AUTOMATIC STAR DELTA STARTER USING RELAYS AND ADJUSTABLE ELECTRONIC TIMER FOR INDUCTION MOTOR

ABSTRACT

The project is designed to provide low voltage start to induction motors. This is achieved by using star to delta conversion. Star/Delta starters are probably the most common reduced voltage starters in the 50Hz industrial motor world. Star delta is used in an attempt to reduce the start current applied to the motor. Thereafter, full load current is applied to the motor. The Star/Delta starter is generally manufactured from three contactors; and electromechanical timer and a thermal overload for operating a 3 phase motor at 440 volt at ac mains supply 50 Hz. The interlocking arrangement of all the contactor coils is traditionally wired in 440 volt AC.

This project uses a system to start a 3 phase motor at 440 volt AC mains supply 50 Hz with a set of 12 volt DC relays in star mode first and then to delta mode by an electronically adjustable timer. A set of relays are used to shift the motor connections from star to delta with a time delay. The project is supplied with six lamps instead of a 3 phase motor i.e., two lamps representing each phase winding of the motor. The interlocking arrangement of the relay coils and the electronic timer are all wired in low voltage DC of 12 volt fed from an inbuilt DC power supply for safe handling of the starter during the study. It still retains its application for a 3 phase motor starting with single phasing prevention also. During star operation the lamps would glow dim indicating the supply voltage across the coils are 440/root of (3). In delta condition after the timer operates the lamps would glow with full intensity indicating full supply voltage of 440volts. The timer comprises of a 555 in mono-stable mode the output of which is fed to a relay for changing the mains supply from 3 phase star to delta. The project also has the provision of
single phasing protection since 3 phase motors get burnt if any one phase goes missing during running. The output to the lamps shall be completely cut-off in the event of any phase failure.

Further the project can be enhanced by using a thyristors in firing angle control principle for soft start of the induction motor that would overcome all the drawbacks of star delta starter.

**BLOCK DIAGRAM**