Experiment No : 9

Simulation of Single Phase Full Bridge Square Wave Inverter and Three phase inverter with 180° conduction mode

Aim

To simulate

a) single phase full bridge square wave inverter with R ,RL load and and observe input, load voltage and current waveforms

b) three phase inverter with 180° conduction mode and observe input, line and phase voltages

Procedure

a)

1. Set up the circuit to simulate as per the circuit diagram using components
2. Set load parameters to the values given in the design
3. Set DC input voltage V_{dc} = *100 volt*
4. Connect the pulse generator 1 with phase delay as 0 and pulse width as 50% with total frequency of output waveform as 20 kHz and pulse generator 2 with phase delay as 2.5×10^{-5} sec and pulse width 50% with total frequency of output waveform as 20 kHz
5. Set the POWER GUI as continuous
5. Run the simulation and plot different line voltages and phase voltages

Circuit Diagram

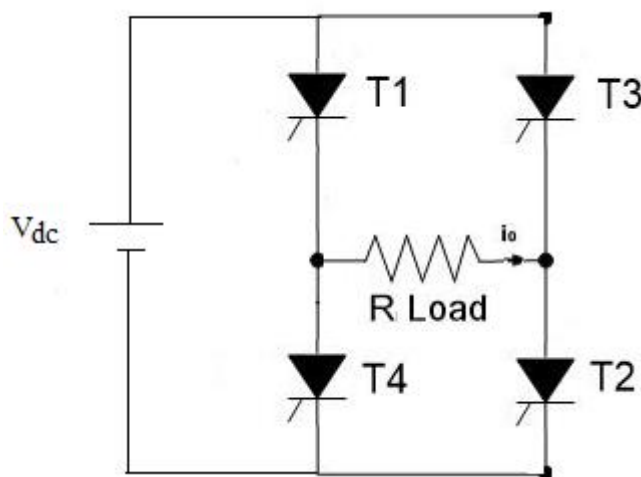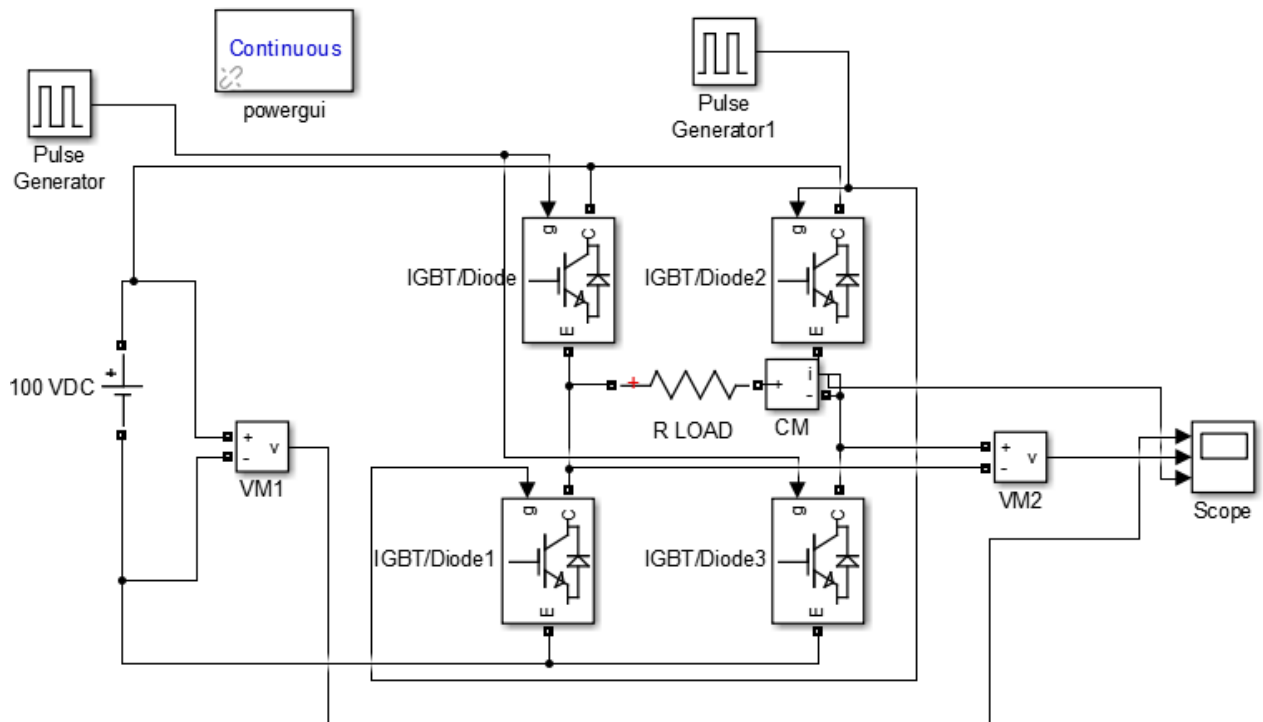**a) 1. Single phase full bridge inverter with R Load**

