

ELECTRIC DUCT

# HEATER



FLIPPABLE  
EK SERIES SHOWN



RH SERIES  
RH-W SHOWN

RENEWAIRE ERV + ELECTRIC DUCT HEATER: A SINGLE-SOURCE SOLUTION

**RENEWAIRE EVERYWHERE**

EVERY GEOGRAPHY, EVERY CLIMATE, EVERY HOME,  
EVERY BUILDING AND EVERY APPLICATION

# RH SERIES

## ELECTRIC DUCT HEATER



RH-D (Integral Thermostat)



RH-W (Wall-Mount Thermostat)

Download specification at:  
[renewaire.com/specifications](http://renewaire.com/specifications)

Minimum Airflow (CFM)	Heater Capacity (kW)
30	1.00
60	2.00
90	3.00
120	4.00
150	5.00
180	6.00
240	8.00
300	10.00
345	11.50

## Electric Duct Heater (1-11.5 kW) Accessory



### SPECIFICATIONS

**Heater Type:**

Electric Duct Heater

**Typical KW Range:**

1-11.5 kW (1, 2, 3, 4, 5, 6, 8, 10, 11.5 kW)

**Voltages & Phase:**

Single phase - 120, 208 and 240V

**Control Voltage:**

24 VAC

**Controllable Output Temperature Range:**

RH-D: 32 to 108° F

RH-W: -3 to 130° F

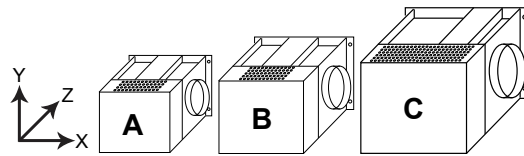
**Standard Features:**

- Open-coil element
- High-grade, nickel-chrome element wire
- Thermostat - Integral (RH-D),  
Wall mount (RH-W)
- Modulating heat output (SCR control)
- Vertical or horizontal operation
- Automatic limit switch for primary over-temperature protection
- Manual reset limit switch for secondary over-temperature protection
- Airflow sensor
- Standard control transformer - 24 VAC
- Corrosion-resistant galvanized steel
- Round duct collars
- High-voltage terminal block connections
- Grounding lug
- Mounting flanges

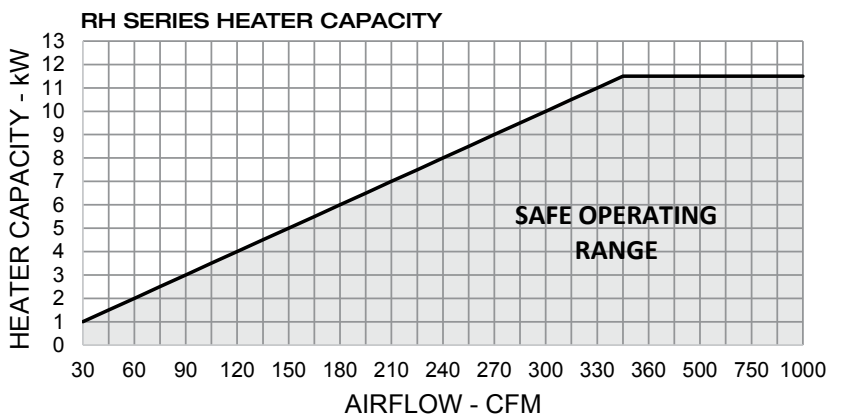
**Accessories:**

- Temperature sensor - Duct mount (DS-600)
- Digital time clock - wall mount (TC7D-W),  
in exterior enclosure (TC7D-E)
- Motion occupancy sensor/control -  
ceiling mount (MC-C), wall mount (MC-W)

**Note:** Electric duct heater designed for indoor ductwork installation only.



Duct Collars	kW	V	Size	Width (X)	Height (Y)	Depth (Z)	Max. Wt. (lbs.)
6"	1, 2	120, 208, 240	A	11 1/2"	8"	11 1/2"	10
8"	3, 4, 5	208	B	11 1/2"	10"	13 1/2"	15
8"	3, 4, 5, 6	240	B	11 1/2"	10"	13 1/2"	15
10"	3, 4, 5	208	B	11 1/2"	10"	13 1/2"	15
10"	3, 4, 5, 6	240	B	11 1/2"	10"	13 1/2"	15
10"	8, 10, 11.5	240	C	15 1/2"	12"	15 1/2"	20
12"	6, 8, 10, 11.5	240	C	15 1/2"	12"	15 1/2"	20



