

VRF Engineering Bulletin

Airstage Heat Pumps used at High Altitudes

When air conditioners and heat pumps are installed in areas above sea level, capacity is reduced due to decreased air density. Equipment size must be increased to meet the load requirements. The following correction factors apply to Fujitsu Airstage heat pumps for both heating and cooling operation. The indoor and outdoor units need to be sized based on the capacity deduction due to decreased air density.

Examples:

An air source system installed at 5,000 feet above sea level would operate at 83% its normal capacity when compared to its performance at sea level. Therefore, the indoor unit(s) and outdoor unit(s) need to have at least 17% higher capacity to provide the same cooling and heating performance as the units would at sea level conditions.

Altitude Feet Above Sea Level	Correction Factor
0	1
1,000	0.96
2,000	0.93
3,000	0.9
4,000	0.86
5,000	0.83
6,000	0.8
7,000	0.77
8,000	0.74
9,000	0.71
10,000	0.69

For example:

A 72,000 Btu/h VRF system installed 8,000 feet above sea level would operate at 74% of its sea level capacity. At 8,000 feet, this system would be capable of delivering 53,280 Btu/h of heating or cooling. ($72,000 * 0.74 = 53,280$)

If greater capacity is required in the space, the outdoor and indoor units would need to be sized larger. For example, a 96,000 Btu/h unit would deliver almost 72,000 Btu/h. ($96,000 * 0.74 = 71,040$)

Note: The size of both the indoor units and the outdoor units must be increased for high altitude applications.