



# GRAND ELECTRIC DUCT HEATER

**GRAND** designs and manufactures commercial and industrial electric heating and control systems that set the industry standard for excellence. The company's heating solutions reflect more than 35 years of innovation, product quality and efficient service.

Our heaters and controls range from the simplest standard duct heater to the most sophisticated, custom designed comprehensive system. **GRAND'S** attention to detail and rigorous testing give customers premium products that they receive quickly and at a fair market price.

**GRAND** manufactures open coil heating elements and can supply virtually any duct heater. Most simple space heating applications use the open coil design.



Only the high Grade 25% chromium alloy resistance wire is used in all **GRAND** duct heaters with max. temperature 1300°C. This wire has a higher maximum operating temperature, greater life, lower sag, less resistance change and higher corrosion resistance. An extended shank on the terminal places the critical resistance coil-to-terminal connection well out into the airstream to keep it cool even in applications where up to 1" of interior insulation is used in the duct.

**Element Temperature** – The open coil element releases its heat directly into the airstream. As a result, the open coil runs cooler than the coil in the finned tubular element which is isolated from the air by insulation and a metal sheath.

**Low Pressure Drop** – Because of the high percentage of open space across the heater, open coils have very low pressure drop as compared to finned tubular heaters. This can result in reduced fan motor horsepower and makes it possible to retrofit open coil heaters into existing systems without changing the fan motor.

## ***SPECIFIC REQUIREMENT***

### **Minimum Velocity**

Electric heaters differ from steam or hot water coils in that the heat output is constant as long as the heater is energized. Therefore, sufficient airflow must be provided to prevent overheating. The minimum required velocity based on entering air temperature and KW per square foot of cross sectional duct area must be maintained see instruction manual. The maximum air inlet temperature for open coil heaters is 100°F (38°C)

### **Maximum Velocity**

High velocity airflow is not normally encountered in typical commercial HVAC applications, when installing open coil duct heaters into velocities over 1200 feet per minute contact GRAND representative.

## ***STANDARD CONTROL OPTIONS***

Copper wire with a minimum of 105°C insulation is used throughout. Connections are made with either box lugs or connectors crimped on. Terminal blocks are provided for all field control and power wiring.

### **Control Option – Basic**

Control Option basic package designed for normal comfort heating applications – i.e., those that do not require the unique features of SCR control. The temperature is controlled by a pilot duty thermostat or a step controller. Control includes the following:

## **SHAN CONTROLS PVT LTD**

- 45 Hill View, Mini Commercial, Phase 7, Bahria Town, Islamabad – Pakistan.
  - 1<sup>st</sup> Floor, Aiwan-E-Sanat Building, ST-4/2, Sector 23, Korangi Industrial Area, Karachi – Pakistan.
- Tel Kar: 021-3506 9297 / 3506 5199 Fax: 021-3506 5254 Isl: 051-517 2280 / 517 2281, Fax: 051-517 2282



# GRAND ELECTRIC DUCT HEATER

- All controls except thermal cutouts, airflow switch and pilot switch will be supplied in a separate **NEMA 1 panel**. Wall mounting panel is made from heavy gauge steel, painted RAL7032 finish, and are provided with a lock and key.
- **Thermal cutouts** to protect against overheating. The automatic reset cutout is wired into the control circuit to de-energizes the heater load.
- Terminal block for differential pressure **airflow switch** to de-energize the heater control circuit upon loss of airflow. Air flow switch available as optional on demand.
- Electronic Stage **Temperature Controller** to control heat output in stages to meet required temperature setpoint. Duct temperature sensor included.
- **Magnetic contactors** for each heater stage.
- **Fuses** to protect each circuit.
- **Disconnect circuit breaker** to protect service personnel.
- **Backup Magnetic contactors** (Optional).
- “Stage On” **Pilot Light(s)** to indicate when each heating stage is producing heat.
- “Heater On” **Pilot Light** to indicate that power has been supplied to the heater.
- “Low Airflow” **Pilot Light** to indicate that airflow has been interrupted (Optional).



## Control Option – SCR

- Separate **NEMA 1 panel** with all controls except thermal cutouts, airflow switch and pilot switch will be supplied. Wall mounting panel is made from heavy gauge steel, painted RAL7032 finish, and are provided with a lock and key.
- **Thermal cutouts** to protect against overheating. The automatic reset cutout is wired into the control circuit to de-energizes the heater load.
- Terminal block for differential pressure **airflow switch** to de-energize the heater control circuit upon loss of airflow. Air flow switch available as optional on demand.
- Electronic **Temperature Controller** with **SCR power controllers** to modulate the entire heater load between 0-100%. Working on a one second time base, the heater will only be energized for the number of AC cycles necessary to produce the exact required amount of heat resulting in very precise temperature control using the least amount of energy. The resulting precision and rapid response make the SCR the preferred choice for many heating applications. to control heat output in stages to meet required temperature setpoint. Duct temperature sensor included.  
The SCR is switched on only as the voltage wave form crosses the zero point, which virtually eliminates radio frequency interference (RFI).
- Hi temperature SCR alarm **Pilot Light** to indicate when SCR is overheated.
- **Disconnect circuit breaker** to protect service personnel.
- **Backup Magnetic contactors** to disconnect power to heating element in case of no air flow and/or SCR high temperature alarm.
- Class 1 **Control Transformer** for 24VAC controls supply to control circuit.



## RELATED PRODUCT

- Differential Pressure Airflow Switch
- Microprocessor Controller with BMS output BacNet/MSTP

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