Piping Specialties: Product requirements for hydronic piping specialties for placement by this section.

Section 232213 - Steam and Condensate Heating Piping: Execution requirements for connection of steam supply and steam condensate return piping to units specified by this section.

Section 232216 - Steam and Condensate Piping Specialties: Product requirements for steam piping specialties for placement by this section.

Section 232300 - Refrigerant Piping: Execution requirements for connection of refrigerant piping to units specified by this section.

Section 233100 - HVAC Ducts and Casings: Execution requirements for ducts specified by this section.

* + - 1. REFERENCES

List reference standards included within text of this section. Edit the following for Project conditions.

* + - * 1. Sheet Metal and Air Conditioning Contractors:

SMACNA - HVAC Duct Construction Standard - Metal and Flexible.

* + - 1. SUBMITTALS
         1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the
         2. Manufacturer’s installation instructions shall be provided along with product data.
         3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).

Only request submittals needed to verify compliance with Project requirements.

* + - * 1. Section 013300 - Submittal Procedures: Submittal procedures.
        2. Shop Drawings: Indicate cross sections of cabinets, grilles, bracing and reinforcing, and typical elevations. Indicate schedules of equipment and enclosures typically indicating length and number of pieces of element and enclosure, corner pieces, end caps, cap strips, access doors, pilaster covers.
        3. Product Data: Submit coil and frame configurations, dimensions, materials, rows, connections, and rough-in dimensions. Submit mechanical and electrical service locations, capacities and accessories or optional items.

Include the following paragraph for submission of physical samples for selection of finish, color, texture, and other properties.

* + - * 1. Samples: Submit **[one] <\_\_\_\_\_\_\_\_>** sample of each radiation cabinet detailed.
        2. Manufacturer's Installation Instructions: Submit assembly, support details, and connection requirements.
        3. Manufacturer's Certificate: Certify products meet or exceed specified requirements.
      1. CLOSEOUT SUBMITTALS
         1. Section 017716 - Contract Closeout: Closeout procedures.
         2. Project Record Documents: Record actual locations of components and locations of access doors in radiation cabinets required for access to valves.
         3. Operation and Maintenance Data: Submit manufacturers descriptive literature, operating instructions, installation instructions, maintenance and repair data, and parts listings.
      2. QUALITY ASSURANCE

Include the following paragraph only when cost of acquiring specified standards is justified.

* + - * 1. Maintain one copy of each document on site.
      1. QUALIFICATIONS
         1. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years' **[documented]** experience.
         2. Installer: Company specializing in performing Work of this section with minimum three years' [documented] experience **[approved by manufacturer]**.
      2. PRE-INSTALLATION MEETINGS
         1. Section 013000 - Administrative Requirements: Pre-installation meeting.
         2. Convene minimum **[one] <\_\_\_\_\_\_\_\_>** week prior to commencing work of this section.
      3. DELIVERY, STORAGE, AND HANDLING
         1. Section 016500 - Materials and Equipment: Product storage and handling requirements.
         2. Accept units on site in factory packing. Inspect for damage. Store under roof.
         3. Protect coil fins from crushing and bending by leaving in shipping cases until installation, and by storing indoors. Protect coils from entry of dirt and debris with pipe caps or plugs.
      4. FIELD MEASUREMENTS
         1. Verify field measurements prior to fabrication.
      5. WARRANTY

This article extends warranty period beyond one year. Extended warranties increase construction costs and Owner enforcement responsibilities. Specify warranties with caution.

* + - * 1. Product warranties and product bonds.
        2. Furnish **[five] <\_\_\_\_\_\_\_\_>**-year manufacturer's warranty for [[fan-coil unit] [unit heater] [unit ventilator] motors] **<\_\_\_\_\_\_\_\_>**.
      1. EXTRA MATERIALS
         1. Spare parts and maintenance products.
         2. Furnish **[two] <\_\_\_\_\_\_\_\_> [sets of filters] <\_\_\_\_\_\_\_\_>**.

1. PRODUCTS

The following specification can be used for coils in HVAC systems. Edit appropriate paragraphs based on type of system in which coil is used.

* + - 1. AIR COILS

In this article, list manufacturers acceptable for this Project.

* + - * 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Aerofin.

Carrier Global Corporation.

Coil Company, LLC.

Greenheck Fan Corporation.

RAE Coils; a division of RAE Corporation.

Super Radiator Coils.

Trane.

USA Coil & Air.

Approved equivalent.

Edit the following descriptive specifications to identify Project requirements and to eliminate conflicts with manufacturers specified above.

* + - * 1. Fabrication:

Tubes: **[1/2 inch] [5/8 inch]** OD seamless copper **[or brass]** arranged in parallel or staggered pattern, expanded into fins, [silver] brazed joints.

Fins: Aluminum **[or copper]** continuous plate type with full fin collars or individual helical spiral finned tube type wound under tension. **[Solder coat copper spiral fin coils.]**

Casing: Die formed channel frame of **[16] [14] [18] <\_\_\_\_\_\_\_\_>** gage **[galvanized]** [stainless] steel with **[3/8 inch]** mounting holes on **[3] [6] <\_\_\_\_\_\_\_\_>** inch centers. Furnish intermediate center tube supports for plate fin coils longer than **[36] [40] [48]** **<\_\_\_\_\_\_\_\_>** inches. Furnish intermediate tube supports for spiral fin coils at manufacturer’s recommended intervals to eliminate sagging during operation.

* + - * 1. **[Water] [Steam] [Glycol] [Heating] [Cooling]** Coils:

Use the following with cooling or heating coils using water, glycol, or steam as the medium.

Headers: Cast iron with tubes expanded into header, seamless copper tube with silver brazed joints, or prime coated steel pipe with brazed joints.

Leak Testing: Air test under water to **[200] [300] [350] <\_\_\_\_\_\_\_\_>** psig for working pressure of **[200] <\_\_\_\_\_\_\_\_>** psig and **[200] <\_\_\_\_\_\_\_\_>** degrees F.

Use the following with water or glycol heating coils.

Configuration: Self draining circuitry, with threaded plugs **[in headers]** for drain and vent; serpentine type with return bends on smaller sizes and return headers on larger sizes. **[Furnish threaded plugs in return bends or in headers opposite top and bottom of each tube.]**

Use the following with steam heating coils.