Fig 16.1 Circuit diagram
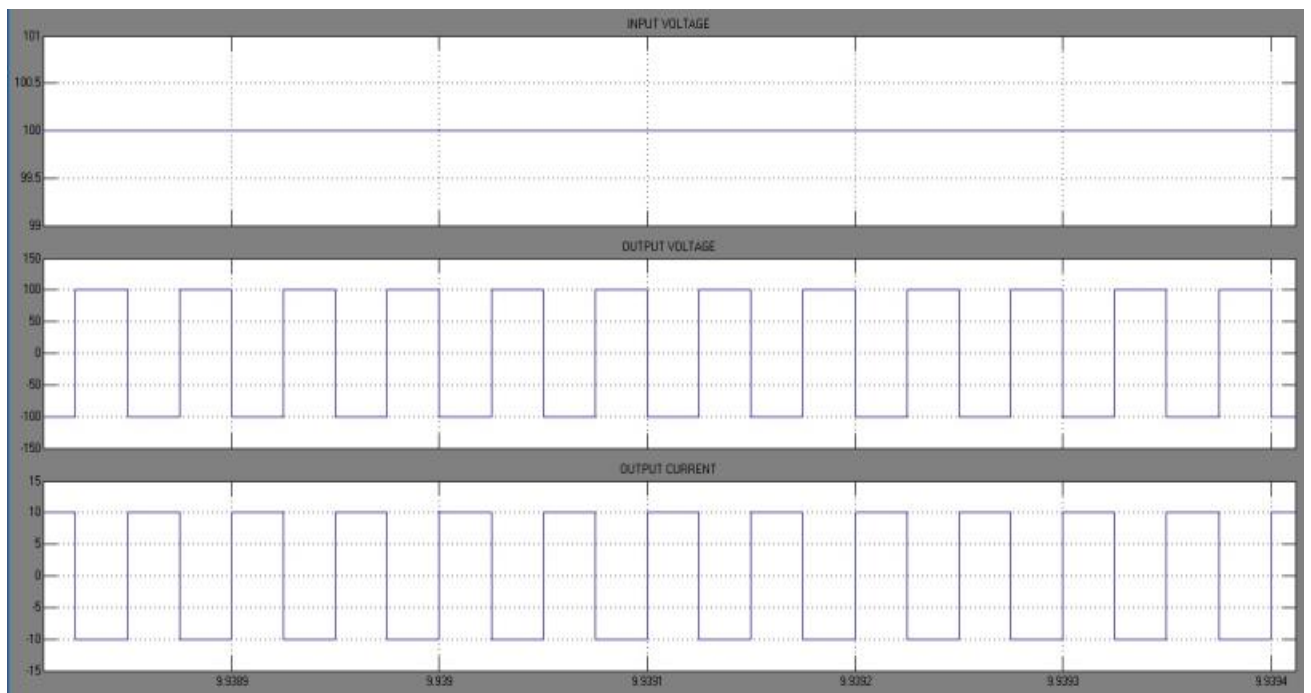

\Fig 16.2 Simulation Diagram

Fig 16.3 Input,Output Volage and current waveforms

