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APPLICATION NOTE

# High Altitude Installations – Low Voltage Dry Type Transformers

**600 V Class Type QL Ventilated (Class AA cooling/self-cooled) Low-Voltage Dry-Type Transformers have limits with regards to the installation site altitude. Derating of certain transformer parameters may be required for optimal and consistent product performance.**

Transformers are designed in accordance with industry standards to operate at altitudes of 1000 m/3281 feet or below (IEEE std. C57.96). Decrease in airflow density above this elevation level results in decreased cooling efficiency and increased transformer temperature rises.

The formula for de-rating a ventilated dry type transformers installed in elevations above 1000 meters (3281 feet) is as follows:

Transformers operated at altitudes above 1000 meters (3280 feet) should be de-rated 0.3 *per cent for each 100 meters* (328 feet) over 1000 meters. A transformer for application 2250 meters above sea level (MASL) for example, should be de-rated by 3.75 per cent or loaded to only 96 per cent of its rating.

Example:

Installation at 2600 meters (8530 feet) – 1000 m (3281 ft) = 1600;  $1600/100 = 16$ ;  $(16 * 0.003) * 100 = 4.8\%$  or loaded to only 95% of its nameplate kVA rating.

Regardless of the de-rating formula, ABB Low Voltage Dry Type Transformers should not be installed at elevations of 4500 meters (14,763 feet) or more.