

SECTION 15760  
TERMINAL UNITS

PART 1 - GENERAL

1.01 PROVISIONS INCLUDED

- A. The general provisions of the Contract, including General and Supplementary General Conditions, and Division 1 General Requirements, apply to work specified in this Section.
- B. Requirements of Section 15050, "Basic Mechanical Materials and Methods," apply to this Section.

1.02 SUMMARY

- A. Extent of terminal unit work is indicated by drawings and schedules, and by requirements of this section.
  - 1. Provide the following electrical work as work of this section, complying with requirements of Division-16 sections:
    - a. Interlock wiring specified as factory-installed.
    - b. Control wiring between field-installed controls, indicating devices, and terminal unit control panels.
- B. Types of terminal units required for project include the following:
  - 1. Finned tube radiation.
  - 2. Coils.
  - 3. Radiant Ceiling Panels.

1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's specifications for terminal units showing dimensions, capacities, ratings, performance characteristics, gages and finishes of materials, and installation instructions.
- B. Shop Drawings: Submit assembly-type shop drawings showing unit dimensions, construction details, and field connection details.
- C. Wiring Diagrams: Submit manufacturer's electrical requirements for power supply wiring to terminal units. Submit manufacturer's ladder-type wiring diagrams for interlock and control wiring. Clearly differentiate between portions of wiring that are factory-installed and portions to be field-installed.
- D. Samples: Submit 3 samples of each type of cabinet finish furnished.
- E. Maintenance Data: Submit maintenance instructions, including lubrication instructions, filter replacement, motor and drive replacement, and spare parts lists. Include this data, product data, shop drawings in maintenance manuals; in accordance with requirements of Division 1.

#### 1.04 QUALITY ASSURANCE

- A. Manufacturer's Qualifications: Firms regularly engaged in manufacture of terminal units, of types and sizes required, whose products have been in satisfactory use in similar service for not less than 3 years.
- B. Codes and Standards:
  - 1. Test and rate finned tube radiation in accordance with I=B=R, provide published ratings bearing emblem of I=B=R.
  - 2. Provide coil ratings in accordance with ARI Standard 410 "Forced-Circulation Air-Cooling and Air-Heating Coils".
  - 3. Test coils in accordance with ASHRAE Standard 33 "Methods of Testing Forced Circulation Air Cooling and Heating Coils".
  - 4. Provide electrical components for terminal units which have been listed and labeled by UL.

#### 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Handle terminal units and components carefully to prevent damage, breaking, denting and scoring. Do not install damaged terminal units or components; replace with new.
- B. Store terminal units and components in clean dry place. Protect from weather, dirt, fumes, water, construction debris, and physical damage.
- C. Comply with Manufacturer's rigging and installation instructions for unloading terminal units, and moving them to final location.

#### 1.06 EXTRA MATERIALS

- A. Furnish one additional complete set of belts for each belt driven terminal unit.

### PART 2 - PRODUCTS

#### 2.01 MANUFACTURERS

- A. Subject to compliance with requirements, provide products of one of the following:
  - 1. Finned tube radiation
    - a. Dunham-Bush, Inc.
    - b. Runtal Corp.
    - c. Slant/Fin Corp.
    - d. Sterling Radiator; Div. of Reed National Corp.
    - e. Trane (The) Co.
    - f. Vulcan Radiator Co.
  - 2. Hydronic Radiant Ceiling Panels:
    - a. Sterling
    - b. Rosemex
    - c. Aero Tech Manufacturing Inc.
    - d. Sun-El
  - 3. Coils:

- a. Aerofin Corp.
- b. US Corp.
- c. Trane (The) Co.

## 2.02 FINNED TUBE RADIATION

- A. General: Provide finned tube radiation of lengths and in locations as indicated, and of capacities, style, and having accessories as scheduled.
- B. Elements: Copper tube and aluminum fins, with tube mechanically expanded into fin collars to eliminate noise and insure durability and performance at scheduled ratings.
- D. Finish: Flat black heat resisting paint for backplate; factory finished baked enamel, standard colors, on fronts and accessories.