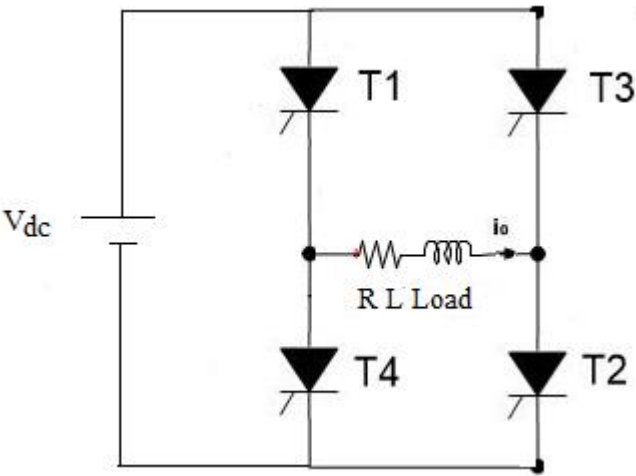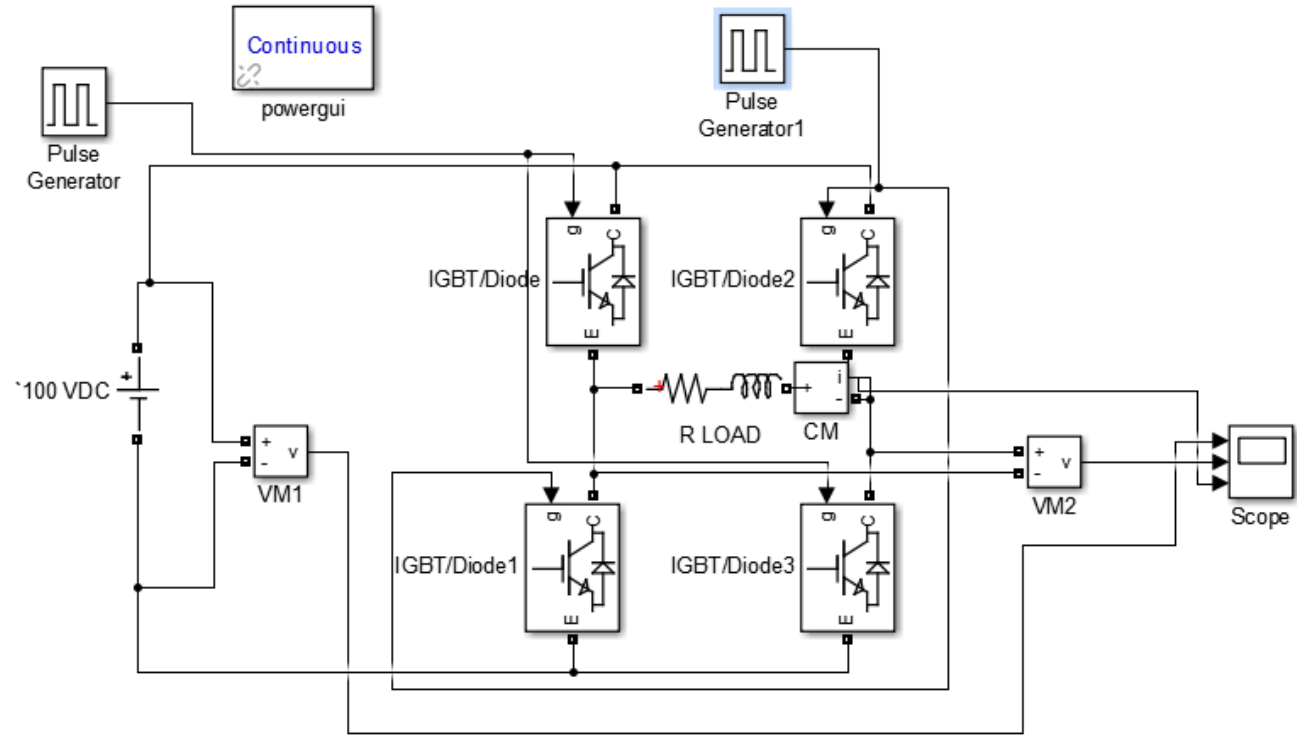## 2.Single phase full bridge inverter with RL Load

