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Airwellcare

Management System ISO 9001:2008

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www.tuv.com ID 9105080618

Electric Duct Heaters

Our Product Ranges

Dampers

1 Fire Dampers
2 Fire / Smoke Dampers
3 Volume Control Dampers
4 Motorized Control Dampers
5 Pressure Relief Dampers /Non Return Dampers

Variable Air Volumes

6 Pressure Independent VAV
7 Constant Air Volume VAV
8 By Pass VAV

Louvers

9 Sand Trap Louvers
10 Acoustic Louvers
11 Stationery Louvers / Architectural Louvers
12 Storm Louvers
13 Weather Louvers

Sound Attenuators

14 Rectangular Sound Attenuators
15 Circular Sound Attenuators
16 Crosstalk Attenuators

Electric Duct Heaters

17 Flange & Slip 'n' Type
18 Modulating & On/Off Type

Air Outlets

19 Registers & Grilles
20 Diffusers (Linear Diffusers, Sq. & Rect. Ceiling Diffusers, Round Diffusers, Jetflow Diffusers
21 Swirl Diffusers & Disc Valves
22 Drum Louvers

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General Information

Electrical Duct Heaters

Introduction

Airwellcare engineers and technicians have contributed their knowledge, skills and expertise towards the design and manufacture of truly fine heaters.
Our goal was to reach a standard of duct heaters liable to match, if not surpass, the quality of the most reputed brands and to withstand the severe climatic conditions of the United Arab Emirates

Airwellcare duct heaters are approved by the private authorities together with an increasing number of consultants in the area. We are proud of what we have achieved and we are looking forward in sharing the success with you

AHS DH 100 A

Recomend

All heaters should be installed and electrically connected as per given instructions and wiring diagram supplied with each heater Misapplication of heaters may result in on the job failure or malfunctions.

Heaters For Air Handling Units

We are capable to manufacture built-in heaters for air handling units. For more details. Please refer to us.

