



WALMER ENERGY

# The impact of high frequency on inverter





## Overview

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Does a high switching frequency increase the efficiency of an inverter?

On the other hand, a high switching frequency leads to heightened efficiency in PMSMs and decreases that of the inverter. However, from the perspective of the entire system (inverter + PMSM), the total efficiency increases with the higher fundamental frequency.

What is inverter frequency?

In today's world, inverters play a vital role in various applications, such as home solar power system, inverter for office use, inverter for van, etc. Central to their operation is the concept of an inverter frequency, which determines the rate at which the current alternates direction.

Do high frequency harmonics increase Eddy loss in a PV inverter?

Simulation and practical results have evaluated this factor in different conditions. Current harmonics higher than 2 kHz from PV inverter highly contribute in  $K_f$  value. Field measurements show that high-frequency harmonics can increase eddy losses by 33%. The loss due to higher frequency harmonics causes 22% acceleration in ageing.

What factors affect inverter frequency?

Several factors influence the inverter frequency, including the design of the power electronics, the configuration of the control circuitry, and the specifications of the utility grid. In grid-tied inverters, for instance, the inverter frequency is typically synchronized with the utility grid to ensure compatibility and seamless energy transfer.



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