ANALYSIS OF BUCK CONVERTER USING POWER FACTOR PREREGULATOR MATLAB SIMULINK

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Abstract:
Buck-type converters are analyzed for application as which the IEC 1000-3-2 gauges are met is figured power component preregulators. Two step-down converters are proposed, which agree to EMC principles on account of a helper fly back stage which employs the same switches of the primary converter in addition to a little power switch commutated at the line recurrence. With legitimate outline, the voltage anxiety of the primary switch continues as before with respect to a customary buck topology. Recreations and trial results are accounted for to approve the hypothetical investigation.

Keywords: Preregulator, Buck converter, Fly back, Mat lab Simulink.

I. Introduction
In ac-to- dc conversion, device having a rated modern less than 16A/phase must compare with IEC a 1000-3-2 widespread which limits the harmonic content of the modern absorbed from the mains [1]. For this cause, many converter topologies have been analyzed within the literature for use as energy thing preregulators i.e. to provide nearly sinusoidal modern absorption and regulated dc output voltage [2-5]. Among them, the maximum popular is without a doubt the raise preregulator, which offers the following advantages: simplicity, inherent input modern-day filtering due to the input inductance, almost harmony energy element while running in CCM with average modern mode control [5]. still, it has a few drawbacks, particularly, no hindrance of the inrush present day at begin-up, loss of quick-circuit safety and output voltage greater than height enter voltage (VO= 380-400V for frequent enter voltage range). Those barriers can be triumph over by means of using a greenback-kind preregulator which but, shows a pulsed input modern-day and some line contemporary distortion, due to the notches round zero crossing of the road voltage. Despite the fact that, on the grounds that EC 1-3-2 requirements permit a certain quantity of line modern-
day distortion [1,6], normally a strength variety exists in which the buck-kind preregulator meets the standards. This power variety is calculated, inside the first a part of the paper, for different voltage conversion ratios and modulation strategies. Inside the 2d component, step-down topologies are proposed which encompass a chief buck converter and auxiliary fly back stage. This latter is used to take in cutting-edge even all through the time durations wherein the principle greenback converter is inactive. on this way, the enter modern-day distortion is reduced, thus growing the beneficial energy variety. Otherwise from the scheme proposed in [7], the fly back degree uses the identical switches of the main converter for the modulation and calls for handiest additional line-frequency commutated stitches. Moreover, this auxiliary converter is rated for a fraction of the overall energy. Ultimately, simulation and experimental effects are stated which the

II. The Buck-Type Preregulator

The basic scheme of a buck converter used as a Preregulator is shown in Fig. 1. It consists of a diode bridge rectifier followed by a standard buck converter.

As in buck-type preregulator, the output capacitor filters out the low-frequency components of the enter power. However, unlike the buck converter, the converter shown in Fig. 1 is able to draw contemporary from the line most effective while the input voltage is greater than the output voltage. As a zero outcome, notches seem inside the line contemporary around zero crossing of the line voltage, causing distortion.
Matlab simulation diagram for buck converter using pre-regulator:

**Fig. 2**: simulation circuit for buck converter using preregulator.

Matlab Result:

**Fig. 2.** Output for rectifier.

**Fig. 3**: Circuit diagram for rectifier.
Simulation Result:

Fig.4. Output for rectifier.

Reference

