

ENGINEERING AND PERFORMANCE DATA

Since an electric duct heater has a constant BTU/H output as long as the heater is energized, a minimum air velocity must be maintained through the heater. Proper air flow will prevent over-temperature causing nuisance tripping and will maintain element life expectancy. The velocity of air flow in the duct is determined by the formula:

$$\text{VELOCITY} = \text{CFM} \div \text{DUCT AREA}$$

In addition, the minimum air flow velocity is indicated on each heater.

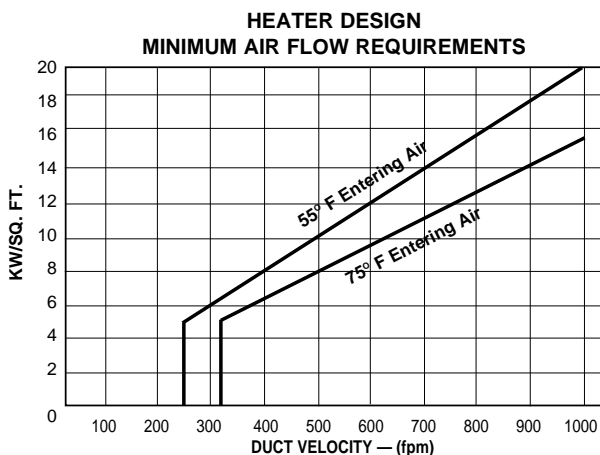
The electric heaters are suitable for zero clearance between the heater and combustible material. Electric heaters are shipped uninsulated with slip-in or flange connections for easy installation into duct work.

The inlet and outlet air temperature should be selected within the temperature limitations of the heater. The maximum discharge air temperature is 120°F. The electric heater is an open coil design and should be mounted in a horizontal position maintaining proper air flow direction.

The minimum air velocity through the electric heater based on the duct area (ft²) is determined by:

$$\text{Vfpm} = \frac{\text{KW} \times 3160}{\text{Area} \times (T_2 - T_1)}$$

- Vfpm** = Minimum air velocity
- Area** = Sq. Ft. of duct area
- KW** = Kilowatt of Heater
- T₂** = Discharge air (120°F Max.)
- T₁** = Entering Air Temperature



1. Conversion: **1 KW = 3413 Btu/h**
2. Load Requirement: **KW = $\frac{\text{Cubic Feet Per Min.} \times \text{Temperature Rise}}{3160}$**
3. *Temperature Rise: **TR = $\frac{\text{KW} \times 3160}{\text{Cubic Feet per Min.}}$**
4. Ohm's Law: **Watts = $\frac{(\text{Volts})^2}{\text{Resistance}}$ = Volts x Amps**
5. Line Current, 1 Phase: **Amps = $\frac{\text{Watts}}{\text{Volts}}$**
6. Line Current, 3 Phase: **Amps = $\frac{\text{Watts}}{1.73 \times \text{Volts}}$**
7. Pressure Drop: **Inches H₂O = $\frac{\text{KW/ft}^2}{760} \times \left[\frac{\text{Velocity in FPM}}{500} \right]^2$**
8. Maximum Discharge Air Temperature = 120°F