Configuration: Self Draining circuitry, with threaded plugs [in headers] for drain and vent, threaded plugs in return bends or headers opposite each top and bottom tube, sloped within frame to condensate connection.

Fin Spacing: **[4] [6] [8] [9] [10] [11] [12] [13] [14] [15] [16] [18] <\_\_\_\_\_\_\_\_>** fins per inch.

* + - * 1. Refrigerant **[Cooling]** Coils:

Headers: Seamless copper [or brass] tubes with silver brazed joints.

Liquid Distributors: Brass or copper venturi or orifice type or removable nozzle type distributor with seamless copper distributor tubes, minimum 1/4 inch OD for refrigerant R-22; maximum **[12] [18] <\_\_\_\_\_\_\_\_>** circuits for each distributor.

Leak testing: Air test under water at **[300] [450]** psig for working pressure of **[250] [300]** psig; dehydrate, and seal with dry air or nitrogen charge.

Configuration: Self-draining, down feed with bottom non-oil trapping connection.

Fin Spacing: **[**6**] [**8**] [**10**] [**11**] [**12**] [**14**] [**15**] [**16**] [**18**] <**\_\_\_\_\_\_\_\_**>** fins per inch.

* + - * 1. Steam Distribution Heating Coils:

Headers: Cast iron with tubes expanded into header, or prime coated steel pipe with brazed joints or seamless copper tube with silver brazed joints.

Smaller tube sizes are common only on small coils and may be limited to only few manufacturers.

Tubes: **[11/16] [5/8] [3/8]** inch OD steam distributing tubes located within **[1] [5/8]** inch OD condensing tubes.

Leak Testing: Air test under water to **[200] [300] [350] <\_\_\_\_\_\_\_\_>** psig for working pressure of **[150] <\_\_\_\_\_\_\_\_>** psig and **[366] <\_\_\_\_\_\_\_\_>** degrees F.

Configuration: Self draining circuitry, with threaded plugs **[in headers]** for drain and vent; with **[steam and return connecting on same end or on opposite end.] [double steam connection, one at each end and one or two return connections.] [double pass with single steam connection and return at each end.]**

Fin Spacing: **[4] [6] [8] [10] [11] [12] [14] [15] [16] [18] <\_\_\_\_\_\_\_\_>** fins per inch.

* + - 1. ELECTRIC COILS

In this article, list manufacturers acceptable for this Project.

* + - * 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Brasch Manufacturing Co., Inc.

Chromalox, Inc.

INDEECO.

Approved equivalent.

Edit the following descriptive specifications to identify Project requirements and to eliminate conflicts with manufacturers specified above.

* + - * 1. Assembly: UL listed and labeled, with terminal control box and [hinged] cover, splice box, coil, casing, and controls.
        2. Coil: **[Enclosed copper tube, aluminum finned element of coiled nickel-chrome resistance wire centered in tubes and embedded in refractory material] [.] [or] [Exposed helical coil of nickel-chrome resistance wire with refractory ceramic support bushings.]**
        3. Casing: Die formed channel frame of **[16] [14] [18] <\_\_\_\_\_\_\_\_>** gage galvanized steel with **[3/8 inch]** mounting holes on **[3] [6] <\_\_\_\_\_\_\_\_>** inch centers. Furnish tube supports for coils longer than **[36] [40] [48] <\_\_\_\_\_\_\_\_>** inches.
        4. Controls: Automatic reset thermal cut-out, built-in **[magnetic] [mercury]** contactors **[,] [.]** **[control circuit transformer and fuse,] [manual reset thermal cut-out,] [air flow proving device,]** **[fused disconnect,] [non-fused disconnect,] [load fuses.]**
      1. BASEBOARD RADIATION

In this article, list manufacturers acceptable for this Project.

* + - * 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Haydon Corporation.

Rosemex Products.

Slant/Fin Corp.

Sterling HVAC Products; a Mestek company.

Approved equivalent.

Edit the following descriptive specifications to identify Project requirements and to eliminate conflicts with manufacturers specified above.

* + - * 1. Heating Elements: 3/4 inch ID copper tubing mechanically expanded into flanged collars of evenly spaced aluminum fins, one tube end belled.
        2. Enclosure: Minimum 0.030 inch thick steel with **[7 inch] [10 inch] [<\_\_\_\_\_\_\_\_> inch]** high back and top of one piece; front panel, end panel, end caps, corners, and joiner pieces to snap together, with front panel easily removable. Furnish full-length damper.
        3. Finish: Factory applied baked enamel **[of <\_\_\_\_\_\_\_\_> color [as selected]]**.
        4. Element Brackets: 0.0516 inch thick galvanized steel to support from panel and noise free element cradle.
        5. Capacity: As scheduled, based on 65 degrees F entering air temperature, **[180 degrees F average water temperature] [one psi steam]**.
      1. FINNED TUBE RADIATION

In this article, list manufacturers acceptable for this Project.

* + - * 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

INDEECO.

Markel Products; TPI Corporation.

Marley Engineered Products.

Ouellet Canada Inc.

STELPRO DESIGN INC.

Trane.

Approved equivalent.

Edit the following descriptive specifications to identify Project requirements and to eliminate conflicts with manufacturers specified above.

* + - * 1. Heating Elements: **[3/4 inch] [1 inch] [1-1/4 inch]** ID seamless copper tubing, mechanically expanded into evenly spaced aluminum fins sized **[4 x 4 inches] <\_\_\_\_\_\_\_\_>**, suitable for soldered fittings.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

* + - * 1. Heating Elements: 1-1/4 inch ID steel tube, mechanically expanded into evenly spaced steel fins.
        2. Element Hangers: Quiet operating, ball bearing cradle type providing unrestricted longitudinal movement, on enclosure brackets.
        3. Enclosures: 0.0478 inch thick steel up to 18 inches in height, 0.598 inch steel over 18 inches in height **[or aluminum as detailed]**, with easily jointed components for wall to wall installation. Support rigidly, on wall or floor mounted brackets **[at least 3 feet on center maximum]**.
        4. Finish: Factory applied baked **[primer coat] [enamel of <\_\_\_\_\_\_\_\_> color [as selected]]**.
        5. Damper: Where heating media is not thermostatically controlled, furnish knob-operated internal damper at enclosure air outlet.
        6. Access Doors: For otherwise inaccessible valves, furnish factory-made permanently hinged access doors, 6 x 7 inch minimum size, integral with cabinet.
        7. Capacity: As scheduled, based on 65 degrees F entering air temperature, **[180 degrees F average water temperature] [one psi steam]**.
      1. CONVECTORS

In this article, list manufacturers acceptable for this Project.

