ABSTRACT

A high voltage power supply and electrostatic beam steering was required for the particle accelerator in the university. In market, mostly high voltage power suppliers use same method for generating high voltages. AC to DC convertor, fly back transformer driver circuit and Cockcroft Walton voltage multiplier are commonly used in all high voltage power supplies. The control and monitoring circuits can be different for different suppliers according to their requirements. 30 kV voltages were needed in our case. For this purpose, brief study of the instruction manuals of different high voltage power supplier companies was made. For generating high voltages fly back transformer is used. A driver circuit is made to derive the fly back transformer and for boosting of voltages Cockcroft Walton voltage multiplier is used. Detail analysis is performed for design of fly back transformer. Detail calculations are performed for accurate design of voltage multiplier. Bluetooth voltage controller is made for control the voltages through android mobile phone. By using microcontroller voltages can be easily control and vary to the desired value. Arduino is used in this power supply to control the voltages. Android controlled 30 kV power supply is made according to requirement of particle accelerator. Electrostatic beam steerers are used to deflect the beam of ions in particle accelerators according to desired positions. Steeres consists of two simple metal plates positioned either vertical or horizontal directions according to requirements. Steerer plates are designed according to the design of our accelerator. Sizes of plates are according to the data provided by NEC Pelletron.