



# Tech Note:

## Derating Requirements for Harmonic Filters

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### Altitude exceeding 3300 feet (1000 meters)

Standard PQC harmonic filters are designed for use at altitudes ranging from sea level to 3300 feet (1000 meters). Whenever our harmonic filters are required to serve an application at any altitude above 3300 feet (1000 meters) and up to a maximum of 15,000 feet elevation, they must either be electrically derated based on the current rating, or else the ambient temperature must be sufficiently reduced. Refer to the following charts for derating information.

The following derating charts apply to harmonic filters, not motor protection Sine Wave Filters. Please consult with factory application engineers for (SWF) sine wave filter derating requirements.

### Derate current when altitude exceeds 3300 feet (1000 meters):

When operating PQC harmonic filters in environments where the elevation above sea level exceeds 3300 feet (1000 meters), the maximum continuous current rating of the equipment must be reduced by applying the following derating factors to the filter rated current. Multiply equipment rated current by the "Current Factor" to determine the maximum continuous current under these conditions.

Feet above sea level	Meters above sea level	Current Factor
3300	1000	1.000
4000	1212	0.9925
5000	1515	0.9850
6000	1818	0.9775
7000	2121	0.9700
8000	2424	0.9550
9000	2727	0.9475
10,000	3030	0.9400
11,000	3333	0.9325
12,000	3636	0.9250
13,000	3939	0.9100
14,000	4242	0.9025
15,000	4545	0.8900

### Reduce ambient temperature when altitude exceeds 3300 feet (1000 meters):

When operating PQC harmonic filters in environments where the elevation above sea level exceeds 3300 feet (1000 meters), the equipment may be operated at its rated continuous current provided that the ambient temperature is reduced in accordance with the following chart. Multiply the rated ambient temperature by the "Ambient Temperature Factor".

Feet above sea level	Meters above sea level	Ambient Temperature Factor
3300	1000	1.000
4000	1212	0.985
5000	1515	0.970
6000	1818	0.955
7000	2121	0.935
8000	2424	0.912
9000	2727	0.898
10,000	3030	0.880
11,000	3333	0.865
12,000	3636	0.845
13,000	3939	0.820
14,000	4242	0.808
15,000	4545	0.790



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### Ambient temperature exceeding 50 degrees Celsius

Standard PQC harmonic filters are suitable for use in ambient temperature of 50 degrees Celsius or less. Whenever our harmonic filters are required to serve an application where the ambient temperature will exceed 50C, the equipment rated current must be sufficiently reduced per the following chart.

Ambient Temperature	Ambient Temperature Factor
40 C	1.000
45 C	1.000
50 C	1.000
51 C	0.960
52 C	0.925
53 C	0.890
54 C	0.857
55 C	0.825
56 C	0.797
57 C	0.770
58 C	0.745
59 C	0.718
60 C	0.700

**NOTE:** Operating harmonic filters, transformers, electric motors and other electrical equipment at high altitude or high ambient conditions, without applying the appropriate derating factors, will severely reduce the life expectancy of the equipment. For each increase of 10 degrees Celsius in operating temperature electrical equipment life is reduced by 50 percent.