* + - * 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Engineered Air.

Rosemex Products.

Slant/Fin Corp.

Sterling HVAC Products; a Mestek company.

Trane.

Approved equivalent.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

* + - * 1. Furnish materials in accordance with **[State] [Municipality] of <\_\_\_\_\_\_\_\_> [Highways] [Public Work's]** standards.

Edit the following descriptive specifications to identify Project requirements and to eliminate conflicts with manufacturers specified above.

* + - * 1. Heating Elements: Seamless copper tubing mechanically expanded into evenly spaced aluminum fins and cast iron headers, steel side plates and supports, factory air pressure tested at 100 psi under water, with means of adjusting pitch of element.
        2. Cabinet 0.0598 inch thick steel front and top, 0.0478 inch steel back and ends; exposed corners rounded; easily secured removable front panels, adequately braced and reinforced for stiffness.
        3. Finish: Factory applied baked **[primer coat] [enamel of <\_\_\_\_\_\_\_\_> color [as selected]]**.
        4. Damper: Where heating media is not thermostatically controlled, furnish knob-operated internal damper at enclosure air outlet.
        5. Access Doors: For otherwise inaccessible valves, furnish factory-made permanently hinged access doors, 6 x 7 inch minimum size, integral with cabinet.
        6. Capacity: As scheduled, based on 65 degrees F entering air temperature, **[180 degrees F average water temperature] [one psi steam]**.
      1. UNIT HEATERS

In this article, list manufacturers acceptable for this Project.

* + - * 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

INDEECO.

Markel Products; TPI Corporation.

Marley Engineered Products.

Ouellet Canada Inc.

Trane.

Approved equivalent.

Edit the following descriptive specifications to identify Project requirements and to eliminate conflicts with manufacturers specified above.

* + - * 1. Coils: Seamless copper tubing, 0.025 inch minimum wall thickness, silver brazed to steel headers, and with evenly spaced aluminum fins mechanically bonded to tubing.
        2. Casing: 0.0478-inch thick steel with threaded pipe connections for hanger rods.
        3. Finish: Factory applied baked **[primer coat] [enamel of <\_\_\_\_\_\_\_\_> color [as selected]]**.
        4. Fan: Direct drive propeller type, statically and dynamically balanced, with fan guard; horizontal models with permanently lubricated sleeve bearings; vertical models with grease lubricated ball bearings.
        5. Air Outlet: Adjustable pattern diffuser on projection models and **[two] [four]**-way louvers on horizontal throw models.
        6. Motor: Permanently lubricated sleeve bearings on horizontal models, grease lubricated ball bearings on vertical models. **[Refer to Section 230513.]**
        7. Control: Local **[multi-speed]** disconnect switch.
        8. Capacity: As scheduled, based on 65 degrees F entering air temperature, **[180 degrees F average water temperature] [one psi steam]**.
        9. Electrical Characteristics:

**<\_\_\_\_\_\_\_\_>** hp.

**<\_\_\_\_\_\_\_\_>** volts, **[single] [three]** phase, 60 Hz.

* + - 1. CABINET UNIT HEATERS

In this article, list manufacturers acceptable for this Project.

* + - * 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Airtherm; a Mestek company.

[Carrier Corporation](http://www.specagent.com/Lookup?uid=123457102682).

Engineered Air.

INDEECO.

[Markel Products; TPI Corporation](http://www.specagent.com/Lookup?uid=123457102694).

Marley Engineered Products.

Ouellet Canada Inc.

Rosemex Products.

Trane.

USA Coil & Air.

Approved equivalent.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

* + - * 1. Furnish materials in accordance with **[State] [Municipality]** of **<\_\_\_\_\_\_\_\_> [Highways] [Public Work's]** standards.

Edit the following descriptive specifications to identify Project requirements and to eliminate conflicts with manufacturers specified above.

* + - * 1. Coils: Evenly spaced aluminum fins mechanically bonded to copper tubes, designed for 100 psi and 220 degrees F.
        2. Cabinet: 0.0598 inch thick steel with exposed corners and edges rounded, easily removed panels, glass fiber insulation [and integral air outlet] [and integral air outlet and inlet grilles].
        3. Finish: Factory applied baked **[primer coat] [enamel of <\_\_\_\_\_\_\_\_> color [as selected]]** on visible surfaces of enclosure or cabinet.
        4. Fans: Centrifugal forward-curved double-width wheels, statically and dynamically balanced, direct driven.
        5. Motor: Tap wound multiple speed **[permanent split capacitor] [shaded pole]** with sleeve bearings, resiliently mounted.
        6. Control: Multiple speed switch, factory wired, located in cabinet.
        7. Filter: Easily removed 1 inch **[thick glass fiber throw-away] [permanent washable]** type, located to filter air before coil.
        8. Mixing Dampers: Where indicated, mixing sections with dampers.
        9. Capacity: As Scheduled, based on 65 degrees F entering air temperature, **[180 degrees F average water temperature] [one psig steam]**.
        10. Electrical Characteristics:

**<\_\_\_\_\_\_\_\_>** W.

**<\_\_\_\_\_\_\_\_>** volts, **[single] [three]** phase, 60 Hz.

* + - 1. FAN COIL UNITS

In this article, list manufacturers acceptable for this Project.

* + - * 1. [Manufacturers:](http://www.specagent.com/Lookup?ulid=9021) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Airtherm; a Mestek company.

Carrier Global Corporation.

Daikin Applied.

DRS Marlo Coil; part of DRS Technologies, Inc.

Dunham-Bush.

Engineered Air.

ENVIRO-TEC; brand of Johnson Controls International plc, Building Solutions North America.

First Company Products.

Greenheck Fan Corporation.

IEC (International Environmental Corporation); LSB Industries.

Nailor Industries Inc.

Rosemex Products.

Superior Rex.

Titus; brand of Johnson Controls International plc, Global Products.

Trane Inc.

USA Coil & Air.

YORK; brand of Johnson Controls International plc, Building Solutions North America.

Approved equivalent.

