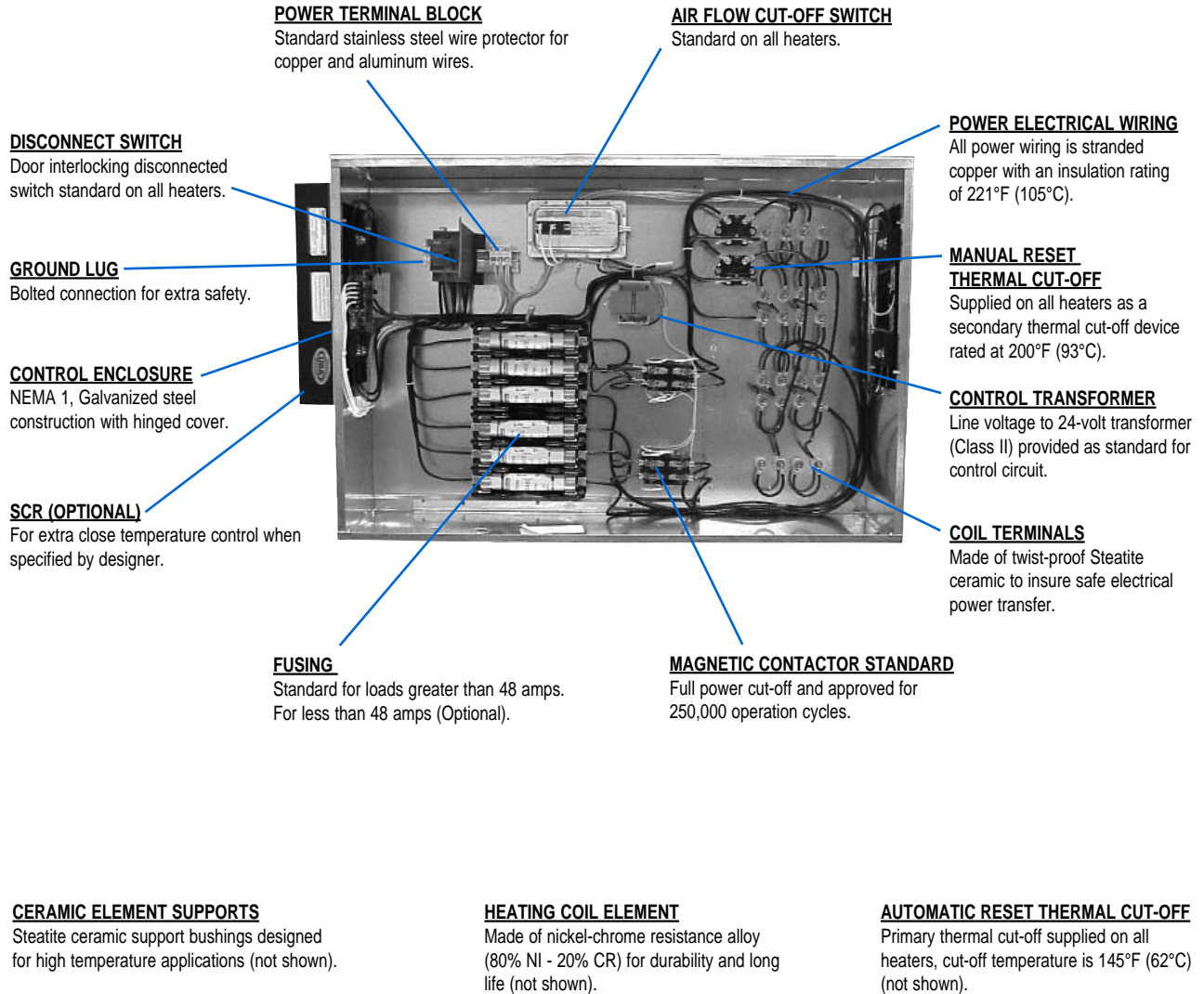
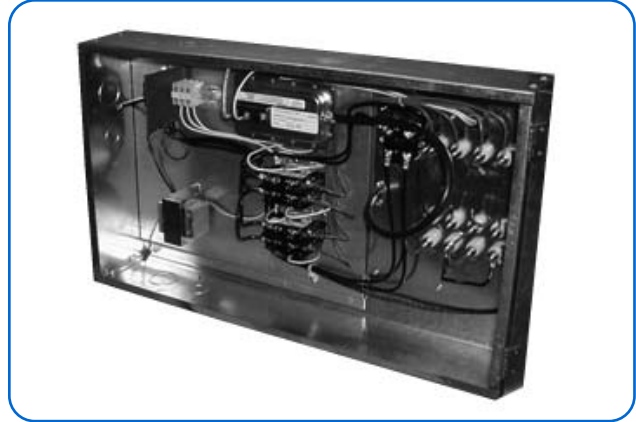
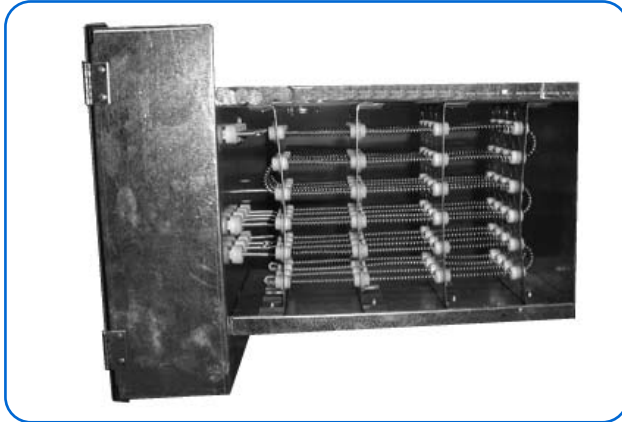