## 2.03 COILS:

- A. General: Provide coils of size and in location indicated, and of capacities and having performance data as scheduled. Certify coil capacities, pressure drops, and selection procedures in accordance with ARI 410.
- B. Heating Coils:
  - 1. Fins: Construct of continuous aluminum or copper configured plate-fin type with full fin collars for accurate spacing and maximum fin-tube contact.
  - 2. Tubes: Construct of 0.025" copper tubing, expanded into fin collars for permanent fin-tube bond and expanded into header for permanent leaktight joint.
  - 3. Headers: Construct of gray cast iron for coils 33" high and smaller. Hydrostatically test to 400 psi before assembly. Construct of round seamless copper tube for coils over 33" high.
  - 4. Casings: Construct of 16-ga continuous coated galvanized steel with fins recessed into channels to minimize air bypass.
  - 5. Testing: Proof test coils at 300 psi, leak test at 200 psi under water.
  - 6. Coil Types: Provide the coil types as indicated, and as scheduled.

## 2.04 HYDRONIC RADIANT CEILING PANELS:

- A. General: Provide linear ceiling radiant heating panels in locations as indicated, and of capacities, style and having accessories as scheduled.
- B. Panels: Extruded aluminum with a minimum of 0.100" thickness.
- C. Coils: 0.500" I.D. copper tube.
- D. Insulation: 1" thick, ¾ pound per cubic foot density fiberglass, field applied to cover top of entire panel. All edges shall be taped so that none of the fiberglass will be exposed to the ceiling plenum.
- E. Finish: Apply two coats baked enamel paint only to the finished side of panels after assembly. Paint on plenum side of panels not acceptable. Provide custom color as selected by Architect.

- F. Accessories; include the following:
  - 1. Galvanized, soft-annealed steel, 12 gauge suspension wire.
  - 2. Wall moldings for support at exterior walls.

### PART 3 - EXECUTION

#### 3.01 EXAMINATION

- A. Examine areas and conditions under which terminal units are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

#### 3.02 INSTALLATION OF FINNED TUBE RADIATION

- A. General: Install finned tube radiation as indicated, and in accordance with manufacturer's installation instructions.
- B. Locate finned tube radiation on outside walls as indicated.
- C. Center elements under windows. Where multiple windows occur over units, divide elements into equal segments centered under each window.

#### 3.03 INSTALLATION OF COILS

- A. General: Install coils as indicated, and in accordance with manufacturer's installation instructions.
- B. Mount coils on steel supports to form banks or stacks as indicated, brace, secure to air intake chamber. Place in location to permit installation of bypass damper if required, provide steel baffles where required to prevent bypassing of air
- C. Pitch coil casings for drainage, not less than 1/8" toward return connections, except where drainage feature is included in coil design.
- D. Provide for each bank of cooling coils, stainless steel drain pan under each coil supported off of floor of sufficient height to allow installation of condensate trap to allow drainage of condensate from pan when installed on suction side of fan.
- E. Provide for each steam coil unit, steam supply connection with strainer, gate valve, automatic temperature regulating valve, condensate return connection with vacuum breaker, f&t trap, and gate valve, as indicated.
- F. Provide for each hot or chilled water coil unit, water supply, return connection, strainer, gate valves, automatic temperature regulating valve, balancing cocks, as indicated.

#### 3.04 HYDRONIC RADIANT CEILING PANEL INSTALLATION

- A. Install panels as indicated and in accordance with manufacturer's written instructions.

- B. Install hangers and supports as required for radiant panels only. All adjacent ceiling materials including perimeter wall mounting and ceiling tees by ceiling contractor.
- C. Pressure test radiant panel circuits at 150 psig for two hours after installation.
- D. Install insulation after completion of pressure test.

3.05 ELECTRICAL WIRING

- A. General: Install electrical devices furnished by manufacturer but not specified to be factory-mounted. Furnish copy of manufacturer's wiring diagram submittal to Electric Installer.
- B. Verify that electrical wiring installation is in accordance with manufacturer's submittal and installation requirements of Division-16 sections. Do not proceed with equipment start-up until wiring installation is acceptable to equipment installer.

3.06 DEMONSTRATION

- A. Owner's Instructions: Provide services for manufacturer's technical representative for training personnel in proper operating and maintenance procedures. Provide four training sessions at the site, each session of 4 hours duration with 2 sessions performed on off shift
  1. Schedule training with Owner, provide at least 7-day notice to Contractor and Architect of training date.

3.07 ADJUSTING AND CLEANING

- A. General: After construction is completed, including painting, clean unit exposed surfaces, vacuum clean terminal coils and inside of cabinets.
- B. Retouch any marred or scratched surfaces of factory-finished cabinets, using finish materials furnished by manufacturer.

END OF SECTION 15760