Edit the following descriptive specifications to identify Project requirements and to eliminate conflicts with manufacturers specified above.

* + - * 1. Coils: Evenly spaced aluminum fins mechanically bonded to copper tubes, designed for 200 psi and 220 degrees F. **[Furnish drain pan under cooling coil, easily removable for cleaning, with drain connection.]**
        2. Cabinet: 0.0598 inch thick steel with exposed corners and edges rounded, easily removed panels, glass fiber insulation **[and integral air outlet] [and integral air outlet and inlet grilles]**.
        3. Finish: Factory apply baked **[primer coat] [enamel of <\_\_\_\_\_\_\_\_> color [as selected]]** on visible surfaces of enclosure or cabinet.
        4. Fans: Centrifugal forward-curved double-width wheels, statically and dynamically balanced, direct driven.
        5. Motor: Tap wound multiple speed **[permanent split capacitor] [shaded pole]** with sleeve bearings, resiliently mounted.
        6. Control: Multiple speed switch, factory wired, located in cabinet.
        7. Filter: Easily removed 1 inch **[thick glass fiber throw-away] [permanent washable]** type, located to filter air before coil.
        8. Mixing Dampers: **[As indicated on Drawings,]** mixing sections with dampers.
        9. Capacity: **[As indicated on Drawings,]** based on 65 degrees F entering air temperature, **[180 degrees F average water temperature] [one psig steam]**.
        10. Electrical Characteristics:

**<\_\_\_\_\_\_\_\_>** W.

**<\_\_\_\_\_\_\_\_>** volts, **[single] [three]** phase, 60 Hz.

* + - 1. UNIT VENTILATORS

In this article, list manufacturers acceptable for this Project.

* + - * 1. [Manufacturers:](http://www.specagent.com/Lookup?ulid=3617) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Carrier Corporation.

Daikin Applied.

Engineered Air.

Nesbitt Aire, Inc.

Trane.

Approved equivalent.

Edit the following descriptive specifications to identify Project requirements and to eliminate conflicts with manufacturers specified above.

* + - * 1. Coils:

Type: **[Chilled water cooling] [DX cooling] [Hot water heating] [Steam heating]**.

Copper tubes mechanically expanded into evenly spaced aluminum fins tested to operate at 150 psig. **[Furnish drain pan under cooling coil, easily removable for cleaning, with drain connection.]**

* + - * 1. Electric Heating Coil: **[Enclosed copper tube, aluminum finned element of coiled nickel-chrome resistance wire centered in tubes and embedded in refractory material.] [Exposed helical coil of nickel-chrome resistance wire with refractory ceramic support bushings.]**
        2. Cabinet: 0.0747-inch thick steel on solid base pan with exposed edges rounded. Furnish removable front panels with quick-acting, key-operated cam locks. Furnish removable die-cast or fabricated steel discharge grilles. **[For units having cooling coils, insulate internal parts and surfaces exposed to conditioned air stream with moisture resistant insulation.]**
        3. Cabinet Accessories: Matching steel construction, reinforced, for use with unit ventilators or finned radiation, with steel alignment pins, adjustable kick plates with leveling bolts, shelves and sliding doors [with locks] as indicated on Drawings, **[sinks,] [bubbler faucets and bowls,]** corner, end, and wall filler sections **[as indicated on Drawings]**.
        4. Finish: Factory apply baked **[primer coat] [enamel of <\_\_\_\_\_\_\_\_> color [as selected]]** on visible surfaces of enclosure or cabinet.
        5. Fans: Centrifugal forward-curved double-width wheels, statically and dynamically balanced, direct driven, arranged to draw air through coil.
        6. Wall Louvers: **[Anodized aluminum] [Galvanized steel]** wall intake box and louvers removable from frame with 1/2 inch square mesh galvanized screen in back of louver.
        7. Motor: Tap wound multiple speed **[permanent split capacitor] [shaded pole]** with sleeve bearings, resiliently mounted.
        8. Air Cooled Condensing Unit: Corrosion resistant cabinet, with hermetically sealed compressor with internal spring isolation, external isolation, permanent split capacitor motor and overload protection, copper tube aluminum fin condenser coil, direct drive propeller fan with **[permanently lubricated ball bearing]** single phase motor with internal overload protection.
        9. Control: Multiple speed switch, factory wired, located in cabinet.
        10. Filter: Easily removed 1 inch **[thick glass fiber throw-away] [permanent washable]** type, located to filter air before coil.
        11. Mixing Dampers: Multi-blade with compressible seal, capable of varying proportion of mixed air from 100 percent room air to 100 percent outside air.
        12. Heating Capacity: As indicated on Drawings, based on 65 degrees F entering air temperature, **[180 degrees F average water temperature] [one psig steam]**.
        13. Electrical Characteristics:

**<\_\_\_\_\_\_\_\_>** kW.

**<\_\_\_\_\_\_\_\_>** volts, **[single] [three]** phase, 60 Hz.

* + - 1. HYDRONIC RADIANT HEATERS

In this article, list manufacturers acceptable for this Project.

* + - * 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Haydon Corporation.

Rosemex Products.

Slant/Fin Corp.

Sterling HVAC Products; a Mestek company.

Approved equivalent.

Edit the following descriptive specifications to identify Project requirements and to eliminate conflicts with manufacturers specified above.

* + - * 1. Ceiling Panels: Constructed of modular [[5 inch] [6 inch] wide aluminum extrusions with interlocking edges;] [24 x 48 inch aluminum pans with silk-screened pattern matching ceiling tile;] manufactured and assembled to sizes and configurations indicated.
        2. Pipe Coil: **[[5 inch] [6 inch] module to incorporate extruded void into continuous 1/2 inch copper pipe is rolled and thermally bonded.] [24 x 48 inch aluminum pan module to incorporate continuous 1/2 inch copper pipe thermally bonded.]** Furnish return bends for two water connections to each panel.
        3. **[As indicated on Drawings,]** furnish panels incorporating extruded drapery track.
        4. Cross brace entire assembly with structural members and insulate with 1 inch thick fiberglass insulation. Configure panels within T-bar ceiling module and run wall to wall.
        5. Heating Capacity: As scheduled, based on 180 degrees F average water temperature, 70 degrees F space temperature.
      1. INDUCTION UNITS

In this article, list manufacturers acceptable for this Project.