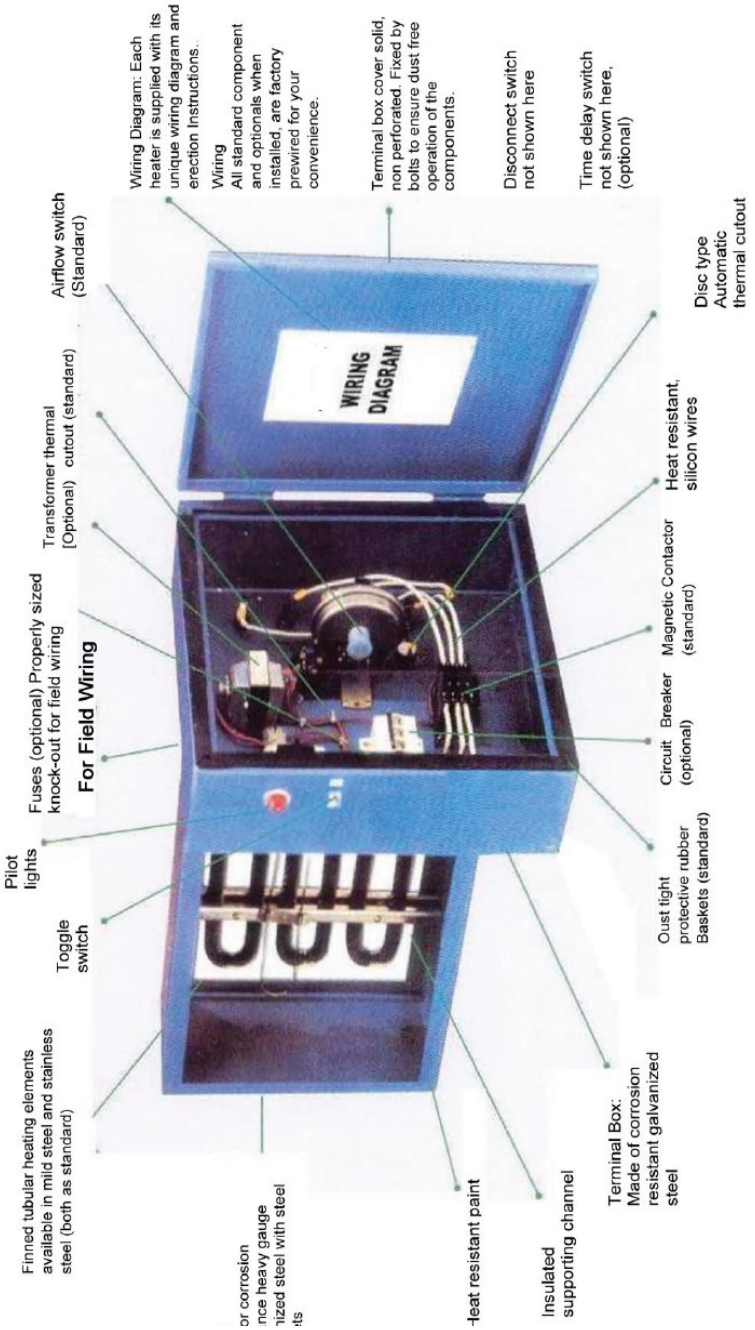
Guarantee

Airwellcare Duct Heaters are guaranteed to the original purchaser to be defect free in materials and workmanship for a period of 12 months from the date of Delivery. Guarantee terms are not applicable on heaters which are not installed and serviced as recommended.

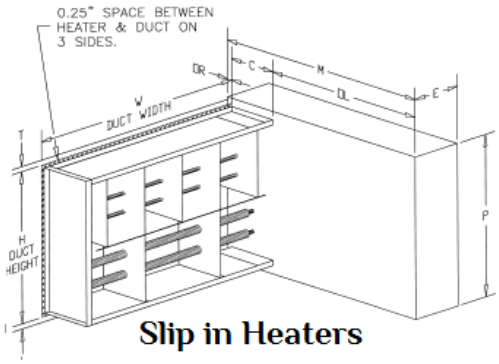
Dimensional Drawings

Once requested, we will supply a shop drawing showing the actual physical dimensions of the heater and arrangement of elements.

Product Description



Construction Details



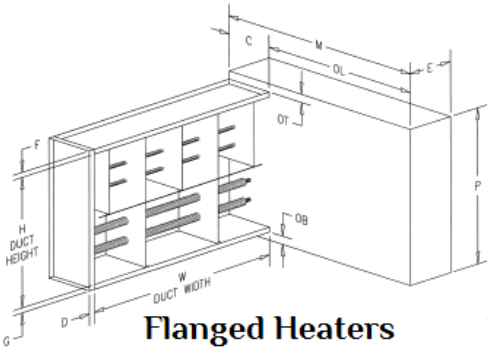
Slip in Heaters

Slip-in heaters are designed so that the entire frame, except the terminal box, slips into the duct with 1/4" (6.35mm) clearance all around.

It is installed through a rectangular opening in the side of the duct and held in place with sheet metal screws through the back of the terminal box, which is large enough to provide a seal with the duct. Figure 40 illustrates the construction and provides reference dimensions.

Slip-in construction is used because it allows duct work to be installed before the heaters are available, simplifies on-the-job changes in heater location, and is easily retrofitted into existing duct systems. Furthermore, small slip-in heaters may be installed without any special provisions for their support.

While custom slip-in heaters can be provided to fit specific duct dimensions (W x H), selecting standard open coil type QUA heaters maximizes economy and minimizes delivery times.



Flanged Heaters

Flanged construction is available with inside face dimensions exactly matching the duct dimensions. The heater frame is attached to matching turned out duct flanges as illustrated

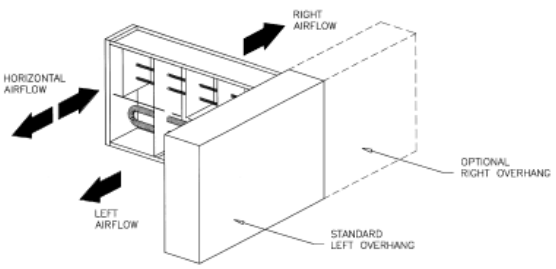
Standard flanges are a minimum of 3/4" deep; deeper flanges are provided on larger heaters for structural reasons. Custom flanges can be provided upon request.

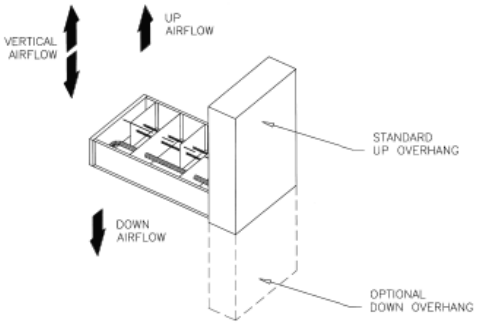
Standard QUZ flanged heaters are available to meet many of the commonly used duct sizes. Listings of the available sizes are shown on page 25. Full range of control options and construction features are offered.

