SECTION 15817
ELECTRIC RESISTANCE DUCT HEATERS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. The other Contract Documents complement the requirements of this section.
B. The General Requirements apply to the work of this section.

1.2 SCOPE

A. Provide material, equipment, labor and supervision necessary to electric resistance heaters in the duct system as required.

1.3 QUALIFICATIONS

A. Duct heating coils shall be Brasch, Indeeco, Markel or Warren.

1.4 SUBMITTALS

A. Submittal data shall consist of drawings showing coil dimensions, construction materials, watt density, ratings and performance including pressure drops on airside.
B. Wiring Diagrams: Furnish a separate, complete wiring diagram for each heater. Diagram shall include recommended supply wire gauges per NEC, and fuse sizes. Typical wiring diagrams are not acceptable. Each heater shall be complete with clearly marked power and control terminals.
C. Verify control panel size, door swing and duct size with contractor supplied ductwork shop drawings prior to submittal, and ordering heaters. Verify electrical characteristics and control requirements prior to order.

PART 2 PRODUCTS

2.1 EQUIPMENT

A. Duct heaters shall be open coil heaters. Voltage, size, wattage, number of steps and control voltage shall be as scheduled on the drawings. Three-phase heaters shall be furnished with balanced three-phase steps. Heaters shall be UL listed for zero clearance and shall meet all applicable requirements of the 1999 National Electric Code.
B. Type: Heaters shall be of the slip-in type for duct mounting.
C. Elements shall be constructed of 80% nickel and 20% chromium; steps shall be arranged to prevent stratification when operating at less than full capacity. The maximum watts per square inch of wire surface shall be up to 150 HW=50.
D. Coil terminals shall be of stainless steel, terminal insulators and bracket bushings shall be constructed of ceramic and securely positioned. Terminals shall be machine crimped to coil.
E. Frame shall be constructed of sufficiently heavy gauge galvanized steel to assure structural rigidity and have vertical galvanized steel supports with stiffening ribs and gussets spaced no more than 4" apart, spot welded to the casing.
F. Terminal box shall be provided with solid cover in order to minimize dust infiltration and shall be hinged. Heater terminal box must be totally enclosed and must be without perforated or expanded sheet metal covers. Terminal box shall be insulated.

G. Provide a recessed terminal box when coils are installed in ducts with internal obstruction greater than 1" to assure that heating elements and safety controls are in the air stream.
H. Orientation: Heaters shall be interchangeable for mounting in a horizontal or vertical duct.
I. Safety Devices: A disc type automatic reset thermal cutout shall be furnished for primary over temperature protection. For secondary protection, a sufficient number of heat limiters in the power lines shall de-energize elements if the primary cutout fails. All safety devices shall be serviceable through the terminal box without removing the heating coil from the duct.
J. Built-in components shall include disconnecting break magnetic contactors, transformer with primary fusing, pressure-type airflow switch set at .07" WC, all as required by UL, branch circuit fuses per NEC, interlocking disconnect switch and a single terminal block to accept the number, type and size of conductors as required. Terminal box shall be insulated.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install systems as required and as recommended by the electric heater supplier.
B. The electric heater shall be mounted in the duct in accordance with the requirements of SMACNA Ducted Electric Heat Guide.
C. The electric heater shall occupy entire cross sectional area of duct.

END OF SECTION