* + - * 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

EB Air Control

LTG Air Tech Systems

Price Industries

Approved equivalent.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

* + - * 1. Furnish materials in accordance with **[State] [Municipality]** of **<\_\_\_\_\_\_\_\_> [Highways] [Public Work's]** standards.

Edit the following descriptive specifications to identify Project requirements and to eliminate conflicts with manufacturers specified above.

* + - * 1. Configuration: **[Low vertical] [Vertical]** unit, primary air plenum with primary air inlet, air balancing damper, **[multi-stage]** nozzles, **[primary air reheat coil,]** secondary air inlet, **[secondary cooling coil and galvanized drain pan,] [secondary heating coil,]** and discharge stack.

Select enclosure thickness. Use 0.0478 inch for height 18 inches and under and 0.0598 inch for over 18 inches.

* + - * 1. Cabinet Enclosures:

**[0.0478 inch] [0.0598-inch]** thick prime coated steel.

Fabricate cabinet enclosures complete with mounting channels, end trim pieces, mullion spacers, removable front panels, and removable discharge grills.

Furnish enclosures to cover induction units continuously column to column, or wall to wall.

* + - * 1. Discharge Grills: **[Plastic] [Cast metal] [Stamped steel]**.
        2. Primary Air Plenum: Constructed of **[21 gage]** thick **[24 gage]** thick galvanized steel. Insulated with **[1/2 inch] [3/8 inch]** thick, **[2-1/2 lb./cu ft] [4 lb./cu ft]** density neoprene coated glass fiber insulation.
        3. Base Unit Casing:

0.0396 inch thick galvanized steel.

Include acoustically insulated primary air plenum, primary air inlets, internal air damper, induction nozzles, water coil, lint screen, and drain pan in base units.

Furnish interchangeable transition pieces or plugs for single or series hook up.

Spot weld and seal joints in base unit.

Paint portion of unit visible through discharge opening with flat black enamel.

Furnish internal primary air damper of multiple orifice design manually adjustable from under discharge grill.

* + - * 1. Nozzles: Heat-resistant plastic suitable for temperatures from 20 degrees F to 200 degrees F with 3.5 wg nozzle pressure.
        2. Water Coil: One row, 1/2 inch OD copper tubing with aluminum fins.
        3. **[Drainable] [Non-Drainable]** Drain Pan: 0.0396 minimum galvanized steel.
        4. Lint Screens: Aluminum mesh.
        5. Performance:

Overall Performance: **<\_\_\_\_\_\_\_\_>** Btu/hr sensible cooling, **<\_\_\_\_\_\_\_\_>** Btu/hr total cooling, **<\_\_\_\_\_\_\_\_>** degrees F room design temperature.

Primary Air: **<\_\_\_\_\_\_\_\_>** cfm at **<\_\_\_\_\_\_\_\_>** degrees F, with nozzle series **<\_\_\_\_\_\_\_\_>** at **<\_\_\_\_\_\_\_\_>** inches wg static pressure.

Reheat Coil: **<\_\_\_\_\_\_\_\_>** Btu/hr heating, with **<\_\_\_\_\_\_\_\_>** gpm heating water at **<\_\_\_\_\_\_\_\_>** degrees F.

Secondary Cooling Coil: **<\_\_\_\_\_\_\_\_>** Btu/hr cooling, with **<\_\_\_\_\_\_\_\_>** gpm cooling water at **<\_\_\_\_\_\_\_\_>** degrees F.

Secondary Heating Coil: **<\_\_\_\_\_\_\_\_>** Btu/hr heating, with **<\_\_\_\_\_\_\_\_>** gpm heating water at **<\_\_\_\_\_\_\_\_>** degrees F.

Gravity Heating Capacity: **<\_\_\_\_\_\_\_\_>** Btu/hr heating, with **<\_\_\_\_\_\_\_\_>** gpm heating water at **<\_\_\_\_\_\_\_\_>** degrees F.

Noise Criteria: NC- **<\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.>**

* + - 1. ELECTRIC RADIANT HEATERS

In this article, list manufacturers acceptable for this Project.

* + - * 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Quincy Hydronic Technology Inc.

Runtal North America, Inc.

Approved equivalent.

Edit the following descriptive specifications to identify Project requirements and to eliminate conflicts with manufacturers specified above.

* + - * 1. Assembly: UL listed and labeled, with thermal box and cover, and [built-in] controls.
        2. Heating Elements: Enclosed copper tube element of coiled nickel-chrome resistance wire centered in tubes and embedded in refractory material, [in metal reflective cabinet] [bonded to ceiling panel].
        3. Ceiling Panels: 24 x 48 inch aluminum pans with silk-screened pattern matching ceiling tile; manufactured and assembled to configuration indicated.
        4. Electrical Characteristics:

**<\_\_\_\_\_\_\_\_>** kW.

**<\_\_\_\_\_\_\_\_>** volts, **[single] [three]** phase, 60 Hz.

* + - 1. ELECTRIC BASEBOARD

In this article, list manufacturers acceptable for this Project.

* + - * 1. [Manufacturers:](http://www.specagent.com/Lookup?ulid=7086) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

INDEECO.

Markel Products; TPI Corporation.

Marley Engineered Products.

Ouellet Canada Inc.

Approved equivalent.

Edit the following descriptive specifications to identify Project requirements and to eliminate conflicts with manufacturers specified above.

* + - * 1. Assembly: UL listed and labeled with terminal box and cover, and **[built-in]** controls.
        2. Heating Elements: Enclosed copper tube, aluminum finned element of coiled nickel-chrome resistance wire centered in tubes and embedded in refractory material.
        3. Enclosure: Minimum 0.030 inch thick steel with **[7 inch] [10 inch] [<\_\_\_\_\_\_\_\_> inch]** high back and top of one piece; front panel, end panel, end caps, corners, and joiner pieces to snap together, and front panel easily removable. Furnish full-length damper.
        4. Control: **[Built-in bi-metal heating thermostat, factory wired.] [Wall mounted electric thermostat.]**

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

* + - * 1. Control: Electronic control system with **[baseboard] [remote]** mounted power module, **[baseboard mounted electronic thermostat.] [wall mounted [programmable] electronic thermostat [with five day and two day programming, and battery back up].]**
        2. Electrical Characteristics:

**<\_\_\_\_\_\_\_\_>** kW.

**<\_\_\_\_\_\_\_\_>** volts, **[single] [three]** phase, 60 Hz.

* + - 1. ELECTRIC UNIT HEATERS

In this article, list manufacturers acceptable for this Project.