# ELECTRIC DUCT HEATER (1-175 KW)

RenewAire offers the highest-efficiency energy recovery ventilators (ERVs) on the market. However, during winter conditions, supply air from the ERV may be less than optimal for space conditions. By adding **CONFIGURABLE ELECTRIC DUCT HEATERS** as an option to our commercial ERVs, RenewAire can now heat supply air during cooler months to enhance indoor comfort, all via one package for ERVs and heaters from a single source.

## KEY BENEFITS

- **A single-source responsibility reduces time and costs:** A single information source, a single purchase point and a single approval package for ERVs and heaters reduces design time and costs, and streamlines logistics for design engineers and contractors.
- **Easy installation:** A ZERO clearance rating to combustibles allows designers and contractors to apply RenewAire heaters with less restrictions onsite.
- **Highly certified:** UL Listed (UL1996 Standard) and CSA certified.

## APPLICATIONS

RenewAire ERV and heater combinations can be applied anywhere ERVs are installed, with a focus on commercial and institutional buildings. However, VRF systems, hydronic panels and areas where non-ducted systems are applied offer an exclusive installation opportunity. RenewAire heaters can suit site restrictions in size, configuration or orientation, and can be **designed for preheat capabilities in certain extreme weather conditions.**

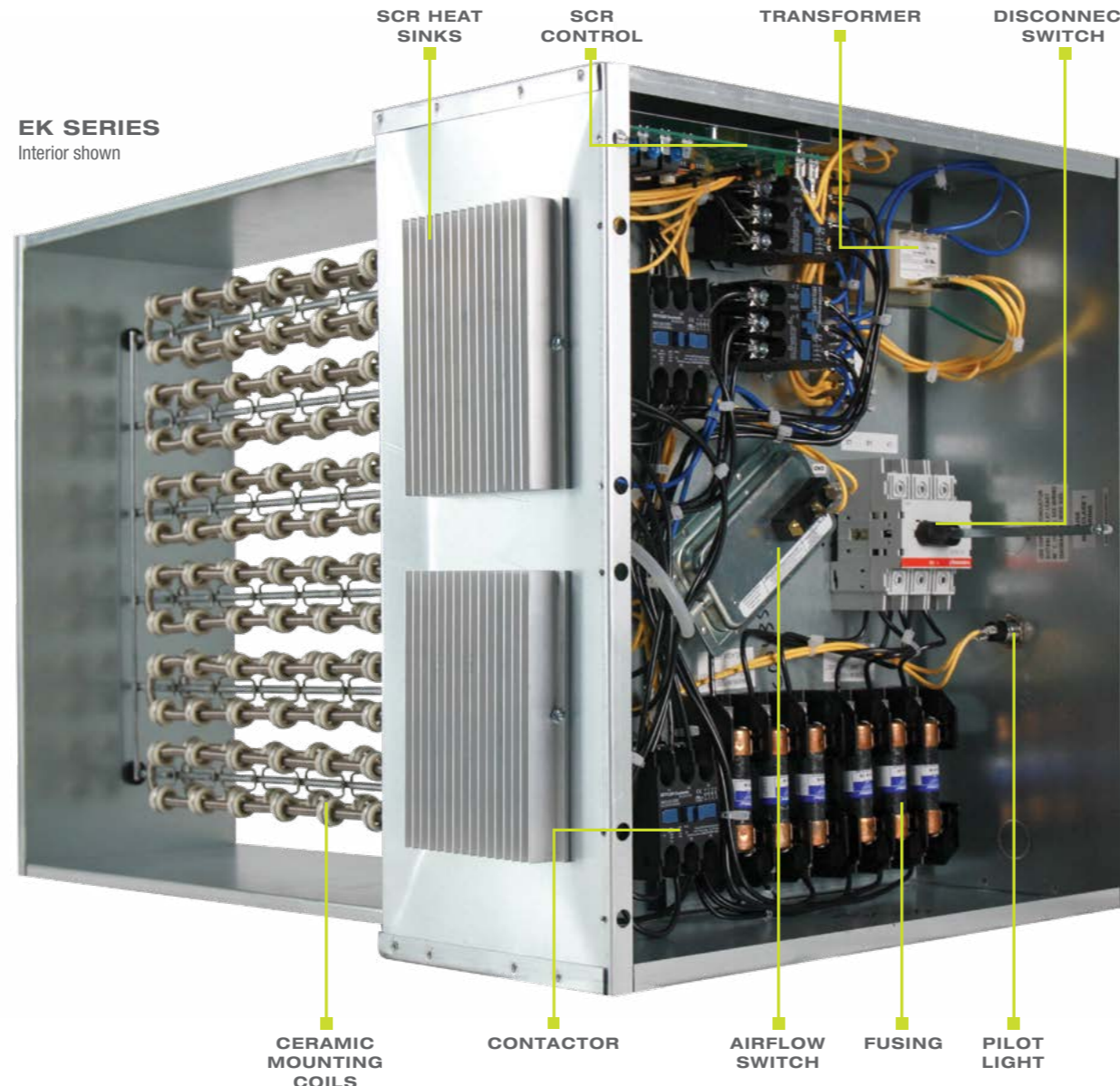
Other applications include existing installations that require additional heat, increased heat or simply replacement heaters. RenewAire heaters can be designed for 75°F comfort conditions, or warmer, and since ERV supply air is ducted into the space, tempering outdoor air for space conditions or **offering supplemental heat is easy and simple.**