** Maximum heater discharge temperature should not exceed 120°F.*

Electric Coils

Max. and Min. Allowable Electric Heater KW for Single Duct Terminal Units

1 Phase Line Voltage Heaters

AVED SIZE		MIN. KW	05/06	07/08	10	12	14	16	18/24
COIL CODE			A	B	F	H	L	M	T
120 VOLT 1 PHASE	1 STEP	.5	5.6	5.6	5.6	5.6	5.6	5.6	5.6
	2 STEPS	.8	5.6	5.6	5.6	5.6	5.6	5.6	5.6
	3 STEPS	1.3	5.6	5.6	5.6	5.6	5.6	5.6	5.6
MAXIMUM HEATER KW									
208 VOLT 1 PHASE	1 STEP	.8	6.1	8.1	9.8	9.8	9.8	9.8	9.8
	2 STEPS	1.3	6.1	8.1	9.8	9.8	9.8	9.8	9.8
	3 STEPS	2.0	6.1	8.1	9.8	9.8	9.8	9.8	9.8
MAXIMUM HEATER KW									
240 VOLT 1 PHASE	1 STEP	.8	6.1	8.1	11.5	11.5	11.5	11.5	11.5
	2 STEPS	1.5	6.1	8.1	11.5	11.5	11.5	11.5	11.5
	3 STEPS	2.4	6.1	8.1	11.5	11.5	11.5	11.5	11.5
MAXIMUM HEATER KW									
277 VOLT 1 PHASE	1 STEP	.9	6.1	8.1	11.8	12.9	12.9	12.9	12.9
	2 STEPS	1.8	6.1	8.1	11.8	12.9	12.9	12.9	12.9
	3 STEPS	2.7	6.1	8.1	11.8	12.9	12.9	12.9	12.9
MAXIMUM HEATER KW									
347 VOLT 1 PHASE	1 STEP	1.1	6.1	8.1	11.8	16.2	16.6	16.6	16.6
	2 STEPS	2.2	6.1	8.1	11.8	16.2	16.6	16.6	16.6
	3 STEPS	3.3	NA	8.1	11.8	16.2	16.6	16.6	16.6
MAXIMUM HEATER KW									
480 VOLT 1 PHASE	1 STEP	1.5	6.1	8.1	11.8	16.2	23.0	23.0	23.0
	2 STEPS	3.0	NA	8.1	11.8	16.2	23.0	23.0	23.0
	3 STEPS	4.5	NA	8.1	11.8	16.2	23.0	23.0	23.0
MAXIMUM HEATER KW									
600 VOLT 1 PHASE	1 STEP	1.8	6.1	8.1	11.8	16.2	23.7	28.4	28.8
	2 STEPS	3.7	6.1	8.1	11.8	16.2	23.7	28.4	28.8
	3 STEPS	5.6	6.1	8.1	11.8	16.2	23.7	28.4	28.8
MAXIMUM HEATER KW									

3 Phase Line Voltage Heaters

AVED SIZE		MIN. KW	05/06	07/08	10	12	14	16	18/24
COIL CODE			A	B	F	H	L	M	T
208 VOLT 3 PHASE	1 STEP	1.3	6.1	8.1	11.8	16.2	17.2	17.2	17.2
	2 STEPS	2.4	N/A	8.1	11.8	16.2	17.2	17.2	17.2
	3 STEPS	3.5	N/A	N/A	11.8	16.2	17.2	17.2	17.2
MAXIMUM HEATER KW									
240 VOLT 3 PHASE	1 STEP	1.3	6.1	8.1	11.8	16.2	19.9	19.9	19.9
	2 STEPS	2.6	N/A	8.1	11.8	16.2	19.9	19.9	19.9
	3 STEPS	4.0	N/A	N/A	11.8	16.2	19.9	19.9	19.9
MAXIMUM HEATER KW									
480 VOLT 3 PHASE	1 STEP	2.7	6.1	8.1	11.8	16.2	23.7	28.4	37.9
	2 STEPS	5.4	N/A	8.1	11.8	16.2	23.7	28.4	37.9
	3 STEPS	8.1	N/A	N/A	NA	16.2	23.7	28.4	37.9
MAXIMUM HEATER KW									
600 VOLT 3 PHASE	1 STEP	3.2	6.1	8.1	11.8	16.2	23.7	28.4	37.9
	2 STEPS	6.5	N/A	8.1	11.8	16.2	23.7	28.4	37.9
	3 STEPS	9.7	N/A	N/A	11.8	16.2	23.7	28.4	37.9
MAXIMUM HEATER KW									

Maximum and Minimum Allowable Electric Heater KW for Models ASE and ACE Fan Terminal Units

ACEJ, ACEH, ASEH FAN SIZE		--	--	--	A, B, C, D	E, F**	ASEH (14/16 E, F) & ACEJ (G)	H, J	U1/L1 - U4/L4	U5/ L5 - L6	
ACEQ FAN SIZE		A, B, C	D	E, F	--	--	--	--	--	--	
COIL CODE		C	E	J	D	J	N	R	G	K	
VOLTAGE/PHASE		Min. KW PER STEP	MAXIMUM HEATER KW								
HEATER	FAN										
120/1	120/1	.5	5.5	5.1	4.9	5.5	4.9	4.6	3.3	5.7	5.7
277/1	277/1	.9	9.5	11.9	12.5	13.0	12.5	11.6	11.6	8.1	11.8
208/3	120/1	1.3	9.5	11.9	14.8	13.2	14.8	14.0	10.0	8.1	11.8
480/3	277/1	2.7	9.5	11.9	16.3	13.2	16.3	34.4	33.2	8.1	11.8

** Not for AS 14/16 fan sizes E,F.

- NOTES:**
1. Maximum heater discharge temperature should not exceed 120°F.
 2. Discharge temperature = [(KW x 3160)/CFM] + entering air temperature (EAT).
 3. Contact factory for heater/fan combinations not listed.