

220 Series Explosion-proof Duct Heaters

Standard Construction

Galvanized Sheet Metal Frame includes external flanges for field mounting and an element terminal box. Terminals are factory-connected to control safety components in an integral cast aluminum explosion-proof box.

Three Levels of Safety are provided on every heater: automatic and manual reset thermal cutouts, plus a fan interlock relay.

The automatic reset cutout, operating through the temperature control system, is the primary protector. The manual reset operates a separate backup magnetic contactor, independent of the temperature control system. The fan interlock relay prevents the heater from being energized, unless the fan starter is on.

Standard Built-in Control Package includes the following components mounted in a cast aluminum explosion-proof enclosure:

- De-energizing control and backup magnetic contactors.
- 24 volt control circuit transformer.
- Fan relay for heater/fan airflow interlock. Supplied with 120V or 24V coil to match the fan starter.
- Terminal blocks for field power and control wiring.
- Grounding terminal.
- Supplemental fusing for heaters drawing more than 48 amps.

Industrial Grade Heating Elements, built by HEATREX, are .475" (1.21 cm) diameter to provide extra insulation between the coil and sheath for high voltage protection. Stainless steel fins are helically wound onto the stainless steel sheath.

Control Options

Two standard control options are available:

Staged Control – Either single or multi-staged through a step controller, which may be built-in or remotely mounted. Each three-phase stage has a multiple of three elements to balance the electrical load.

Solid-State SCR Control – When temperature must be controlled precisely, built-in SCR's are recommended. They are furnished with field-selected inputs of 2200 ohms, 135 ohms, 0-10 VDC, or 4-20 mA. SCR's have zero-cross firing to eliminate radio frequency interference.

Installation

Complete installation instructions are furnished with each heater. The following are some guidelines:

- The heater must be attached to external duct flanges.
- The heater must be adequately supported. If the duct flanges will not afford enough support, use overhead hangers for additional support.
- Airflow must be horizontal. See page 44 for airflow requirements.

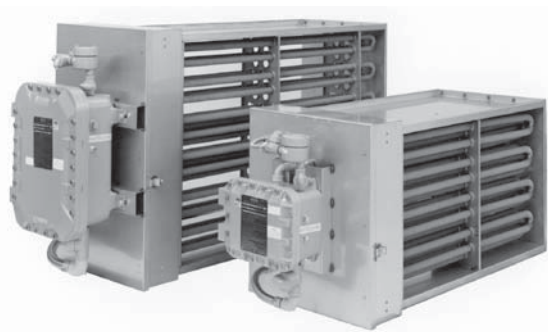


Figure 85. 220 Series Explosion-proof Duct Heaters



Class I, Division 2
Groups C and D
Temperature Code
T3, 392°F (200°C)

Ratings Available
• Up to 240 KW
• Up to 600V



220 Series Explosion-proof Duct Heaters

Table XXI

Custom Options

Option	Description	Code
Built-in Step Controller	For two through ten heating stages. Input is field-selected at 2200 ohms, 135 ohm, 0-10 VDCs, or 4-20 mA.	B
Built-On Disconnect Switch	To meet NEC requirement for a disconnect at or within sight of the heater. (Not available for outdoor or washdown)	D
Built-on Airflow Switch	An explosion-proof differential pressure switch replaces the fan relay. Use only for positive pressure inside the duct. (Not available for outdoor or washdown).	P
Supplementary Fusing	For heaters drawing 48 amps or less. Fusing is standard above 48 amps.	F
"Warning" Pilot Light	Red light to indicate when a thermal cutout or airflow interlock has tripped.	K
"Heater On" Pilot Light	Green light indicates when there is power to the heater.	L
Disconnecting Magnetic Contactors	Contactors that break all ungrounded lines replace standard de-energizing contactors.	M
120 Volt Control Circuit	A 120V control transformer with one leg fused replaces the standard 24V transformer.	V
NEMA 4 Construction	Explosion-proof box is gasketed for outdoor or wet locations	G