* + - * 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

INDEECO.

Markel Products; TPI Corporation.

Marley Engineered Products.

Ouellet Canada Inc.

Trane.

Approved equivalent.

Edit the following descriptive specifications to identify Project requirements and to eliminate conflicts with manufacturers specified above.

* + - * 1. Assembly: UL listed and labeled assembly with terminal box and cover, and **[built-in]** controls.
        2. Heating Elements: **[Enclosed copper tube, aluminum finned element of coiled nickel-chrome resistance wire centered in tubes and embedded in refractory material]. [Exposed helical coil of nickel-chrome resistance wire with refractory ceramic support bushings]**.
        3. Cabinet: 0.0478-inch thick steel with easily removed front panel with integral air outlet and inlet grilles.
        4. Element Hangers: Quiet operating, ball bearing cradle type providing unrestricted longitudinal movement, on enclosure brackets.
        5. Fan: Direct-drive propeller type, statically and dynamically balanced, with fan guard.
        6. Motor: Permanently lubricated, sleeve bearings for horizontal models; ball bearings for vertical models.
        7. Control: Separate fan speed switch and thermostat heat selector switch, factory wired, with switches built-in behind cover. Furnish thermal overload.
        8. Electrical Characteristics:

**<\_\_\_\_\_\_\_\_>** kW.

**<\_\_\_\_\_\_\_\_>** volts, **[single] [three]** phase, 60 Hz.

Disconnect Switch: Factory mount.

1. EXECUTION
   * + 1. EXAMINATION
          1. Section 013000 - Administrative Requirements: Coordination and project conditions.
          2. For recessed units, verify recess dimensions are correct size.
          3. Verify wall construction is ready for installation.
          4. Verify ductwork is ready for installation.
          5. Verify concealed blocking and supports are in place and connections are correctly located.
       2. INSTALLATION
          1. Install air coils in ducts and casings in accordance with SMACNA HVAC Duct Construction Standards, Metal and Flexible. Refer to Section 233100.
          2. Support air coil sections independent of piping on steel channel or double angle frames and secure to casings. Furnish frames for maximum three coil sections. Arrange supports to avoid piercing drain pans. Install with airtight seal between coil and duct or casing.
          3. Protect coils to prevent damage to fins and flanges. Comb out bent fins.
          4. Install coils level. **[Install cleanable tube fluid coils and level frame steam coils with 1: 50 pitch.]**
          5. Make connections to coils with unions and flanges.
          6. On water coils, install shut-off valve on supply piping and lockshield balancing valve on return piping. Locate water supply at bottom of supply header and return water connection at top. Install **[manual] [float operated automatic]** air vents at high points complete with stop valve. Install water coils to be drainable and install drain connection at low points. Refer to Section 232113.
          7. On water **[and glycol]** heating coils, and chilled water cooling coils, connect water supply piping to leaving airside of coil (counter flow arrangement). Refer to Section 232113.
          8. For cooling coils where air velocity exceeds **[500] [550] <\_\_\_\_\_\_\_\_>** ft/min, install **[three break] [six break]** moisture eliminators of 24 gage galvanized steel.
          9. Install insulation air coil casings. Refer to Section 230700.
          10. Install drain pan and drain piping connection for cooling coils. Fabricate drain pan from 20 gage galvanized steel. Extend 3 inches from face of coil entering air side, **[6] <\_\_\_\_\_\_\_\_>** inches from face of coil leaving air side **[,] [.] [and 4 inches from face of eliminators.]** Pipe drain pans individually to floor drain **[.] [with water seal trap.]** Refer to Section 232113.
          11. In steam coils, install vacuum breaker in steam piping at or in header. Install steam traps with outlet minimum 12 inches below coil return connection. Refer to Section 232216 and Section 232213.
          12. On refrigerant coils, install sight glass in liquid piping within 12 inches of coil. Refer to Section 232300.
          13. Insulate headers located outside airflow, insulate as specified for piping. Refer to Section 230700.
          14. Wire electric duct coils.
          15. Install equipment exposed to finished areas after walls and ceilings are finished and painted. Avoid damage.
          16. Protection: Install finished cabinet units with protective covers during remainder of construction.
          17. Baseboard Radiation: Locate on outside walls and run cover continuously wall-to-wall unless otherwise indicated. Center elements under windows. **[Where multiple windows occur over units, divide element into equal segments centered under each window.]** Install end caps where units butt against walls.
          18. Finned Tube Radiation: Locate on outside walls and run cover wall-to-wall unless otherwise indicated. Center elements under windows. **[Where multiple windows occur over units, divide element into equal segments centered under each window.] [Align cabinet joints with window mullions.]** Install wall angles where units butt against walls.
          19. Convectors: **[Install at locations as indicated on Drawings.]** Coordinate to assure correct recess size for recessed convectors.
          20. Unit Heaters: Hang from building structure, with pipe hangers anchored to building, not from piping. Mount as high as possible to maintain greatest headroom unless otherwise indicated.
          21. Cabinet Unit Heaters: **[Install at locations as indicated on Drawings.]** Coordinate to assure correct recess size for recessed units.
          22. Fan-Coil Units: **[Install at locations as indicated on Drawings.]** Coordinate to assure correct recess size for recessed units.
          23. Unit Ventilators: **[Install at locations as indicated on Drawings.]** Install level and shim units, and anchor to structure. Coordinate exact location of wall louvers. **[Install shelving and auxiliary cabinetry.] [Install wall trim pieces for continuous wall-to-wall installation.]**
          24. Induction Units: **[Install at locations as indicated on Drawings.]** Support base units from continuous wall mounting strip or wall mounting brackets. Support cabinet enclosures from wall mounting strip or attach direct to wall and floor.
          25. Hydronic Units: Install with shut-off valve on supply piping and lockshield balancing valve on return piping. Where not accessible, extend vent to exterior surface of cabinet for servicing. For cabinet unit heaters, fan coil units, and unit heaters, install float operated automatic air vents with stop valve. Refer to Section 232113.
          26. Units with Cooling Coils: Install drain piping to **[condensate drain]** <\_\_\_\_\_\_\_\_>. Refer to Section 232113.
          27. Install electric heating equipment including devices furnished by manufacturer but not factory-mounted. Furnish copy of manufacturer's wiring diagram submittal. Install electrical wiring in accordance with manufacturer's submittals.
       3. CLEANING
          1. Section 017000 - Execution and Closeout Requirements: Final cleaning.
          2. After construction is completed, including painting, clean exposed surfaces of units. Vacuum clean coils and inside of cabinets.
          3. Touch-up marred or scratched surfaces of factory-finished cabinets, using finish materials furnished by manufacturer.
          4. Install new filters.
       4. SCHEDULES

Include schedule when sizes are unique and many sizes are needed to meet Project requirements. Complete in conjunction with identification method used on Drawings or include schedule on Drawings. No units of measurement are indicated; add to schedule legend or include within each insert.

