

APPLICATION DATA

HIGH ELEVATION UNIT PERFORMANCE FACTORS

Supersedes: 690.02-AD1V (591)

690.02-AD1V (0403)

COOLING, HEATING & BLOWER PERFORMANCE DERATE FACTORS FOR UNIT INSTALLATIONS AT ELEVATIONS 2,000 TO 10,000 FEET

GENERAL

Whenever a unit is to be installed at an elevation of 2000 feet or more, its performance should be derated using the appropriate factors shown in Table 1.

An example showing the effects of high elevations on a typical unit using the derate factors presented in this publication is shown in Table 2.

GAS HEAT CAPACITIES

Determine the gas heat capacities of the unit from the data provided in the respective unit technical guide, and derate these capacities with the appropriate factor shown in Table 1.

COOLING CAPACITIES

Determine the rating points of the unit from the capacity tables in the respective unit technical guide, based on the actual supply air CFM at the site elevation, and derate the ratings with the appropriate factors shown in Table 1. Do **NOT** reduce the CFM to its equivalent sea level value before using the data provided in the table.

BLOWER PERFORMANCE

Determine the rating points of the unit from the blower performance tables in the respective unit technical guide, based on the following conditions, and derate these ratings with the appropriate factor shown in Table 1.

1. Supply Air CFM at the site elevation, and
2. External static resistance at sea level. Include the resistance of any economizer and/or electric heat option or accessory that will be added to the unit.

If the external static resistance is specified at the site elevation, divide this resistance by the appropriate factor shown in Table 1 to determine the higher equivalent resistance at sea level.

EXAMPLE

The following example shows how a typical unit will be effected by elevation above sea level using the derate factors listed in Table 1. Refer to Table 2 for a rating comparison. 4 Ton Gas Heating Unit @ 125 MBH Input and 460-3-60 Volts
1,800 CFM @ 0.50" ESP 77/62°F entering air 95°F ambient

TABLE 2 - RATING COMPARISON EXAMPLE

| Ratings | | Elevation | |
|-------------------|----------------|-----------|------------|
| | | Sea Level | 5,000 Feet |
| Cooling | MBH (Total) | 47.0 | 45.7 |
| | MBH (Sensible) | 42.0 | 36.1 |
| | KW | 4.6 | 4.5 |
| Heating | MBH (Input) | 125 | 110 |
| | MBH (Output) | 101 | 89 |
| Supply Air Blower | Speed | Hi | Hi |
| | Watts | 880 | 732 |

TABLE 1 - DERATE FACTORS

| ELEVATION (Feet) | CAPACITY FACTORS | | | | BLOWER PERF. FACTORS |
|------------------|------------------|-------------|----------------|-------|----------------------|
| | GAS HEAT | COOLING | | | |
| | Input/Output | MBH (Total) | MBH (Sensible) | KW | BHP, KW, ESP |
| 0 - 2,000 | 1.00 | 1.000 | 0.944 | 1.000 | 0.926 |
| 2,001 - 3,000 | 0.92 | 0.991 | 0.916 | 0.991 | 0.893 |
| 3,001 - 4,000 | 0.88 | 0.982 | 0.888 | 0.982 | 0.862 |
| 4,001 - 5,000 | 0.84 | 0.973 | 0.860 | 0.973 | 0.832 |
| 5,001 - 6,000 | 0.80 | 0.964 | 0.832 | 0.964 | 0.800 |
| 6,001 - 7,000 | 0.76 | 0.955 | 0.804 | 0.955 | 0.769 |
| 7,001 - 8,000 | 0.72 | 0.946 | 0.776 | 0.946 | 0.741 |
| 8,001 - 9,000 | 0.68 | 0.937 | 0.748 | 0.937 | 0.714 |
| 9,001 - 10,000 | 0.64 | 0.928 | 0.720 | 0.928 | 0.690 |

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