RenewAire heaters are for indoor use only.

## MODELS

RenewAire EK heaters can be rotated 180°, and are capable of vertical up/down airflow.

EK SERIES (FLIPPABLE)	
Capacity	1-175 kW
Min. Duct Size (H x W)	8" x 8"
Max. Duct Size (H x W)	99" x 99"



## STANDARD FEATURES

- Open-coil element with slip-in mount installation
- Airflow switch
- Duct thermostat and duct sensor
- Disconnect switch, control terminal board and transformer
- Power fusing over 48 amps included
- Grounding lugs
- Left-hand offset control box
- A disconnecting magnetic control contactor per stage or each 48-amp circuit within a stage
- Automatic limit switch for primary over-temperature protection
- Manual reset limit switch for secondary over-temperature protection
- The wire rack element suspension system allows for a low-pressure drop across the coils with its aerodynamic design
- In horizontal applications, airflow can travel in either direction without any modification, allowing for easy field modifications
- Control-box features hinge and latch for easy access

## OPTIONS AND ACCESSORIES

### ELECTRONIC STEP CONTROLLER

Provides electronic sequencing control of an electric duct heater up to 4 steps. When interruption of power occurs, all the stages will recycle to off. Upon the restoration of power, re-energize the switches in a stepping sequence. Commonly used with a 2–10 vDC from a stand-alone T-stat, 2–10 vDC from a DDC building automation system and 4–20 mA from a building automation system.

### PILOT LIGHT

Side-panel installation for indicating heater is energized. Control voltage available as 24 volts.

### SCR CONTROLS

SCRs provide the finest in electric duct heater control with 100% step-less modulating control. Utilizes Solid State Relays (SSR) to switch current to the heating elements on a time-proportioned basis. Heaters with SCR controls have internal thermal protection to prevent overheating.

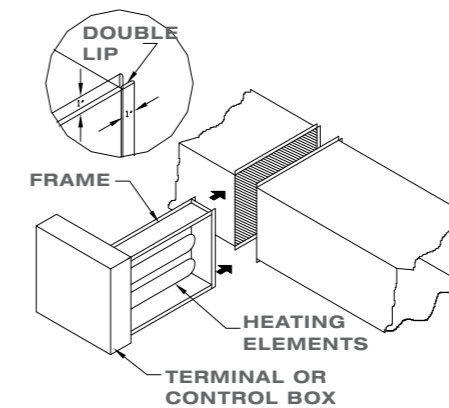
## CONSTRUCTION AND INSTALLATION

RenewAire heaters have been **designed to match our existing product offering** heat capacities that range from 1–175 kW and the ability to handle airflows from 200–11,000 CFM.

