

Installation Process

IMPORTANT:

Please refer to Manufacturer's Installation and Operation for proper installation and guidelines.

It is recommended to use a seven (7) conductor cable for thermostat interface.

It is required for the duct mounted heater to have an independent power supply

In fiber glass duct systems, a metal sleeve **MUST** be used to insert and support the heater.

Electrical Terminations and Unit Interface

1. Run minimum 18 AWG wire (field provided) for W, E and C terminal connections from heater electrical box to heat pump unit electrical box for thermostat terminations.
2. Use the low voltage manufacturer supplied black¹ 18 AWG wire from heater and terminate it in the C "common" terminal of the unit's terminal block.
3. Use wire nuts to connect manufacturer supplied white¹ 18 AWG wire from heater with W1 wire from thermostat.
4. Use wire nuts to connect manufacturer supplied purple¹ 18 AWG wire from heater with E wire from thermostat.

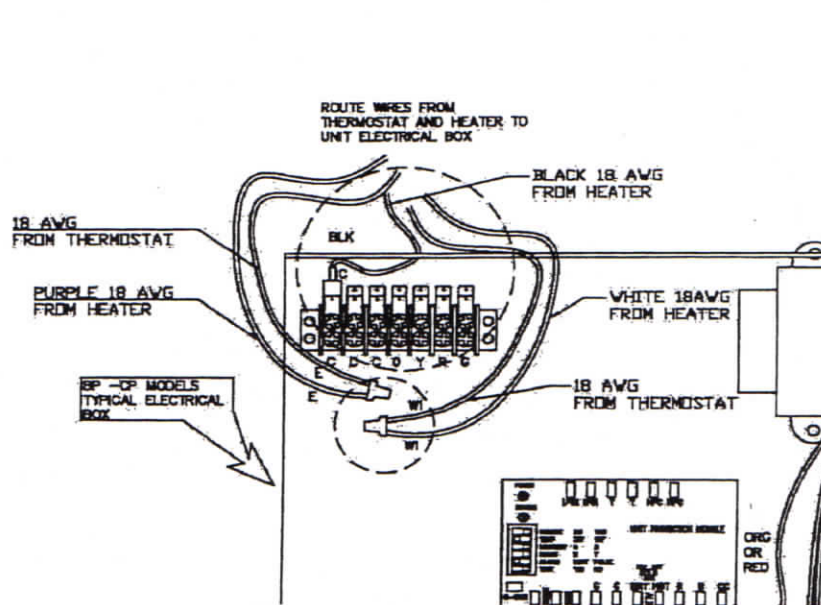


Figure 1 - Duct heater terminations

¹ It is recommended that the installing contractor follow wire colors for ease of wiring identification.

MR SERIES DUCT HEATERS INSTALLATION MANUAL

BTU ELECTRIC HEATERS

These Duct Heaters may be used with Heat Pumps, Cooling Units, or with any Forced Air System. They are suitable for Zero Clearance Installations in vertical or horizontal duct systems.

MODEL NUMBERING SYSTEM: The letters **MR** mean Manually Resettable Thermal Switches and are used for the secondary protection. The next group of numbers designates the minimum Duct Size with the side to be cut first and the length of the insertion next. Numbers following the first dash indicate the KW. The -1 or -3 following denotes single or three phase. S or F on the end would designate Sequencing Relays or Flanged Construction.

EXAMPLE: MR816-5-1 means a Manual Reset Type Heater to go in the 8" side of an 8" x 16" Duct, 5KW, 1 Phase.

Heaters may be ganged in order to fill a duct. For example, two 12" x 24" heaters may be used to fill a 24" x 24" duct. They should not be used so the outlet air from one becomes the inlet air of the next unless the inlet to the second is below 110° F. Air Flow should be sufficient for the sum of both Heaters. See the Air-Flow limit chart on the other side of this instruction sheet.

