Experiment No :6

Simulation of Single Phase fully controlled Rectifier fed Separately Excited DC motor

Aim

To simulate a single phase fully controlled rectifier fed separately excited dc motor using MATLAB and observe the speed, torque, armature current ,armature voltage ,source current waveforms and THD in source current

Procedure

1. Set up the circuit to simulate as per the circuit diagram using components
2. Set motor parameters to the values given in the design
3. Set AC input voltage $V_s = 240\sqrt{2}$ *volt*
4. Connect the pulse generator 1 with phase delay as ***a * 0.02 / 360*** and pulse generator 2 with phase delay as (0.01+(***a * 0.02 / 360***) where a is the firing angle
5. Set the POWER GUI as continuous
5. Run the simulation and plot different line voltages and phase voltages

Circuit Diagram

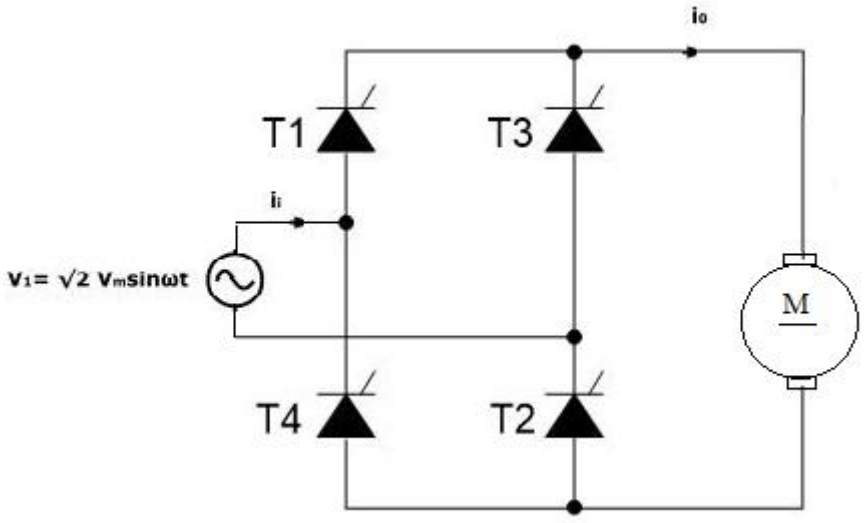

Figure 15.1 Circuit Diagram

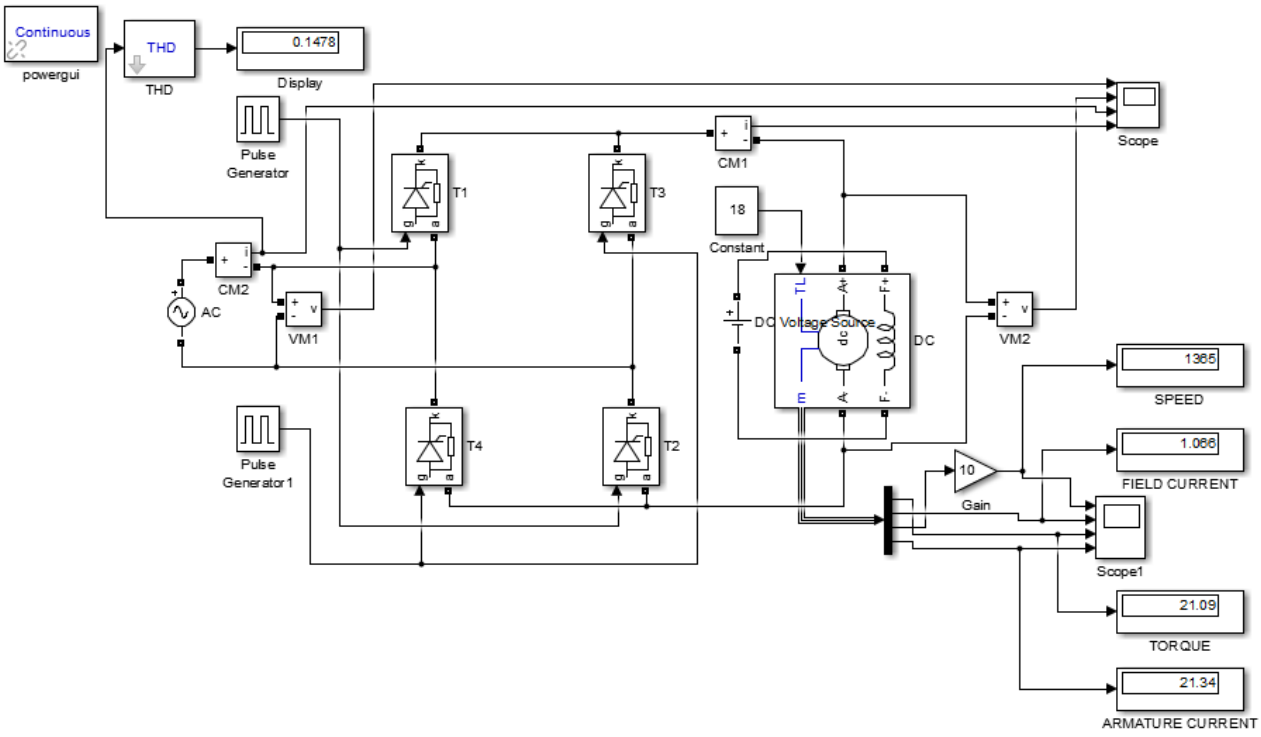

Figure 15.2 Simulation Diagram

5 HP,240V,1750 RPM field:300V DC motor is selected

$V_s = 240\sqrt{2}$ *volt*

Frequency of output waveform=50Hz

Time period=0.02 Sec

Phase Delay of

$Pulse\ \ Generator\ \ 1 = a * 0.02 / 360$

$Pulse\ \ Generator\ \ 2 = 0.01 + (a * 0.02 / 360)$

Whare a is the firing angle

WAVE FORMS

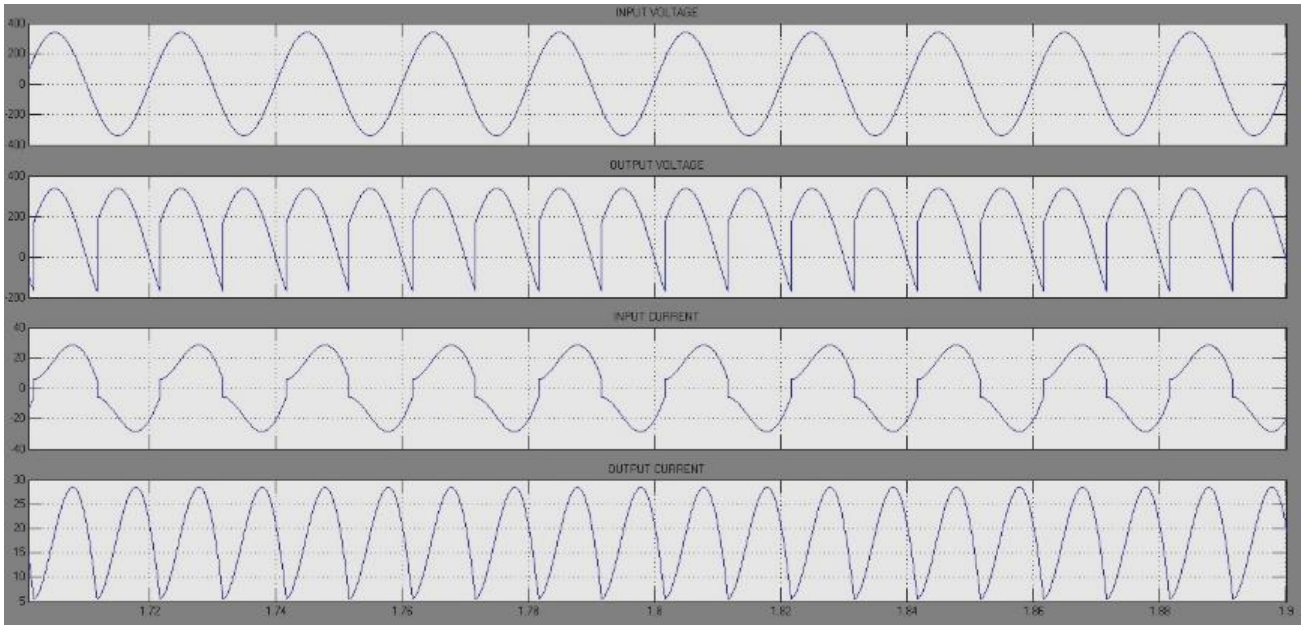

Figure 13.3 Line voltages and phase voltage waveforms of Rectifier

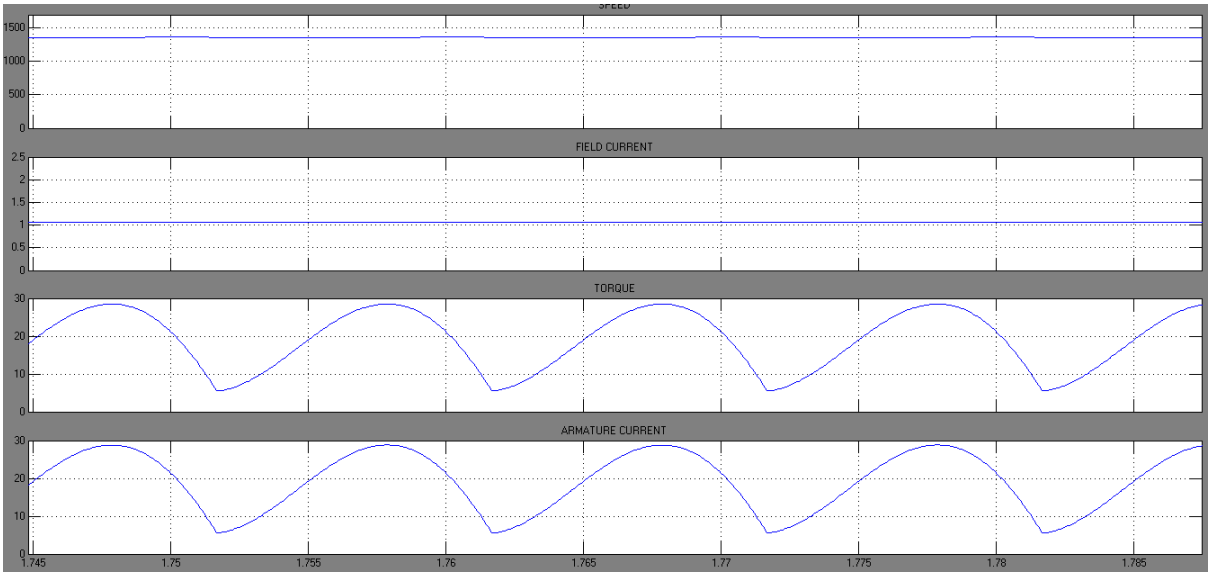

Figure 13.3 speed,Torque,field current and Armature current waveforms of Rectifier

Result

Simulated Single Phase fully controlled Rectifier fed Separately Excited DC motor and the various results are verified