Heater Frame and Terminal Box

Frames and terminal boxes are fabricated from heavy gauge corrosion resistant steel. Optional stainless steel frames are recommended for wet or corrosive applications. Standard NEMA 1 type terminal boxes have hinged covers.

Finned tubular heater element support brackets a spaced on 36" (914 mm) maximum centers.





Electric Duct Heater

SLIP IN TYPE HEATERS

It is designed so that the frame dimensions are slightly smaller than duct dimensions. The entire heater except the terminal box slides through a rectangular opening in the side of the duct with 1/4" clearance all around.When installed, the face area of the heater is at right angle to the air stream. Slip in heater is widely used because it allows duct work to be installed before the heaters are available, simplifies on changes in heater location and it is easily installed into existing duct systems. Furthermore, small slip-in heaters may be installed without any special arrangements for their support.

AHS DH 100 A

FLANGED HEATER

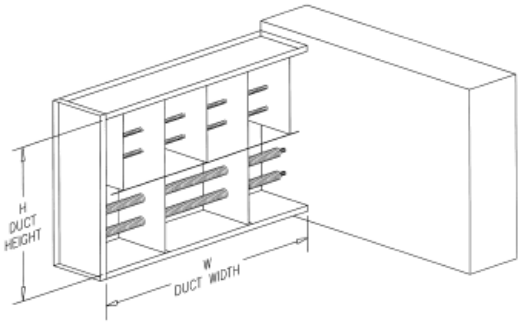
(With Removable Heater Section)

Consists of a slip-in heater mounted in a flanged duct section. Frame dimensions are made to match exactly duct dimensions. The frame is then attached directly to external flanges of the duct where the slip-in portion could be pulled out without removing flanges from duct. All controls are mounted in the terminal box of the slip in portion.

AHS DH 100 B

Minimum & Maximum Duct Dimensions
Finned Tubular Heating Elements

	Slip-in Type in (mm)	Flanged Type in (mm)
Minimum Duct Width (W)	4.75 (121)	4.5 (114)
Minimum Duct Height (H)	5.25 (133)	4 (102)
Maximum Duct Width (W)	175 (4450)	175 (4450)
Maximum Duct Height (H)	120 (3050)	120 (3050)



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 and nuisance tripping of the thermal cutouts. The minimum required velocity is determined from Figure 4A or 4B on the basis of entering air temperature and KW per square foot of cross sectional duct area.

The maximum air inlet temperature for open coil heaters is 100°F (38°C) and for finned tubular heaters is 80°F (27°C).

Example: Determine whether the minimum air velocity requirement is met for a 10 KW open coil heater installed in a 24" wide x 12" high duct operating with 1000 cubic feet per minute (CFM) of air at a maximum inlet temperature of 65°F:

1. Duct Area = 24" x 12"/144 = 2 sq. ft.

2. KW per square foot = 10 KW/2 sq. ft. = 5.

3. Go to Figure 4B. Use top curve (below 80°F inlet air).Find 5 KW per square foot on the vertical axis. Read minimum velocity required, which in this case is 310 feet per minute (FPM).

4. Heater air velocity =1000 CFM/2 sq.ft. = 500FPM. Since 500 FPM exceeds the minimum, this installation is safe.

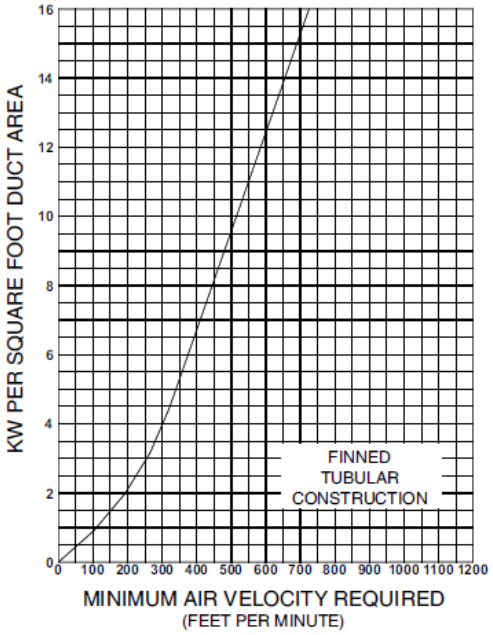


Figure 4A.