Consider the following examples when developing Project schedule.

* + - * 1. Air Coils Schedule:

C-1:

**[Manufacturer: <\_\_\_\_\_\_\_\_>.]**

**[Model: <\_\_\_\_\_\_\_\_>.]**

Location: **<\_\_\_\_\_\_\_\_>**.

Service: **<\_\_\_\_\_\_\_\_>**.

Number: **<\_\_\_\_\_\_\_\_>**.

Construction: **<\_\_\_\_\_\_\_\_>**.

Type: **<\_\_\_\_\_\_\_\_>**.

Width: **<\_\_\_\_\_\_\_\_>**.

Height: **<\_\_\_\_\_\_\_\_>**.

Face Area: **<\_\_\_\_\_\_\_\_>**.

Rows: **<\_\_\_\_\_\_\_\_>**.

Circuits: **<\_\_\_\_\_\_\_\_>**.

Air Flow Rate: **<\_\_\_\_\_\_\_\_>**.

Velocity: **<\_\_\_\_\_\_\_\_>**.

Static Pressure Drop: **<\_\_\_\_\_\_\_\_>**.

Heat Transfer Rate: **<\_\_\_\_\_\_\_\_>**.

Entering Dry Bulb Temperature: **<\_\_\_\_\_\_\_\_>**.

Entering Wet Bulb Temperature: **<\_\_\_\_\_\_\_\_>**.

Leaving Dry Bulb Temperature: **<\_\_\_\_\_\_\_\_>**.

Leaving Wet Bulb Temperature: **<\_\_\_\_\_\_\_\_>**.

Water Flow Rate: **<\_\_\_\_\_\_\_\_>**.

Velocity: **<\_\_\_\_\_\_\_\_>**.

Head Loss: **<\_\_\_\_\_\_\_\_>**.

Refrigerant: **<\_\_\_\_\_\_\_\_>**.

Saturated Suction Temperature: **<\_\_\_\_\_\_\_\_>**.

Electric Input (kW): **<\_\_\_\_\_\_\_\_>**.

C-2:

**[Manufacturer: <\_\_\_\_\_\_\_\_>.]**

**[Model: <\_\_\_\_\_\_\_\_>.]**

Location: **<\_\_\_\_\_\_\_\_>**.

Service: **<\_\_\_\_\_\_\_\_>**.

Number: **<\_\_\_\_\_\_\_\_>**.

Construction: **<\_\_\_\_\_\_\_\_>**.

Type: **<\_\_\_\_\_\_\_\_>**.

Width: **<\_\_\_\_\_\_\_\_>**.

Height: **<\_\_\_\_\_\_\_\_>**.

Face Area: **<\_\_\_\_\_\_\_\_>**.

Rows: **<\_\_\_\_\_\_\_\_>**.

Circuits: **<\_\_\_\_\_\_\_\_>**.

Air Flow Rate: **<\_\_\_\_\_\_\_\_>**.

Velocity: **<\_\_\_\_\_\_\_\_>**.

Static Pressure Drop: **<\_\_\_\_\_\_\_\_>**.

Heat Transfer Rate: **<\_\_\_\_\_\_\_\_>**.

Entering Dry Bulb Temperature: **<\_\_\_\_\_\_\_\_>**.

Entering Wet Bulb Temperature: **<\_\_\_\_\_\_\_\_>**.

Leaving Dry Bulb Temperature: **<\_\_\_\_\_\_\_\_>**.

Leaving Wet Bulb Temperature: **<\_\_\_\_\_\_\_\_>**.

Water Flow Rate: **<\_\_\_\_\_\_\_\_>**.

Velocity**: <\_\_\_\_\_\_\_\_>.**

Head Loss: **<\_\_\_\_\_\_\_\_>**.

Refrigerant: **<\_\_\_\_\_\_\_\_>**.

Saturated Suction Temperature: **<\_\_\_\_\_\_\_\_>**.

Electric Input (kW): **<\_\_\_\_\_\_\_\_>.**

* + - * 1. Radiators Schedule:

RAD-1:

**[Manufacturer: <\_\_\_\_\_\_\_\_>.]**

**[Model: <\_\_\_\_\_\_\_\_>.]**

Location: **<\_\_\_\_\_\_\_\_>**.

Fin Type: **<\_\_\_\_\_\_\_\_>**.

Enclosure Type: **<\_\_\_\_\_\_\_\_>**.

Rows: **<\_\_\_\_\_\_\_\_>**.

Heat Output: **<\_\_\_\_\_\_\_\_>**.

RAD-2:

**[Manufacturer: <\_\_\_\_\_\_\_\_>.]**

**[Model: <\_\_\_\_\_\_\_\_>.]**

Location: <\_\_\_\_\_\_\_\_>.

Fin Type: **<\_\_\_\_\_\_\_\_>**.

Enclosure Type: **<\_\_\_\_\_\_\_\_>**.

Rows: **<\_\_\_\_\_\_\_\_>**.

Heat Output: **<\_\_\_\_\_\_\_\_>**.

* + - * 1. Convectors Schedule:

CON-1:

**[Manufacturer: <\_\_\_\_\_\_\_\_>.]**

**[Model: <\_\_\_\_\_\_\_\_>.]**

Location: **<\_\_\_\_\_\_\_\_>**.

Enclosure Type: **<\_\_\_\_\_\_\_\_>**.

Enclosure Size: **<\_\_\_\_\_\_\_\_>**.

Heat Output: **<\_\_\_\_\_\_\_\_>**.