Our heaters are factory-assembled and wired for the electrical specialties and controls of each project, and can be installed as a slip-in or flanged configuration. The heaters are shipped loose, can be duct-installed onsite and are designed for post-installation if necessary. Heaters are wired with a **separate power source to be placed anywhere downstream of the ERV** or to be split to serve different areas with a single ERV.

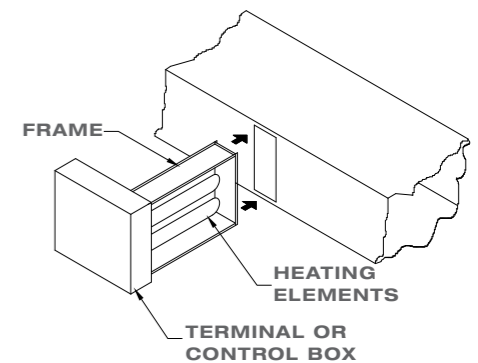
### FLANGE INSTALLATION

Installed by connecting the heater between two sections of flanged ductwork.



### SLIP-IN INSTALLATION

Installed by slipping the heater into a ductwork opening.



# ELECTRIC DUCT HEATER (1-11.5 KW)

SERIES RH

To provide maximum flexibility for achieving a comfortable indoor environment, we offer another heater unit. RenewAire's **ROUND ELECTRIC DUCT HEATERS** are the perfect complement to our Single/Multi-Family and light commercial ERVs since they deliver additional heating capacities and installation opportunities. RenewAire ERVs and round electric heater combinations can be applied anywhere residential and light commercial ERVs are installed.\*

## KEY BENEFITS

- **A single source reduces time and costs:** A single information source, a single purchase point and a single approval package for ERVs and heaters reduces design time and costs, and streamlines logistics for design engineers and contractors.
- **Easy installation:** A ZERO clearance rating to combustibles allows designers and contractors to apply RenewAire heaters with less restrictions onsite.
- **Highly certified:** CSA certified and evaluated to the applicable ANSI/UL and CSA Standards, for use in the U.S. and Canada.

## APPLICATIONS

RenewAire ERV and round electric heater combinations can be applied anywhere residential and light commercial ERVs are installed with 6", 8", 10" and/or 12" round ductwork. The varying kW sizes and single phase electric power offerings allow the round electric heaters to be applied to suit any project's requirements for supplemental electric heating. Other applications include existing installations that require additional heat, increased heat or simply replacement heaters.

RenewAire heaters can be designed for 75°F comfort conditions, or warmer, and since ERV supply air is ducted into the space, tempering outdoor air for space conditions or **offering supplemental heat is easy and simple.**

\*RenewAire heaters are for indoor use only.

## MODELS

RenewAire's RH series single-phase round electric duct are available in two models:

- **RH-D** (Integral Thermostat)
- **RH-W** (Wall-mount Thermostat)

RH SERIES	
Capacity	1-11.5 kW
Min. Duct Collar	6"
Max. Duct Collar	12"

## STANDARD FEATURES

- Open-coil element
- High-grade, nickel-chrome element wire
- Wall-mount thermostat (wall mount only)
- Temperature (duct) sensor (duct mount only)
- Modulating heat output (SCR control)
- Vertical or horizontal operation
- Automatic limit switch for primary over-temperature protection
- Manual reset limit switch for secondary over-temperature protection
- Airflow sensor
- Standard control transformer—24 VAC
- Corrosion-resistant galvanized steel
- Round duct collars
- High-voltage terminal block connections
- Grounding lug
- Mounting flanges

## ACCESSORIES

### REMOTE DUCT TEMPERATURE SENSOR (DS-600)

The sensor lowers the controllable output temperature range to -3–130° F from 50–130° F obtained using the internal sensor, provided standard in RH-W heater thermostats. The lower temperature range is commonly used for pre-heat applications. This remote sensor can also be used in RH-D heaters to control the output temperature at some distance from the RH-D heater.

