

Star Delta Controlling Of Motor Using PLC

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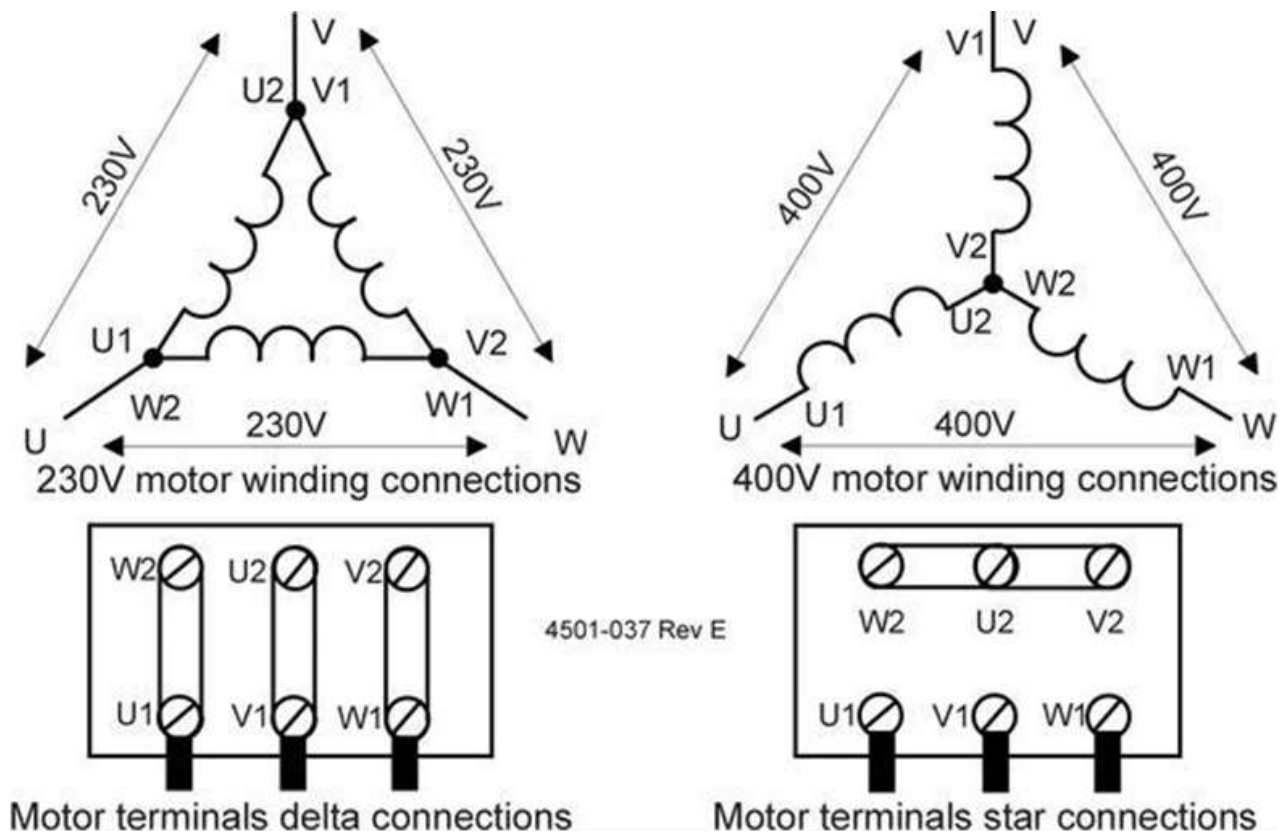
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Abstract: The main aim of this paper is to study and learn how to connect the three phase Motor star/delta. IN this paper the basis concept of programmable logic controller (plc) are discussed. the three phase Motor is conversion to the delta connection by programmable logic controller (plc) ,after converted to the delta connection of three phase Motor continues with the same speed and power. The Star/Delta Starter is generally obtained from three contactors, pneumatic timer, and a thermal overload relay or circuit breaker, for 3 phase motor at 440 motor AC main supply 50 Hz