Fig 16.4 Circuit diagram
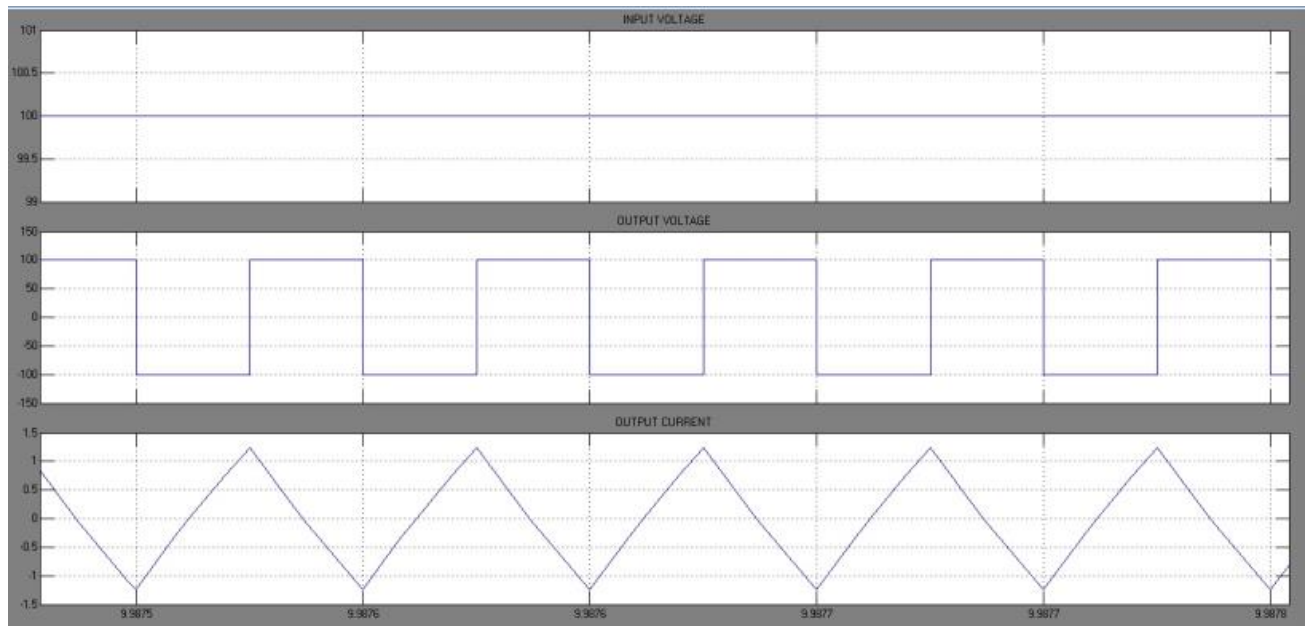

\Fig 16.5 Simulation Diagram

Fig 16.6 Input,Output Volage and current waveforms

Procedure

b)

