

Explosion-proof Duct Heaters

Engineering Information

National Electrical Code Requirements for Duct Heaters

In addition to the general requirements for hazardous areas on pages 42 and 43, the NEC also requires that all duct heaters have built-in protection against low airflow, primary and secondary overtemperature protection, and overcurrent protection for heaters drawing more than 48 amps. These safety features are provided with all HEATREX explosion-proof duct heaters.

Airflow Requirements

Airflow must be calculated to give the required temperature rise and to ensure sufficient airflow to prevent the thermal cutouts from tripping prematurely.

Required air volume to give the desired temperature rise for a given KW is determined by the formula: $SCFM = KW \times 3193 / \Delta T$ where SCFM is airflow volume in Standard Cubic Feet per Minute and ΔT is temperature rise in °F.

Minimum air velocity for safe operation is determined by dividing the heater KW by the cross-sectional duct area: $KW / Sq. Ft. = KW / (W \times H / 144)$ where W and H are duct width and height in inches. For 227 Series duct heaters, use the minimum W x H dimensions shown in the Heater Listing on page 48. Read the minimum velocity from the horizontal axis of Figure 72 for 227 Series Duct Heater or Figure 73 for 220 Series heaters.

Airflow must be uniform over the face of the heater, and must be horizontal for all but Custom Explosion-proof Duct Heaters.

Horizontal airflow direction is defined in Figure 71.

Pressure drop through the heater can be determined by using Figure 74 for the 227 Series duct heater.

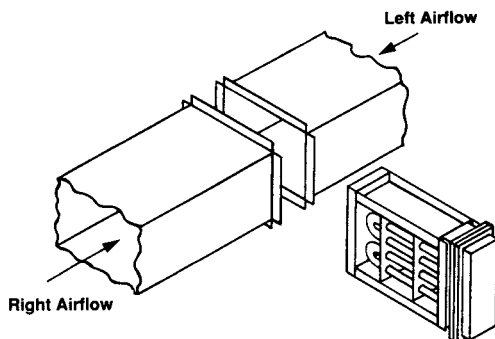


Figure 71.

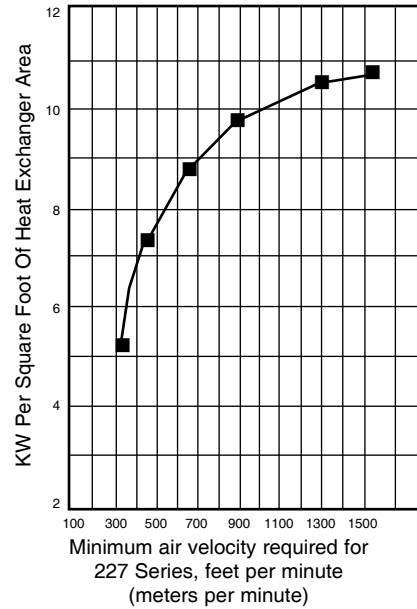


Figure 72.

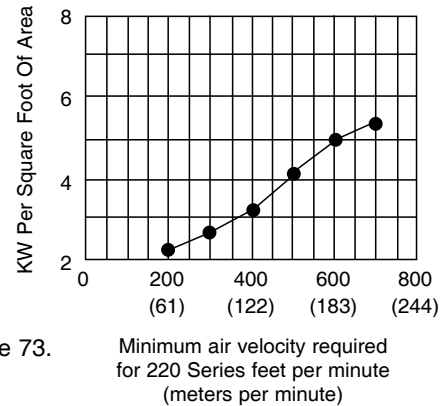


Figure 73.

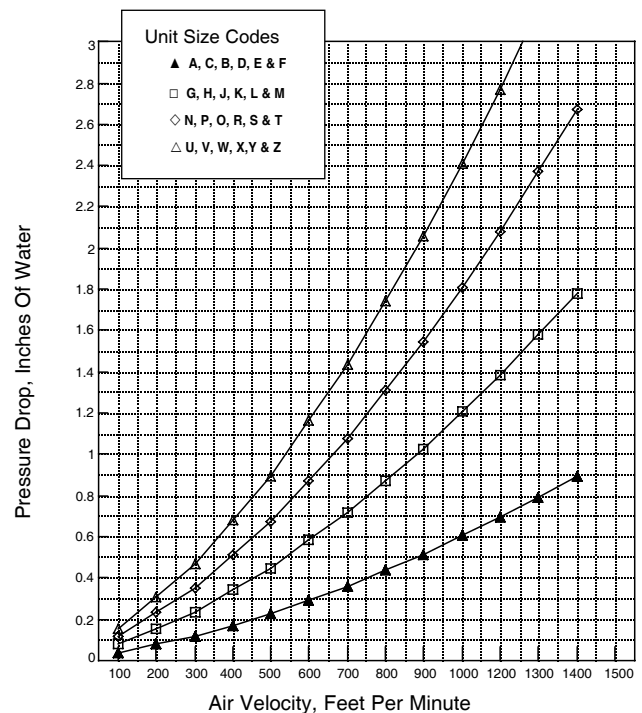


Figure 74.

227 Series
Pressure Drop Curve