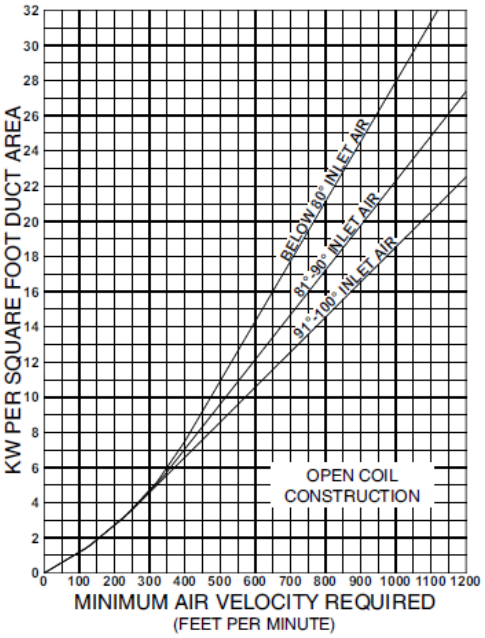
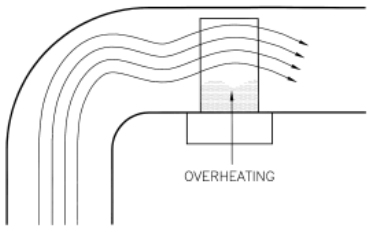


Figure 4B.

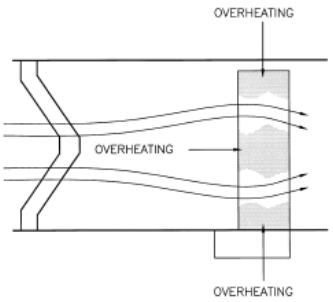
Airflow Uniformity

To prevent hot spots, airflow must be uniformly distributed across the heater face. Figure 5 illustrates typical heater misapplications which result in non-uniform airflow. The heater's UL Listing requires that it not be installed closer than 4' (122 cm) downstream or upstream from a fan outlet, abrupt transition, or other obstructions.

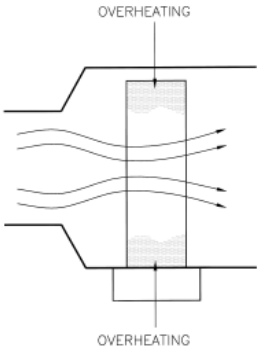
Elbows or turns must be located at least 4' (122 cm) from inlet of the heater and 2' (61 cm) from outlet of the heater.



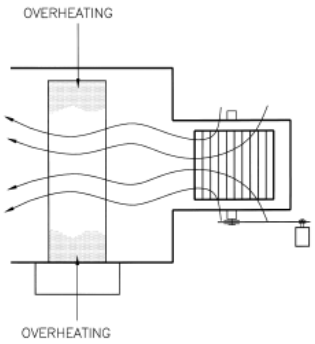
Heater too close to elbow



Heater partially blocked by filter or frame member



Heater adjacent to transition

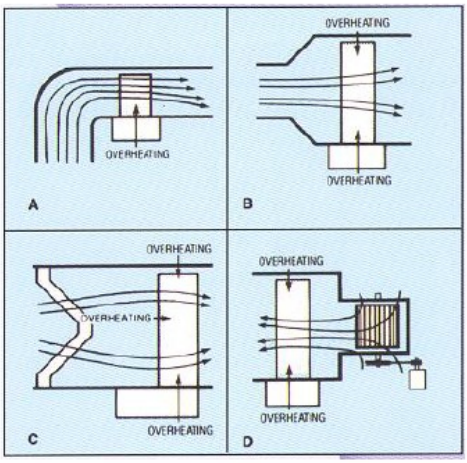


Heater too close to fan

Figure 5.

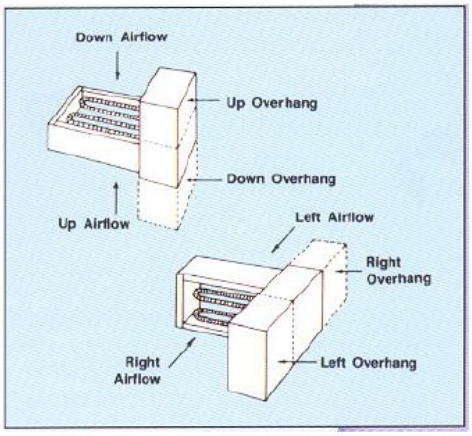
Mounting

To ensure an even distribution of air across the heater surface. It is recommended to place the heater a minimum of 48" away from: (A) Elbow (B) Transition (C) Filter or Frame (D) Fan, as shown