These Duct Heaters **MUST** be installed according to the following Guidelines:

1. At least 4 Ft. downstream from air source or elbow. If closer than 4 Ft. may require turning vanes, baffles or other devices to assure an even distribution of air over the face of the heater.
2. At least 2 Ft. before an elbow or may require devices as in #1.
3. Transitions to and from a Duct Heater should be limited to 20% of the duct area per linear foot.
4. Always mount in the side of a vertical or horizontal duct. **NEVER MOUNT FROM TOP OR BOTTOM OF A HORIZONTAL DUCT!**
5. All duct materials must be suitable for 250° F. operation.

The air duct should be installed in accordance with the Standards of the National Fire Protection Association for the Installation of Air Conditioning and Ventilating Systems Pamphlet No. 90A and No. 90B.

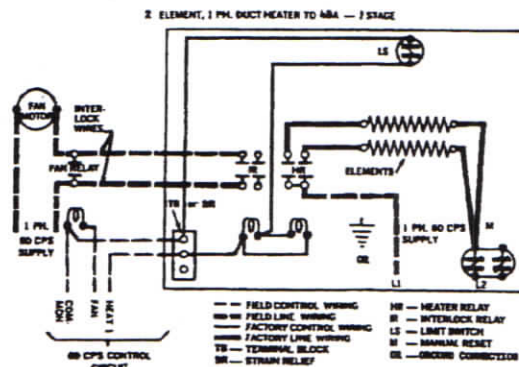
Locate the Heater so that it is completely accessible and that normal ventilation is assured.

Installing the Heater consists of cutting an opening in the duct that will clear the heater frame enclosure. Insert heater and fasten to the duct through mounting holes in the control box. Observe all labels as to direction of air flow, wire sizes and type, and rated voltages.

The amount of air curtain between the Heater Element(s) and Limit Switch(es) must not be reduced by internal Duct Liner within 1 ft. before or after the Heater. In Fiber Glass Duct Systems, a metal sleeve inside the duct to support the Heater must be used. If the base of the Heater Terminal Box is not flush with the air stream, nuisance cycling may result.

Field connected wires entering the Heater Controls Compartment must be Copper suitable for 75°C. (167° F.). Field wire the Supply and Control circuits in accord with National and Local codes and use the wiring diagram supplied with each heater as a guide. The Heater must not operate unless the Fan is on. Never use a fan delay with these duct heaters.

TYPICAL INSTALLATION WIRING DIAGRAM



BTU
FT. LAUDERDALE, FLA.

MINIMUM AIR FLOW REQUIREMENTS ACROSS THESE HEATERS

Each KW produces 3413 BTUH. Divide the BTUH of heat needed by 3413 to find the KW needed. Use the chart below to find the minimum airflow needed. You will need to know the maximum inlet air temperature of the Heater. The outlet air from a Heat Pump (sometimes 110 F.) would be the inlet air to an auxiliary Heater. You must also know the KW per Sq. Ft. of the MINIMUM Duct Area (KW/SQ. FT. MDA.) for the Heater. An Example is worked out below:

EXAMPLE: Using a 12 KW Heater designed for minimum duct size 8" x 16" and being the only Heat in a residence. You expect inlet air to the Heater will be 77 F. maximum.

8" x 16" divided by 144 = .888 Sq. Ft. of Heater MINIMUM Duct area design. 12 (KW) divided by the .888 = 13.5 which is the KW/SQ. Ft. MDA. Locate the 13.5 along the top side of the chart and from there draw a vertical line downward until the 77 F. inlet air line is intersected. From point of intersection draw a horizontal line to the left side of the chart to the answer of 800 FPM (Velocity) of air minimum required over the Heater.

To convert to CFM multiply the answer by the Sq. Ft. of the Heater MINIMUM duct area design. In the example 800 multiplied by .888 would be 710 CFM.

These minimum airflow requirements should be met at any point over the face of the Heater. If Heaters are used in ducts larger than the Heater minimum duct design, reliable means should be used to assure the proper airflow through the Heater.

KW PER SQ. FT. MINIMUM DUCT AREA HEATER DESIGNED FOR (KW/SQ. FT. MDA)