### DIGITAL TIME CLOCK (TC7D-W OR TC7D-E)

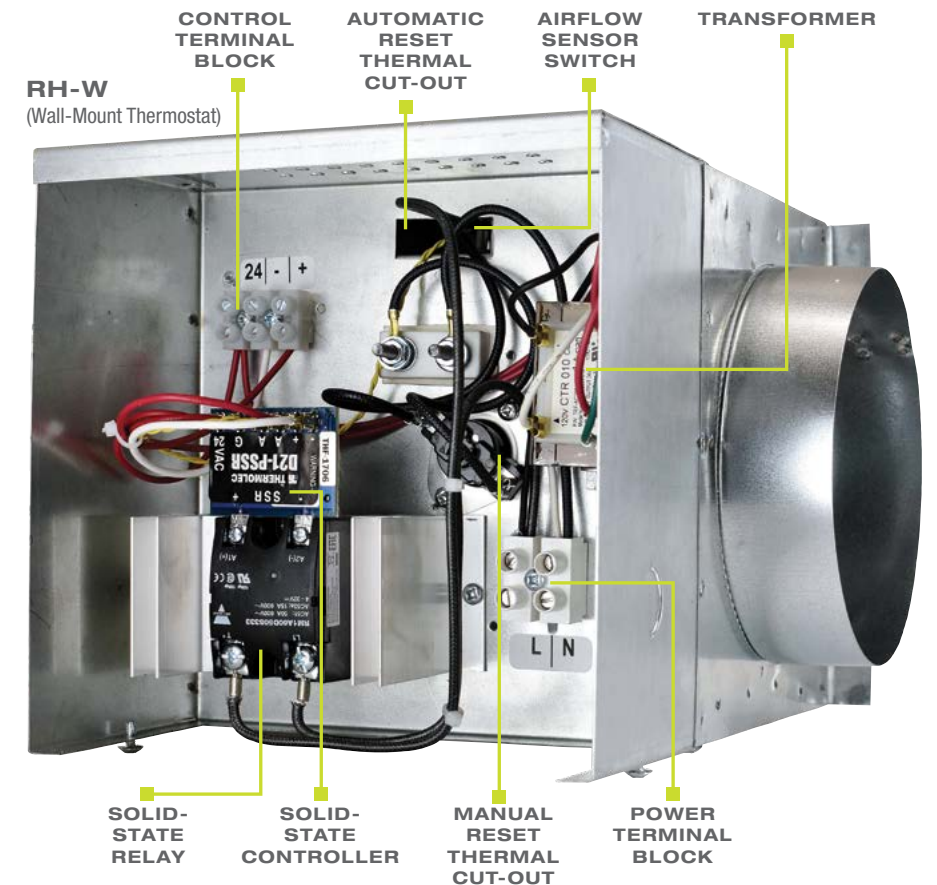
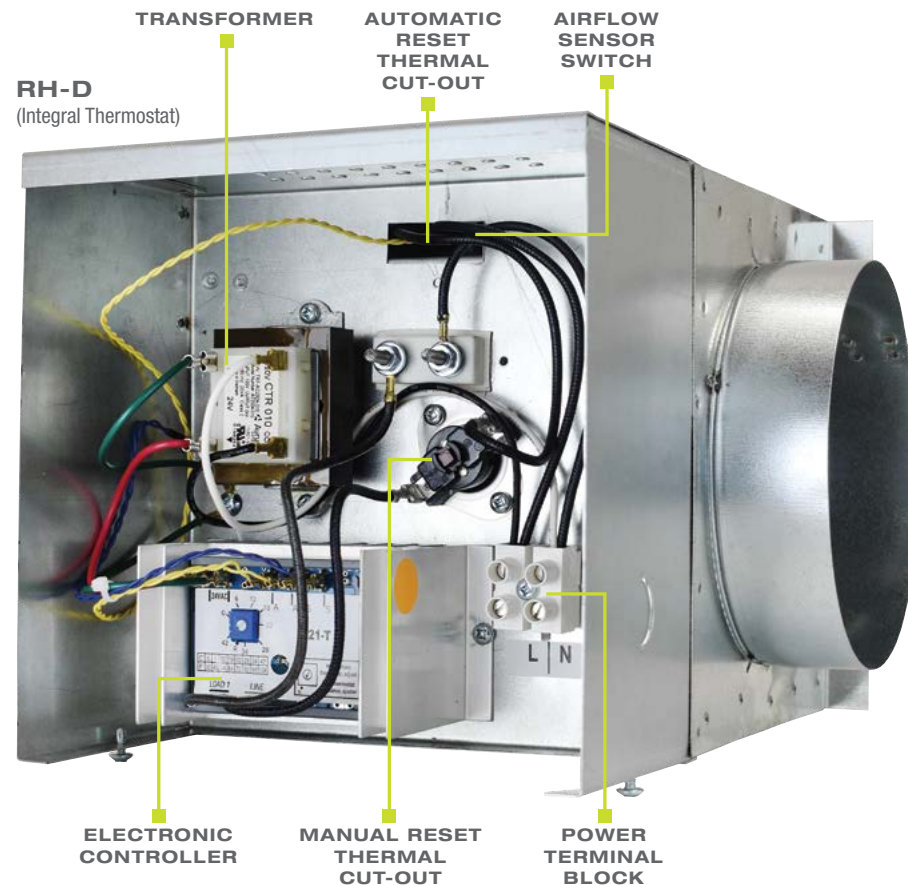
The time clock can be used to lower the set-point temperature by 8° F at scheduled times with a RH-W heater thermostat.