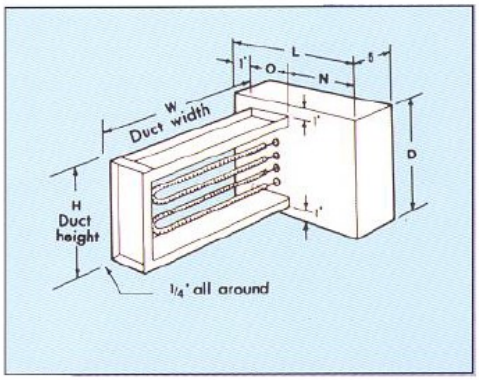
Airflow Terminology

All heaters are suitable for any airflow direction, horizontally, (right or left) and vertically (up or down) as shown. The term "Overhang" is referred to the extended portion of the terminal box of the heater.



Detailed Dimensions

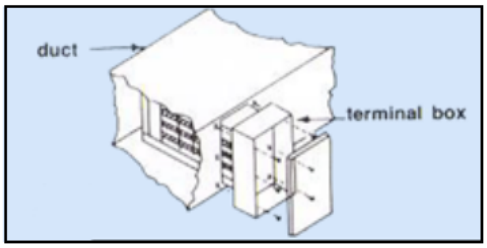
When requesting dimensional shop drawings, dimensions given in will be clearly detailed. All dimensions shown in numbers are standard and will be used while manufacturing unless otherwise requested by customer. Other dimensions may vary depending on duct size, arrangement and size of elements, etc.



INSTALLATION

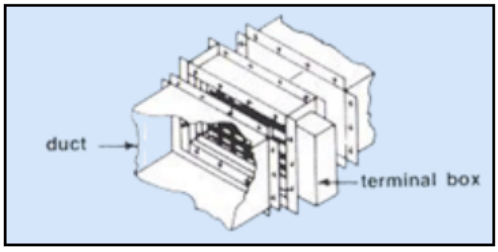
Slip in Heater Type

- Cut an opening of required size in the side Of duct.
- Insert heater until terminal box covers opening.
- Use terminal box to align the screwholes.
- Remove unit and drill holes.
- Secure heater in place with sheet metal Screw.



Flanged Type Heater

- Provide flanges on ends to ends of duct to match the size of heater flanges.
- Secure heater in place with sheet metal screws.



Rating & Standard Sizes

Airwellcare heaters are custom built to match your exact requirements, with respect to duct dimensions, wattage, voLtage, phase and number of stages. Tabled here under is our standard range for ready use and quick reference.

Single Phage Heaters		
KW	**Stage**	**Duct Size (Inch)**
1	1	15 x 10
1.25	1	17 x 10
1.5	1	20 x 10
2	1	25 x 10
3	1	32 x 10

Three Phage Heaters		
KW	**Stage**	**Duct Size (Inch)**
3	1	15 x 14
4.5	1	22 x 14
6	1	25 x 14
7.5	1	30 x 14
9	1	34 x 14
9	2	34 x 14
12	1	35 x 14
12	2	35 x 14
15	2	30 x 14
15	3	30 x 14
18	2	46 x 16
18	3	46 x 16

Electric Duct Heaters

Features & Advantages of Finned Tubular Heating Elements

- **Elimination of electric shock**

Accomplished by encasing the heating coil in a grounded metal sheath.

- **Easy Maintenance**

Incase of element failure it is easier to replace individually mounted finned tubular elements than open coil elements.

- **Continuous Operation**

Finned tubular elements will not short circuit due to dust or dirt built-up as it may possibly happen with open coil elements.

- **High Humidity**

Finned tubular element are designed not to short out due to water droplets carried by the air stream in the duct.

- **Rugged Structure**

Finned tubular elements are designated to withstand more physical and mechanical abuse.

- **Air Flow Uniformity**

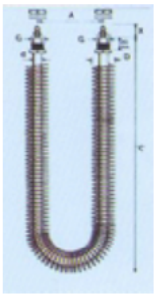
Heat conducted along the finned tubular element reduces or virtually eliminates hot spots resulting from non-uniform air flow through the duct.