1. Set up the circuit to simulate as per the circuit diagram using components
2. Connect the pulse generator as the gate pulse of the device
3 .Set the firing angle of different pulse generator
4. Set the POWER GUI as continuous
5. Run the simulation and plot different line voltages and phase voltages
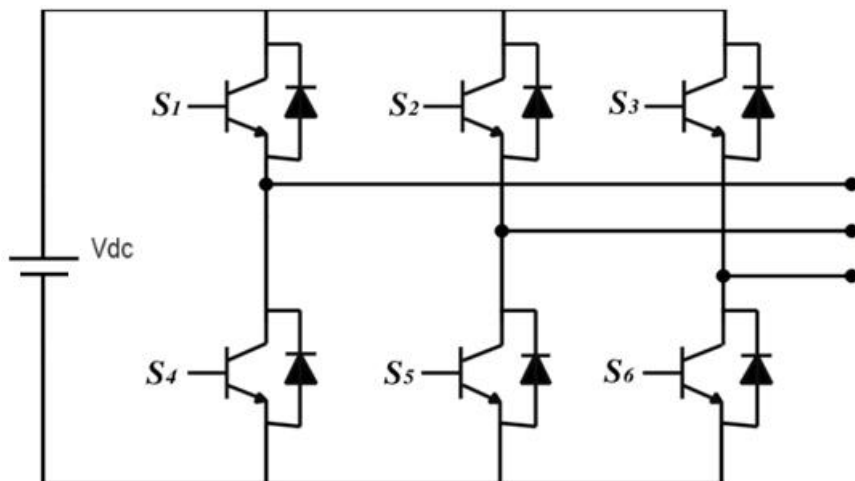
Circuit Diagram
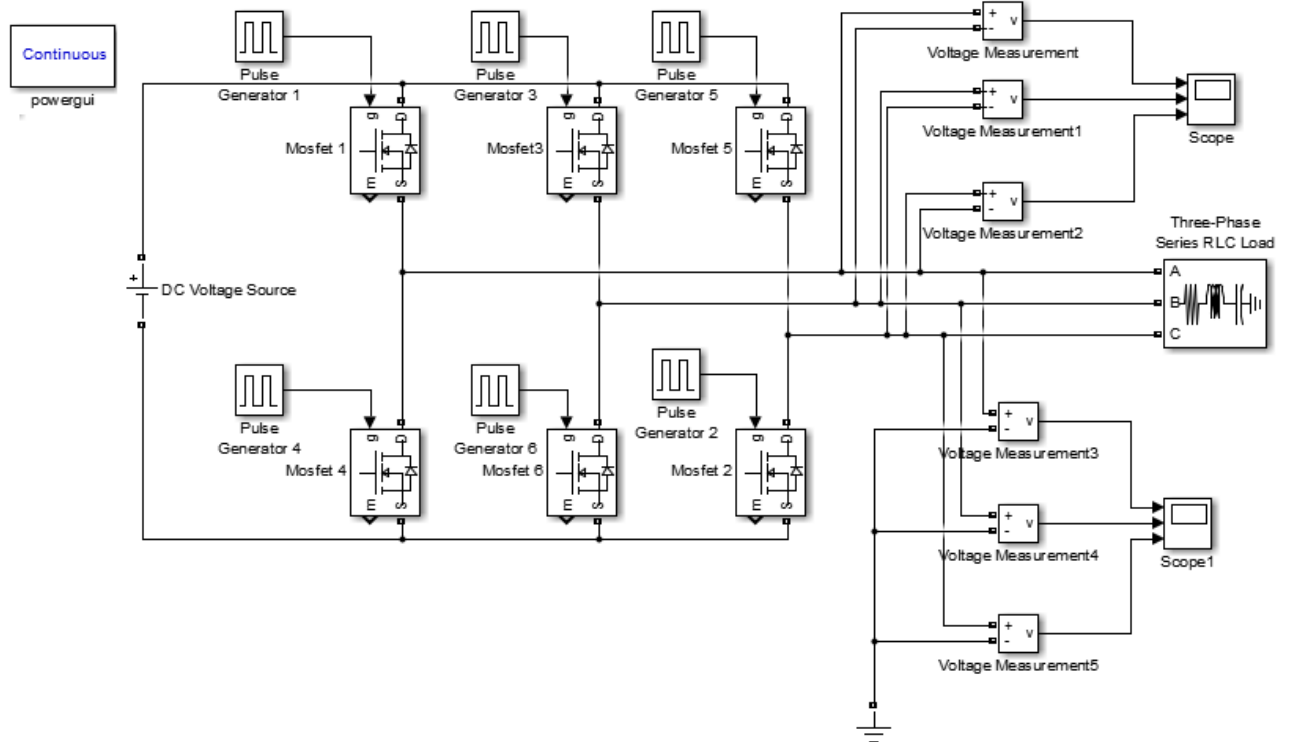