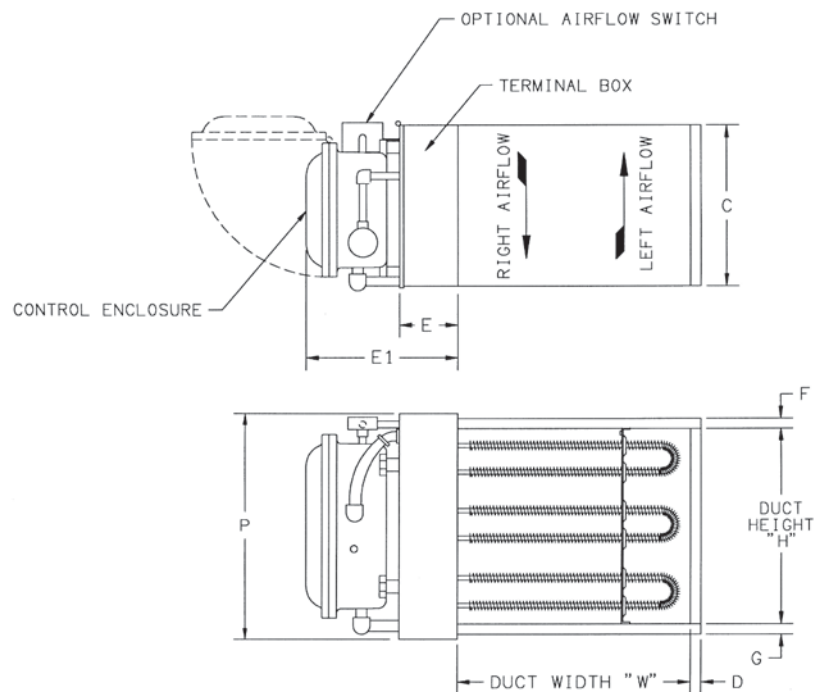


Figure 86. Dimensional Drawing for 220 Series

220 Series

Explosion-proof Duct Heaters

How to Order

1. **Inside Duct Dimensions** – Width (W) by Height (H) per Dimensional Drawing on page 52. Maximum size 240" (610 cm) x 120" (305 cm). Other dimensions will be shown on certified print.
2. **KW Rating** – Up to 1000 KW.
3. **Heater Voltage and Phase**
4. **Temperature Control** – Staged or SCR control. If staged, specify number of stages (one through ten). If SCR control, specify input signal.
5. **Fan Relay Voltage** – Specify 24 or 120 volt to match fan starter holding coil voltage.
6. **Airflow Direction** – Horizontal right-hand or left-hand airflow, as defined on page 44.
7. **Airflow Volume** – Minimum flow in SCFM (Standard Cubic Feet per Minute) over the heater.
8. **Maximum Inlet Air Temperature** – Maximum of 80°F (27°C). If inlet air will be higher, consult factory.
9. **Options** – Select from 220 Series Custom Option codes in **Table XXI**.

- 2. Duct heaters shall have automatic and manual reset thermal cutouts for redundant overtemperature protection, fan relay for airflow interlock, de-energizing controlling and backup magnetic contactors, 24 volt control circuit transformer, terminal blocks for field wiring and supplementary fusing for heaters over 48 amps. Controls shall be housed in a NEMA 7, 9 cast aluminum enclosure.
- 3. Duct heaters shall consist of industrial grade HEATREX stainless steel finned tubular electric heating elements mounted in a heavy-gauge galvanized steel frame.
- 4. Duct heaters shall be furnished with the control option indicated below (select one):
 - Single stage on/off control with field installed thermostat.
 - Multi-staged control with built-in step controller and field installed thermostat.
 - Solid-state control with built-in zero-cross switching SCR and field installed thermostat.
- 5. The following options are to be included:
 - Built-on disconnect switch.
 - Built-on airflow switch in place of the fan relay.
 - Supplementary fusing for heaters drawing less than 48 amps.
 - "Warning" pilot light to indicate overtemperature or no airflow.
 - "Heater On" pilot light to indicate power to the heater.
 - Disconnecting magnetic contactors.
 - 120 volt transformer in place of 24 volt transformer.
 - NEMA 4, 7, 9 gasketed control box for wet locations.

Sample Specification

A sample specification can be prepared by using the following information. A circle has been supplied so that you may darken those sections which you require. Material which is part of the standard 220 Series Explosion-proof Duct Heater specification has already been darkened.

- 1. Electric explosion-proof duct heaters shall be HEATREX 220 Series of the KW rating, voltage, phase, duct size and airflow direction specified in the schedule. They shall be Factory Mutual and CSA Approved for:

- Class I, Division 2, Groups C and D, Ignition Temperature Code T3, 392°F (200°C)

Typical Series EP2 Duct Heater Schedule

Tag No.	KW	Supply Line		Stages	Duct Dimensions (Inches)		Special Features
		Volts	Phase		W (Width)	H (Height)	
DH1	3	480	3	2	24	12	Built-on disconnect switch
DH2	10	480	3	3	36	18	
DH3	15	480	3	5	72	24	Warning pilot light

