

## **Experiment No: 06**

**Experiment Name :** Simulation of 1 phase cyclo-converter (input = 50HZ output = 50/3 Hz)

### **Objectives:**

- To learn about cycloconverter
- To learn about Input and output voltage of cycloconverter

### **Theory:**

A cycloconverter (CCV) or a cycloinverter converts a constant voltage, constant frequency AC waveform to another AC waveform of a lower frequency by synthesizing the output waveform from segments of the AC supply without an intermediate DC link. A cycloconverter (CCV) is basically a one-stage frequency changer. Here, one stage conversion means that input AC supply is directly converted to variable frequency output with the use of power electronic switches such as thyristors. In a 1- $\phi$  Cycloconverter, the output frequency is less than the supply frequency. This converter consists of back-to-back connection of two full-wave rectifier circuits.

### **Equipment:**

1. Matlab Simulink
2. Ideal Switch
3. AC voltage Source
4. Thyristor
5. Pulse Generator
6. Scope
7. Resistor (100 ohm)

## Circuit Diagram:

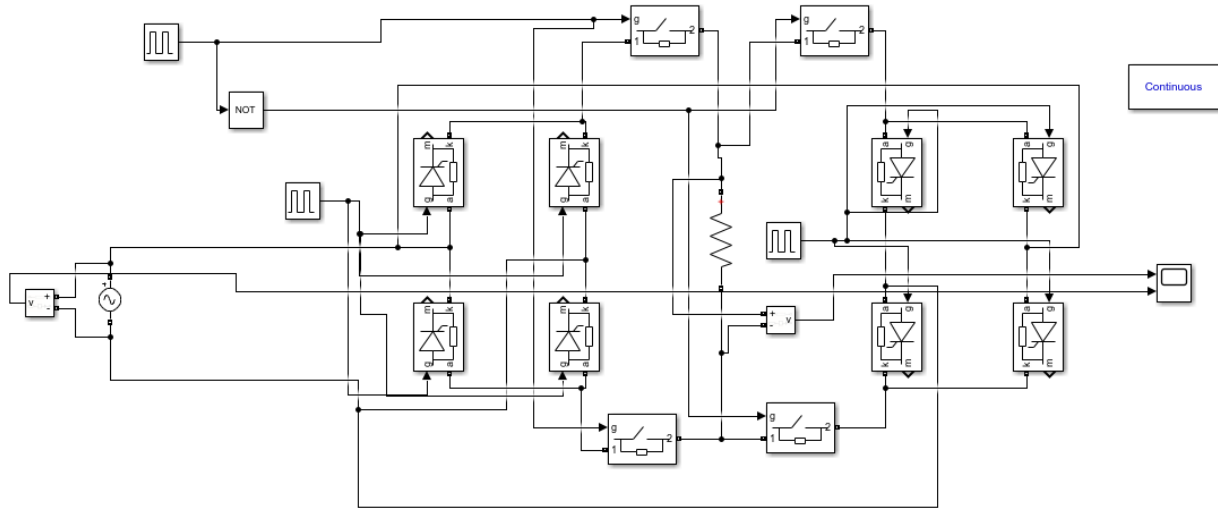


Fig 6.1 : 1 phase cyclo-converter

## Waveforms:

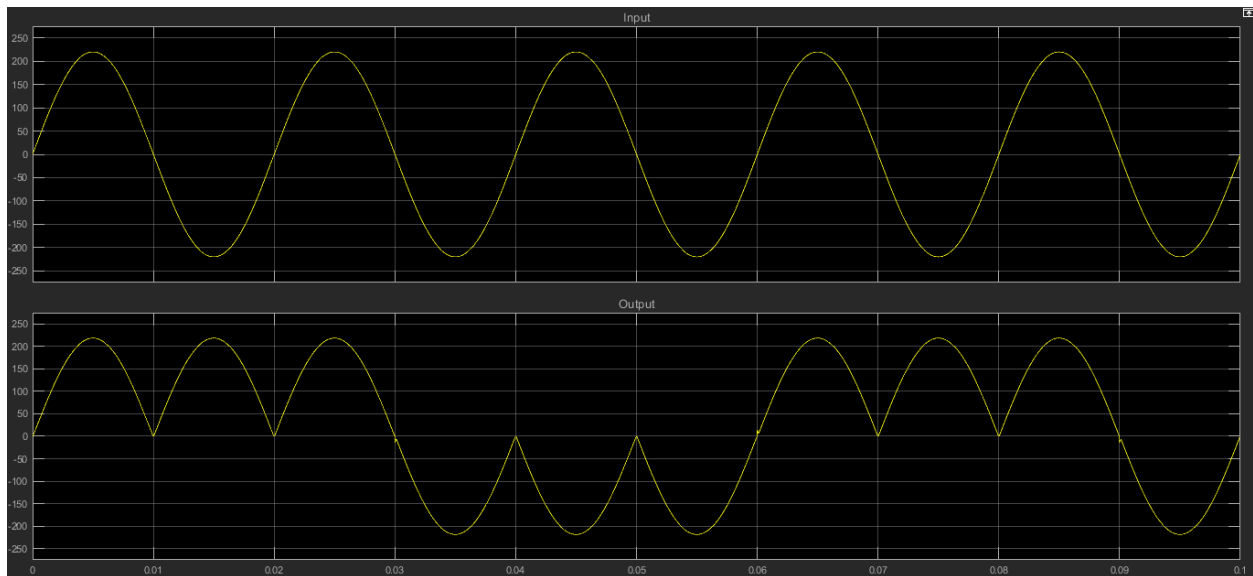


Fig 6.2: 1 phase cyclo-converter (input = 50HZ output = 50/3 Hz ,  $\alpha = 0$ )

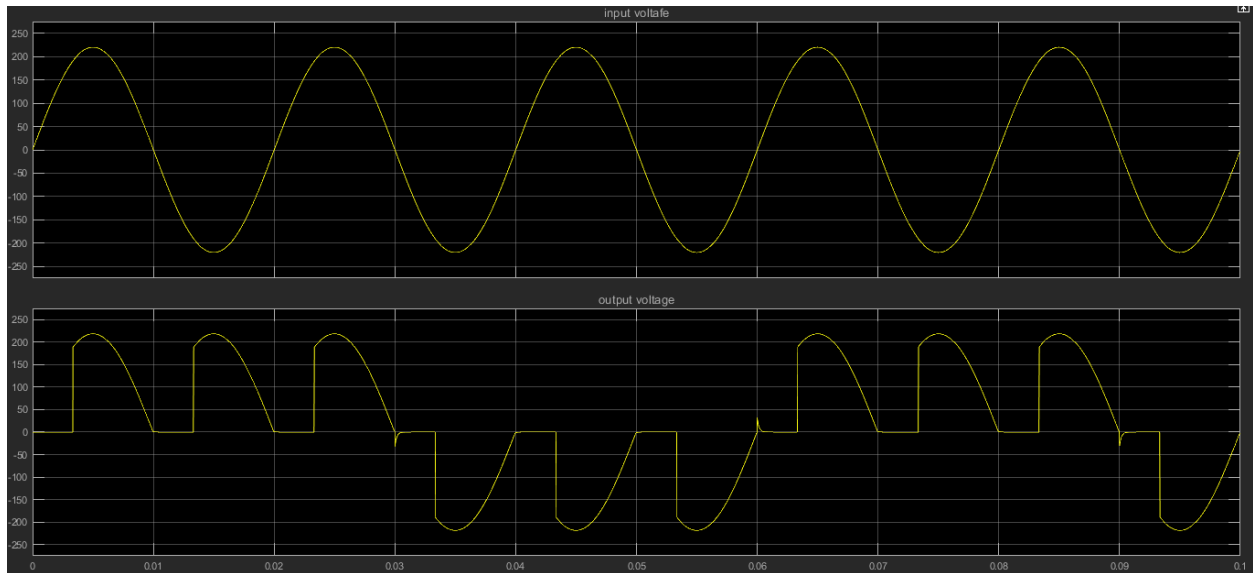


Fig 6.3: 1 phase cyclo-converter (input = 50HZ output = 50/3 Hz ,  $\alpha = 60$ )

### Discussion:

The experiment was about cyclo-converter. The frequency of the output voltage is 1/3 of input voltage. Two rectifier was used to create this cyclo converter – positive full wave rectifier and negative full wave rectifier. When positive rectifier was triggered ,positive cycle output was found and when negative rectifier was negative cycle output was found but two rectifiers were not triggered at a same time. Powergui block was used to supply power to the Simscape ‘Special Technology’ instruments. Desired output was found at the end of experiment. So, the experiment is successful.