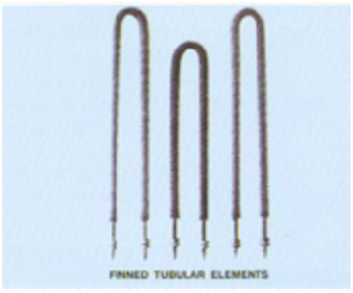
- **Controllability**

Outlet air temperatures are controlled more precisely when using finned tubular elements. Their greater thermal inertia increases the Life of the control components by reducing the rate at which they cycle.

- **Dimensions**

U-shaped elements come in two standards. Sheath diameter 8 mm and 11 mm. The physical dimensions of each type are common for all sizes with the exception of the vertical length which is dependent on the designated wattages of the element.





- **Application**

Suitable for any air heating process up to 400 C sheath temperature for mild steel elements and 800 C for stainless steel elements.

- **Construction**

Copper plated steel fins brazed to steel tubular sheath which includes an 80/20 nickel chrome resistance wire connected to terminal pins.

The tubular sheath is filled with high quality magnesium oxide compressed to ensure a rapid and even heat transfer.

The terminal pins form a non-heated section of the element . They are insulated from the sheath by ceramic bushes.

High temperature aluminium coating protects element surfaces from corrosion.

Element Sizes	
Watts	Approx. Length (Inches) 'c'
500	(9)
750	(9)
1000	(11)
1250	(14)
1500	(15)
1750	(19)
2000	(24)
2500	(29)
3000	(32)
4000	(33)
5000	(44)
6000	(44)

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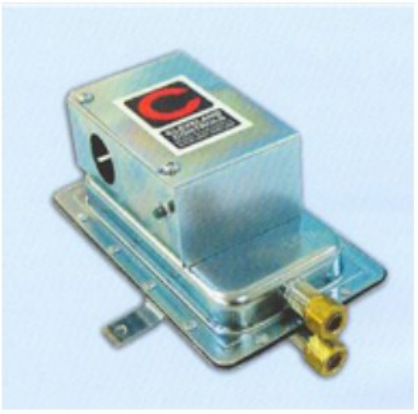
Standard Heater Electrical Components

Airflow Switch

A device which prevents the heater from operating unless the air is flowing. Its internal diaphragm senses the pressure difference between the inside and the outside of the duct which will close the circuit allowing the heater to startup.
It also has an extended copper tube in the air stream, making it sensitive to velocity, pressure as-well as static pressure. To ensure proper operation there must be at least 0.07"WG pressure difference between inside and the outside of the duct. The air flow switch has the advantage of detecting fan belt failure. Field wiring can be readily used with a built-in safety disconnect.



Magnetic Contactor

Once installed in the duct heater, they function as a device to energize heating circuit or to break all power lines. One operating contactor is required per stage provided that the line current for each stage does not exceed 48 Amps.

Automatic Thermal Cut Out

A disc type device which de-energize the heater at a pre-selected temperature and protect against overheating . Its bimetal disc is fully protected against moisture, dust or dirt. It automatically resets when temperature drops to a safe level. It serves as the primary safety cut-out.

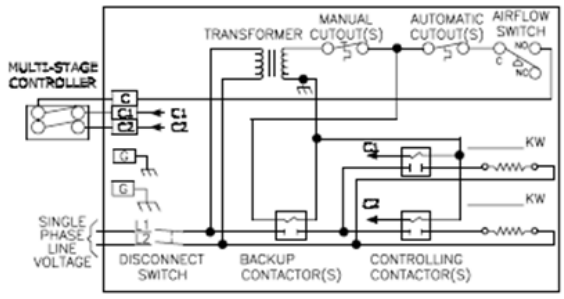
Manual Reset Thermal Cut Out

Designed to protect against failure of the primary cut-out where it opens at a higher temperature. Once the problem is resolved, it must be manually reset to re-energize the heater.

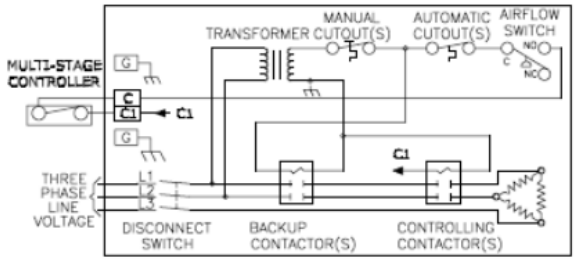
It serves as the secondary cut-out and it is usually wired in series with the primary, (see wiring diagrams).

Wiring Diagram - Finned Tubular

Multi Stages - Single Phase



Single Stage - 3 Phase



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