### MOTION OCCUPANCY SENSOR/CONTROL (MC-C OR MC-W)

The motion sensor can be used to lower the set-point temperature by 8° F when unoccupied with a RH-W heater thermostat.

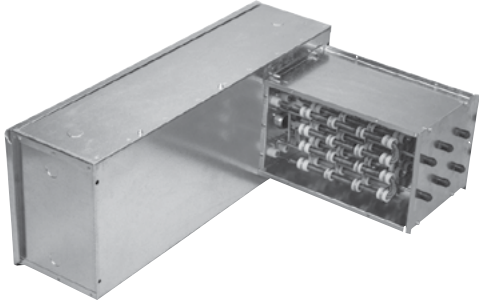
## CONSTRUCTION AND INSTALLATION

RenewAire RH series heaters complement RenewAire EK Series electric duct heater offering heat capacities that range from 1–11.5 kW for round-duct diameters from 6" to 12". They have the ability to handle airflows from 30–1,000 CFM. Each electric duct heater's unique design allows air to flow freely for the lowest possible pressure drop. Our heaters are factory-assembled and wired for the electrical specialties and controls of each project, and are available with round duct connection collars. The heaters are shipped loose, can be duct-installed onsite and are designed for post-installation if necessary. Heaters are wired with a **separate power source to be placed anywhere downstream of the ERV** or to be split to serve different areas with a single ERV.



# EK SERIES

## ELECTRIC DUCT HEATER



Download specification at:  
[renewaire.com/specifications](http://renewaire.com/specifications)

## Electric Duct Heater (1-175 kW) Accessory



### SPECIFICATIONS

#### Heater Type:

Electric Duct Heater

#### Typical KW Range:

1-175 kW

#### Standard Features:

- A disconnecting magnetic control contactor per stage or each 48 Amp circuit within a stage
- Open-coil element
- Staged on/off
- Control terminal board
- Grounding lugs
- Automatic limit switch for primary over-temperature protection
- Manual reset limit switch for secondary over-temperature protection
- Non-adjustable airflow switch
- Standard control transformer - 24 VAC
- Disconnect switch
- Duct thermostat with sensor for on/off control
- 60-20-20 (Ni/Cr/Fe) C Grade element wire with nickel-plated terminals
- Slip-in mount
- No left/right hand
- Vertical up/down flow

