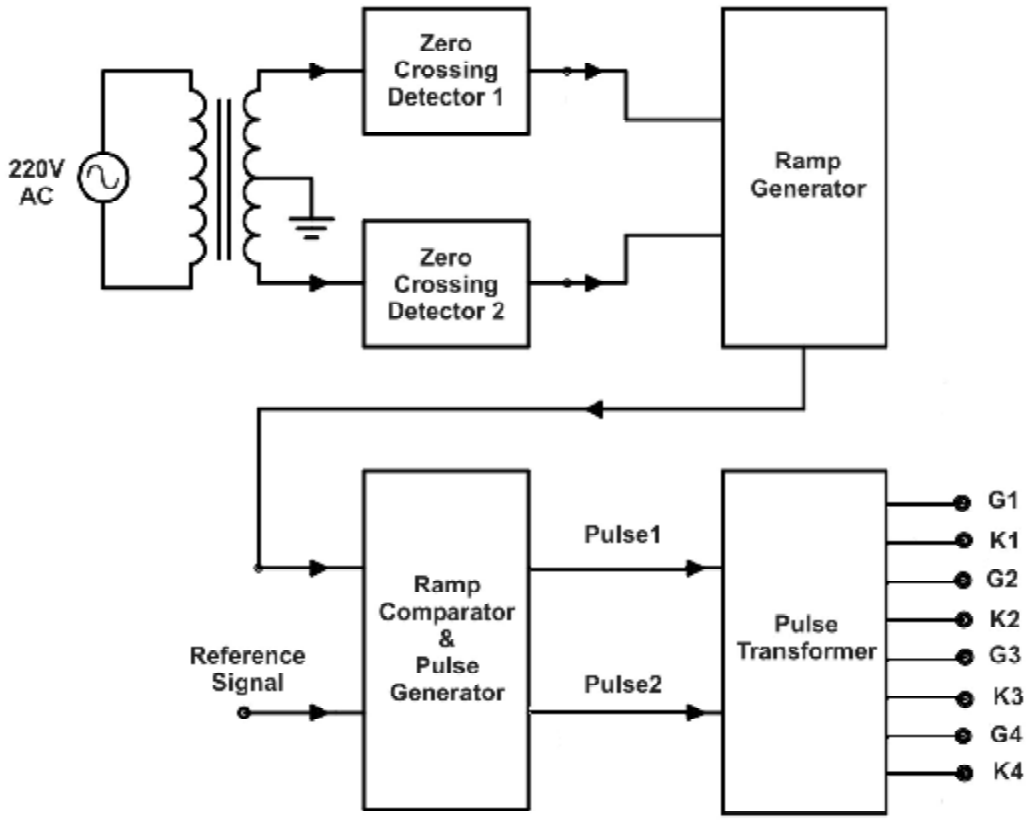
Ramp Comparator Firing Circuit

A general block diagram of **Ramp Comparator Firing Scheme** gate trigger circuit for single-phase converter is shown in figure. The gating circuit consists of synchronizing transformer, zero crossing detectors, ramp generator, ramp comparator, pulse transformer.



Synchronize Signal:

The main function of the synchronizing circuit is to derive low voltage signals to the control circuit which operates at low voltages. These low voltage signals must be synchronized to the voltages supplied to the main power circuit. Step down transformers may be used for this purpose with filter circuit to avoid waveform distortion if any.

Zero Cross Detector:

The main function of the zero cross detector is to convert synchronize signal to square wave signal.

Ramp Generator:

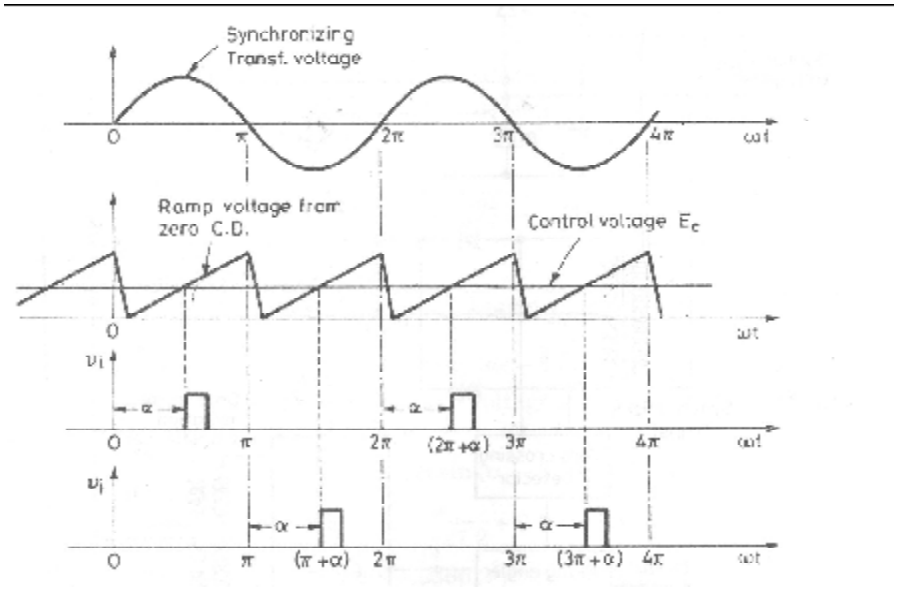
The main function of this section is to generate the ramp signal using the zero cross detector output.

Ramp Comparator:

The main function of this section is to compares the ramp signal with the reference voltage signal and generates the gate signal with variable angle.

Pulse Transformer:

The pulse transformer section provides isolation between firing circuit and the power circuit circuit.



Firing angle in time is

$\alpha = (180 \times T) / 10ms$ ……**(10)**

So,

$T = (\alpha \times 10ms) / 180$ ……..**(11)**

Where, time T in ms

And ,

$V_{RMS} = V_M / \sqrt{2}$ ……**(12)**

Then,

$V_M = \sqrt{2} \times V_{RMS}$ ……**(13)**