**PRODUCT FEATURES AND CONSTRUCTION**



\*Internal components may vary.

## GENERAL INFORMATION



Carnes electric duct heaters are designed for use in commercial and industrial HVAC duct systems. Our open coil heater design comes from closely evaluating the needs of design engineers, contractors and end users. Carnes duct heaters may be used to heat an entire building or as a supplemental heating source. Our duct heaters are tested as an integral component of fan powered and throttling type air terminal units for VAV systems. However, this heater design may be used as a stand-alone device in HVAC systems.

### ***ETL LISTED AND APPROVED TO UL STANDARDS***

Carnes electric duct heaters have been tested and certified by Underwriters Laboratories to **UL** STD 1996 **UL** File Number E245517.

### ***PRODUCT QUALITY***

Our electric heater components have been selected following stringent selection criteria to ensure long, safe and reliable operation.

- **Electrical Components**

All electrical components are approved to **UL** standards.

- **Heater Elements**

All heater elements are constructed from a nickel-chrome alloy without joints except at connecting studs (80% NI - 20% CR, Grade A wire @ 45 watts/in<sup>2</sup>).

- **Power Wiring**

Electric power wire rating has been standardized to 221°F (105°C). This high-grade wire is used on all electric heaters.

- **Magnetic Contactors**

All duct heaters are provided with magnetic contactors as standard. These devices provide full power cut-off and are rated for 250,000 duty cycles.

- **Construction**

The controls enclosure and element frame are built from 20 gauge (minimum) galvanized steel. Our standard **NEMA-1** control enclosure exceeds **UL** requirements.

## STANDARD SAFETY DEVICES

- **Air Flow Switch**

An air flow cut-off switch is provided on each heater to ensure air flow across the heating elements. Switch makes at .07" W.C. (fan interlock relay used on fan terminals).

- **Primary Thermal Cut-Off**

An automatic reset thermal cut-off is standard and will stop the unit when the high limit temperature is reached. The heater will re-start automatically when the temperature has dropped below the high limit of 145°F (62°C).

- **Secondary Thermal Cut-Off**

A manual reset thermal cut-off is also standard and will stop the unit when the high temperature limit is reached. The heater must be carefully inspected prior to manual resetting of this thermal cut-off (cut-off temperature 200°F (93°C)).

- **Disconnect Switch**

A door interlocking disconnect switch is used to disconnect the electric supply from the outside of the controls enclosure prior to service or inspection. This safety feature is often specified and is available with or without power fusing.

- **Fan Interlock Relay**

A fan interlock relay is used on electric duct heaters for fan terminal units. This device ensures that the fan is energized prior to the electric heater.

- **Steatite Element Supports**

Heater element support bushings are made of a Steatite ceramic material designed for high temperature industrial applications. This material has high dielectric strength and resistance to thermal and mechanical shocks.

- **Steatite Coil Terminals**

Coil terminals are made of a Steatite ceramic material. These twist-proof insulators provide safe electrical transfer from the control panel to the elements.

- **Transformer Standard**

A line voltage to 24-volt class II transformer with internal overcurrent protection is provided with each electric duct heater. Primary voltages of 120-600 volts are available.

- **Terminal Block**

The power wiring terminal block is supplied with a stainless steel wire protector for copper or aluminum wires. A bolted ground lug is provided for added safety.

### **POWER FUSING (Optional)**

- **UL** and **NEC** codes require supply fusing for all electric duct heaters that draw more than 48 amps. Heaters over 48 amps will be sub-divided into circuits not exceeding 48 amps and will be fused accordingly. Power fusing is available for units that draw less than 48 amps when specified.

### **SCR CONTROLLER (Optional)**

- Silicone controlled rectifiers (SCR) provide very accurate, heat control and silent duct heater operation. Heat output is precisely controlled from 0 to 100% when used with a modulating type room thermostat. Typical SCR input signals are 0-5 Vdc, 0-10 Vdc, 4-20 mA and 0-135 ohms.