Figure 13.1 Circuit Diagram

Figure 13.2 Simulation Diagram

Input voltage=350V DC
Frequency of output waveform=50Hz
Time period=0.02 Sec
Phase Delay of

$$Pulse\ Generator\ 1 = \frac{0.02}{360} * 0$$

$$Pulse\ Generator\ 3 = \frac{0.02}{360} * 120$$

$$Pulse\ Generator\ 5 = \frac{0.02}{360} * 240$$

$$Pulse\ Generator\ 4 = \frac{0.02}{360} * 180$$

$$Pulse\ Generator\ 6 = \frac{0.02}{360} * 300$$

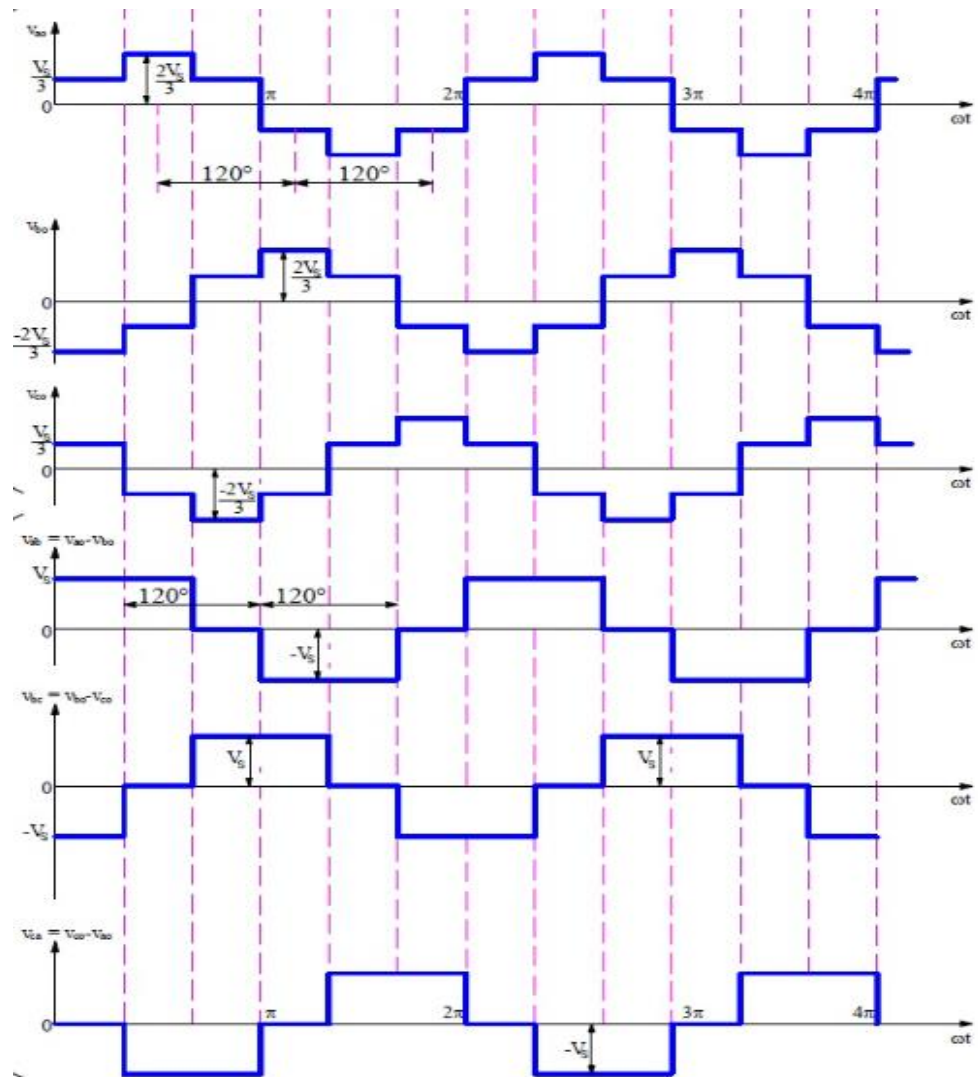$$Pulse\ Generator\ 2 = \frac{0.02}{360} * 420$$

Figure 13.3 Line voltages and phase voltage waveforms of inverter

Result

a)Simulated single phase full bridge square wave inverter with R load and RL load and results are verified

b) Simulated 3 phase inverter in 180° conduction mode and results are verified