CON-2:

**[Manufacturer: <\_\_\_\_\_\_\_\_>.]**

**[Model: <\_\_\_\_\_\_\_\_>.]**

Location: **<\_\_\_\_\_\_\_\_>**.

Enclosure Type: **<\_\_\_\_\_\_\_\_>**.

Enclosure Size: **<\_\_\_\_\_\_\_\_>**.

Heat Output: **<\_\_\_\_\_\_\_\_>**.

* + - * 1. Unit Heaters Schedule:

UH-1:

**[Manufacturer: <\_\_\_\_\_\_\_\_>.]**

**[Model: <\_\_\_\_\_\_\_\_>.]**

Location: **<\_\_\_\_\_\_\_\_>**.

Heat Output: **<\_\_\_\_\_\_\_\_>**.

Water Flow Rate: **<\_\_\_\_\_\_\_\_>**.

Motor : **<\_\_\_\_\_\_\_\_>**.

Power: **<\_\_\_\_\_\_\_\_>**.

Voltage/Phase: **<\_\_\_\_\_\_\_\_>/<\_\_\_\_\_\_\_\_>**.

UH-1:

**[Manufacturer: <\_\_\_\_\_\_\_\_>.]**

**[Model: <\_\_\_\_\_\_\_\_>.]**

Location: **<\_\_\_\_\_\_\_\_>**.

Heat Output: **<\_\_\_\_\_\_\_\_>**.

Water Flow Rate: **<\_\_\_\_\_\_\_\_>**.

Motor : **<\_\_\_\_\_\_\_\_>**.

Power: **<\_\_\_\_\_\_\_\_>**.

Voltage/Phase: **<\_\_\_\_\_\_\_\_>/<\_\_\_\_\_\_\_\_>**.

* + - * 1. Cabinet Unit Heaters Schedule:

CUH-1:

**[Manufacturer: <\_\_\_\_\_\_\_\_>.]**

**[Model: <\_\_\_\_\_\_\_\_>.]**

Location: **<\_\_\_\_\_\_\_\_>**.

Arrangement: **<\_\_\_\_\_\_\_\_>**.

Heat Output: **<\_\_\_\_\_\_\_\_>**.

Water Flow Rate: **<\_\_\_\_\_\_\_\_>**.

Motor: **<\_\_\_\_\_\_\_\_>**.

Power: **<\_\_\_\_\_\_\_\_>**.

Voltage/Phase: **<\_\_\_\_\_\_\_\_>/<\_\_\_\_\_\_\_\_>**.

* + - * 1. **[Fan Coil Units] [Unit Ventilators]** Schedule:

UV-1:

**[Manufacturer: <\_\_\_\_\_\_\_\_>.]**

**[Model: <\_\_\_\_\_\_\_\_>.]**

Location: **<\_\_\_\_\_\_\_\_>**.

Supply Fan:

Air Flow Rate: **<\_\_\_\_\_\_\_\_>**.

Static Pressure: **<\_\_\_\_\_\_\_\_>**.

Motor: **<\_\_\_\_\_\_\_\_>**.

Power: **<\_\_\_\_\_\_\_\_>**.

Voltage/Phase: **<\_\_\_\_\_\_\_\_>/<\_\_\_\_\_\_\_\_>**.

Cooling:

Sensible: **<\_\_\_\_\_\_\_\_>**.

Total: **<\_\_\_\_\_\_\_\_>**.

Entering Dry Bulb Temperature: **<\_\_\_\_\_\_\_\_>**.

Entering Wet Bulb Temperature: **<\_\_\_\_\_\_\_\_>**.

Leaving Dry Bulb Temperature: **<\_\_\_\_\_\_\_\_>**.

Leaving Wet Bulb Temperature: **<\_\_\_\_\_\_\_\_>**.

Nominal Capacity: **<\_\_\_\_\_\_\_\_>**.

UV-2:

**[Manufacturer: <\_\_\_\_\_\_\_\_>.]**

**[Model: <\_\_\_\_\_\_\_\_>.]**

Location: **<\_\_\_\_\_\_\_\_>**.

Supply Fan:

Air Flow Rate: **<\_\_\_\_\_\_\_\_>**.

Static Pressure: **<\_\_\_\_\_\_\_\_>**.

Motor: **<\_\_\_\_\_\_\_\_>**.

Power: **<\_\_\_\_\_\_\_\_>**.

Voltage/Phase: **<\_\_\_\_\_\_\_\_>/<\_\_\_\_\_\_\_\_>**.

Cooling:

Sensible: **<\_\_\_\_\_\_\_\_>**.

Total: **<\_\_\_\_\_\_\_\_>**.

Entering Dry Bulb Temperature: **<\_\_\_\_\_\_\_\_>**.

Entering Wet Bulb Temperature: **<\_\_\_\_\_\_\_\_>**.

Leaving Dry Bulb Temperature: **<\_\_\_\_\_\_\_\_>**.

Leaving Wet Bulb Temperature: **<\_\_\_\_\_\_\_\_>**.

Nominal Capacity: **<\_\_\_\_\_\_\_\_>**.

* + - * 1. Electric **[Baseboard] [Unit]** Heaters Schedule:

EH-1:

**[Manufacturer: <\_\_\_\_\_\_\_\_>.]**

**[Model: <\_\_\_\_\_\_\_\_>.]**

Location: **<\_\_\_\_\_\_\_\_>**.

Heat Output: **<\_\_\_\_\_\_\_\_>**.

Power Input: **<\_\_\_\_\_\_\_\_>**.

Motor: **<\_\_\_\_\_\_\_\_>**.

Power: **<\_\_\_\_\_\_\_\_>**.

Voltage/Phase: **<\_\_\_\_\_\_\_\_>/<\_\_\_\_\_\_\_\_>**.

EH-2:

**[Manufacturer: <\_\_\_\_\_\_\_\_>.]**

**[Model: <\_\_\_\_\_\_\_\_>.]**

Location: **<\_\_\_\_\_\_\_\_>**.

Heat Output: **<\_\_\_\_\_\_\_\_>**.

Power Input: **<\_\_\_\_\_\_\_\_>**.

Motor: **<\_\_\_\_\_\_\_\_>**.

Power: **<\_\_\_\_\_\_\_\_>**.

Voltage/Phase: **<\_\_\_\_\_\_\_\_>/<\_\_\_\_\_\_\_\_>**.

END OF SECTION 238200