#### Voltages & Phase:

- Single phase - 120, 208, 240, 277
- Three phase - 208, 240, 480, 600

#### Control Voltage:

24 VAC

#### Dimensions:

- Minimum - 8" x 8" (W x H)
- Maximum - 99" x 99" (W x H)

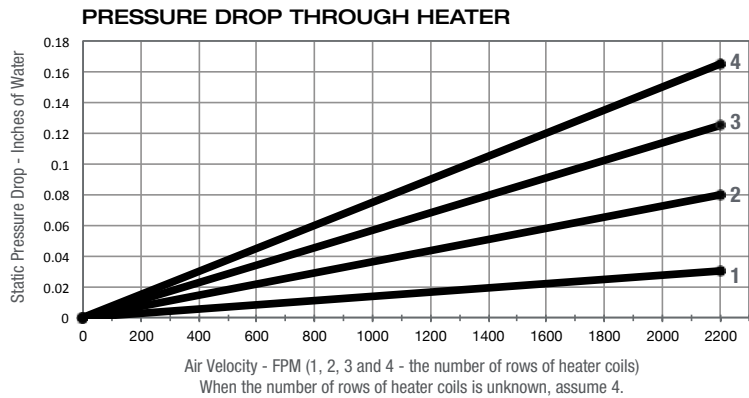
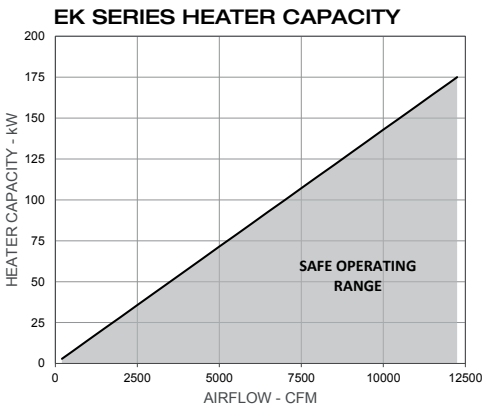
#### Options:

- Flange mount
- 80-20 (Ni/Cr) A Grade element wire with stainless steel terminals
- Recessed control box 1"
- Gasketed cover - dust tight
- Power fusing, standard for heaters drawing more than 48 Amps
- 2-stage
- Electronic step controller (4-stage)
- SCR (up to 96 Amps)
- SCR Vernier (over 96 Amps)
- Pilot light

#### Accessory:

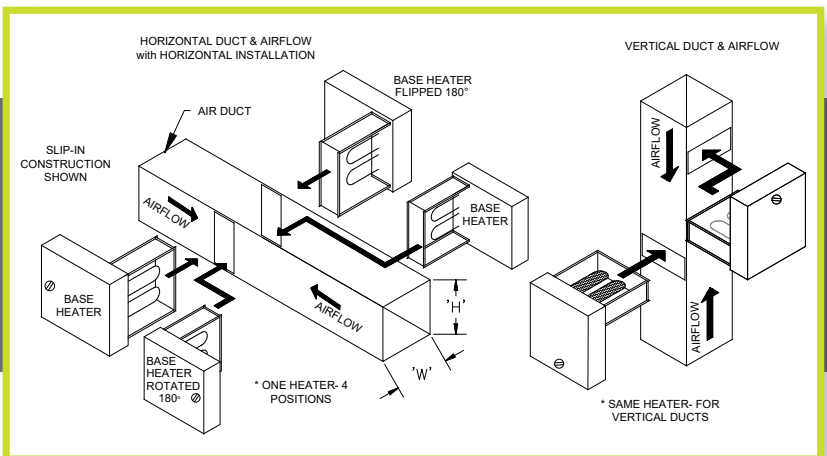
- Room thermostat
- Room/duct thermostat-sensor kit for SCR control

**Note:** Electric duct heater designed for indoor ductwork installation only.



## FLIPPABLE CAPABILITIES

Unique to the EK series, this unit has the ability to flip 180°. Additionally, EK heaters features both vertical up and vertical down airflow.



## EK SERIES

### DETERMINING MAXIMUM HEATER KW

#### Maximum Watts per Sq. In. of Duct Area

Duct width (inches) x duct height (inches) = duct area total in<sup>2</sup>.

$$\text{Max W} = X \left( \frac{\text{W}}{\text{in}^2} \right) \times \text{duct area in}^2 \quad \text{For EK, } X = 208.33 \left( \frac{\text{W}}{\text{in}^2} \right)$$

#### Maximum kW per Sq. Ft. of Duct Area

Duct width (feet) x duct height (feet) = duct area total ft<sup>2</sup>

$$\text{Max W} = X \left( \frac{\text{kW}}{\text{ft}^2} \right) \times \text{duct area ft}^2 \quad \text{For EK, } X = 30 \left( \frac{\text{kW}}{\text{ft}^2} \right)$$

### MINIMUM AIR VELOCITIES

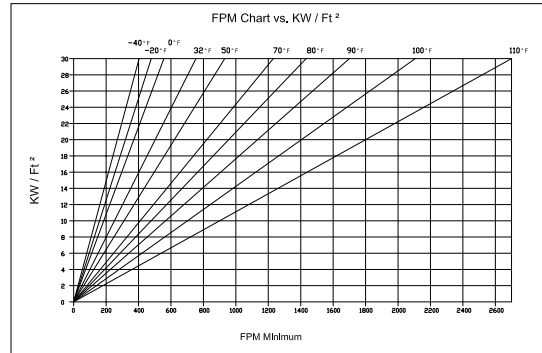
The minimum uniform airflow in a duct heater is directly related to the inlet air temperature. Consideration must be given to both airflow across the heater and inlet air temperature.

- To calculate the kilowatts per sq. ft. of duct area, divide the total kilowatts required by the duct area.

**Example:** Duct Size = 2ft. x 3ft. Total Kilowatts = 20  $20 \div 6 = 3.333 \text{ kW/sq. ft.}$

- If the air handler equipment is expressed in FPM, then a direct cross reference can be made by comparing the temperature of the air (as it enters the duct heater) to the kW rating on the chart of rated velocity (refer to chart at right).

- Draw a line horizontally from the kilowatt per sq. ft. required to the inlet air temperature being used.
- From this point of intersection on the inlet air curve, draw a line down vertically to establish the air velocity.
- The velocity should never be lower than the velocity as determined from the chart. In cases where this is not true, the velocity must be increased or the kW required must be reduced.



- In cases where the air handling equipment is expressed in CFM, then convert to FPM by dividing the CFM by the duct area.

**Example:** FPM = CFM ÷ Duct Area

## RH SERIES

### MINIMUM AIRFLOW AND AIR VELOCITIES

Minimum Airflow (CFM) = 30 (CFM) x Heater Capacity (kW)

**Example:** Heater Capacity = 4 kW  $30 \text{ CFM} \times 4 \text{ kW} = 120 \text{ CFM Minimum Airflow}$

Minimum Velocity = Minimum Airflow (CFM) ÷ Round Duct Area (ft<sup>2</sup>)

**Example:** Heater Capacity = 4 kW Area of 8" Round Duct Size = 0.349 ft<sup>2</sup>  
 $120 \text{ CFM Minimum Airflow} / 0.349 \text{ sq. ft. duct area} = 344 \text{ FPM minimum cross sectional velocity}$

### LINE CURRENT CALCULATION

Line Current (Amperes (A)) = Watts (W)/Line Voltage (V)

**Example:** 4 kW Heater = 4000 W Line Voltage = 240 V  $\text{Line Current} = 4000 \text{ W} / 240 \text{ V} = 16.7 \text{ A}$

## EK & RH SERIES

### KW AND TEMPERATURE RISE

The following formula may be used to determine the approximate total kW required when the CFM (air volume) and desired temperature rise (°F) are known:

$$\text{kW} = \frac{\text{CFM} \times \Delta T}{3150}$$

### DUCT HEATER TEMPERATURE RISE

The following formula may be used to determine the approximate temperature rise (°F) of a duct heater when the kW and CFM are known:

$$\Delta T = \frac{\text{kW} \times 3150}{\text{CFM}}$$