Keywords: Star Delta starter, 3 phase induction motor, PLC

I. INTRODUCTION

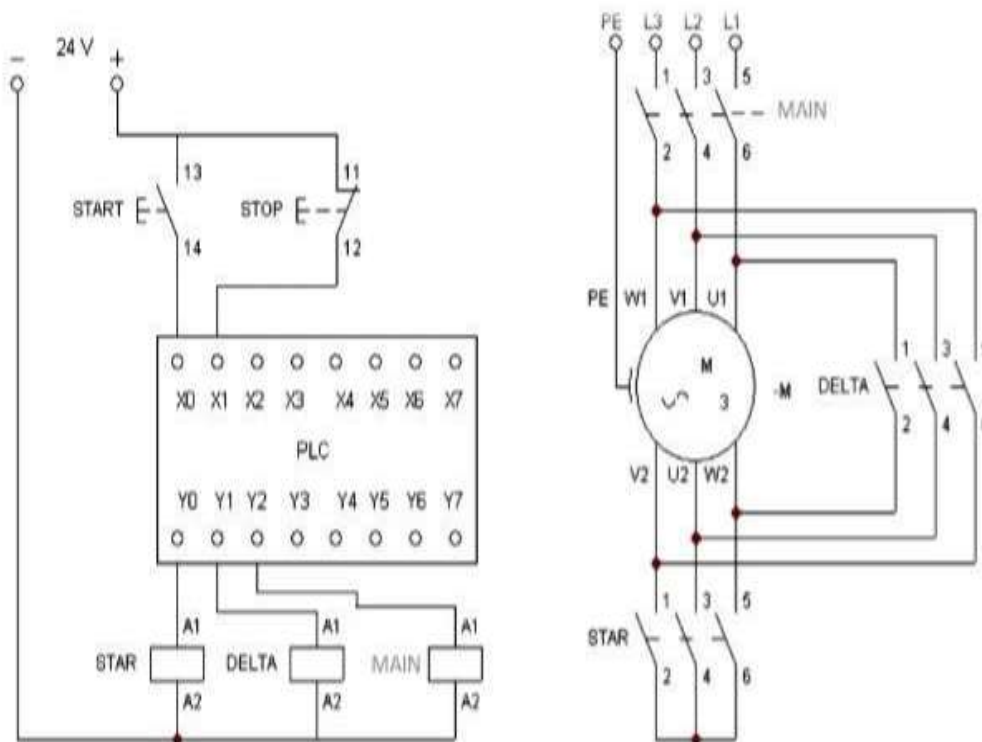
A star delta starter is the most commonly used method for the starting of a 3 phase induction motor .in stat delta starting an induction motor is connected in through a star connection throughout the starting period. then once the motor reaches the required speed the motor is connected in through a delta connection monitoring and inspection of several process is becoming dominant part of the automation technique in any industry. so the automation is basically the delegation of human Control function to technical equipment for increasing productivity and quality, reducing costs , increasing safety in working condition.



Star delta starter

This is a starting method that reduces the starting current and starting torque. Star delta starter design normally consists of three contactors, an overload relay or circuit breaker and a timer for setting the time in the star-position.

Controlling of star delta using plc



- 1) During the working of the starter, two contactors remain closed. These two contactors are the main contactor and delta contactor.
- 2) The third contactor is star contactor and it's taking part only during the starting time of motor and carries star current when the motor in star state.
- 3) The current in star state is 1/3 of the current in delta state. Hence contactor rating is one-third of motor rated current.
- 4) During starting the Main contactor KM3 and Star contactor KM1 are closed initially.
- 5) After some time, the timer in the circuit gets activated, it opens star contactor and closed delta contactor.
- 6) The switching of star state to delta state is done by using a timer, which connected in the wye-delta starter control circuit.

Programmable logic controller (PLC)

A PROGRAMMABLE LOGIC CONTROLLER (PLC) is an industrial computer control system that continuously monitors the state of input devices and makes decisions based upon a custom program to control the state of output devices.

A PLC' s functions are divided into three main categories: inputs, outputs and the PLC

DIFFERENT FIELD OF AREAS WHERE PLC IS USED

The plc is being used in many automation processes and several areas of industries. Some of the application areas are discussed below:

Motion and Direction control

This application of PLC can be seen in our daily life such as in elevators, swings in amusement parks, in robots. Elevators are utilized by people to reach the different floor levels so it can be operated by plc for both the directions. Similarly swings can be rotated in clockwise and anticlockwise motion without need of manual labour.

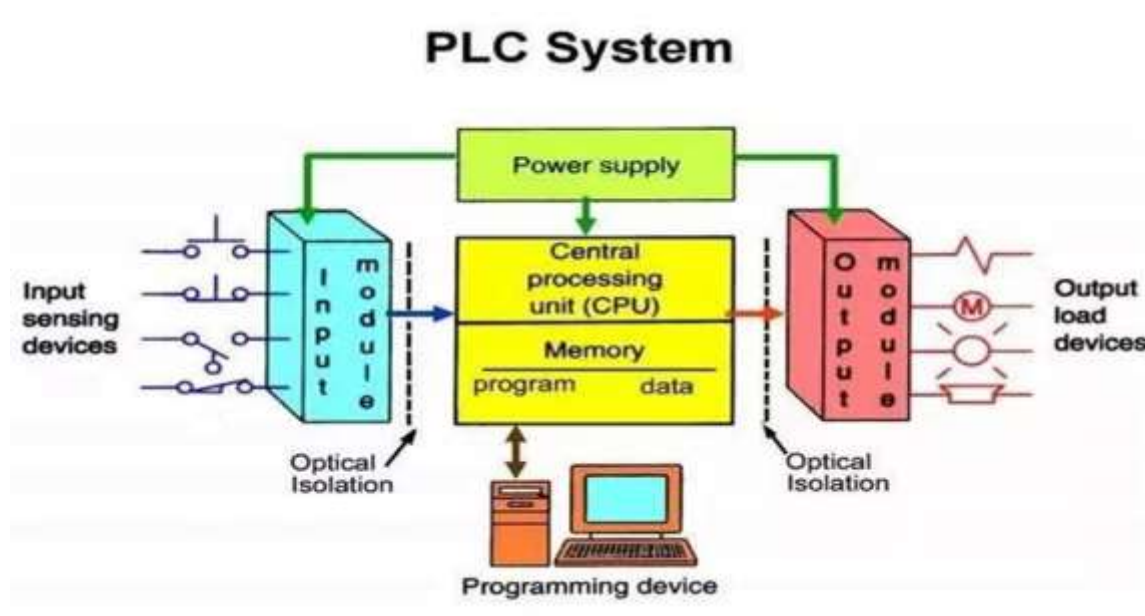
PLC used as a Switch

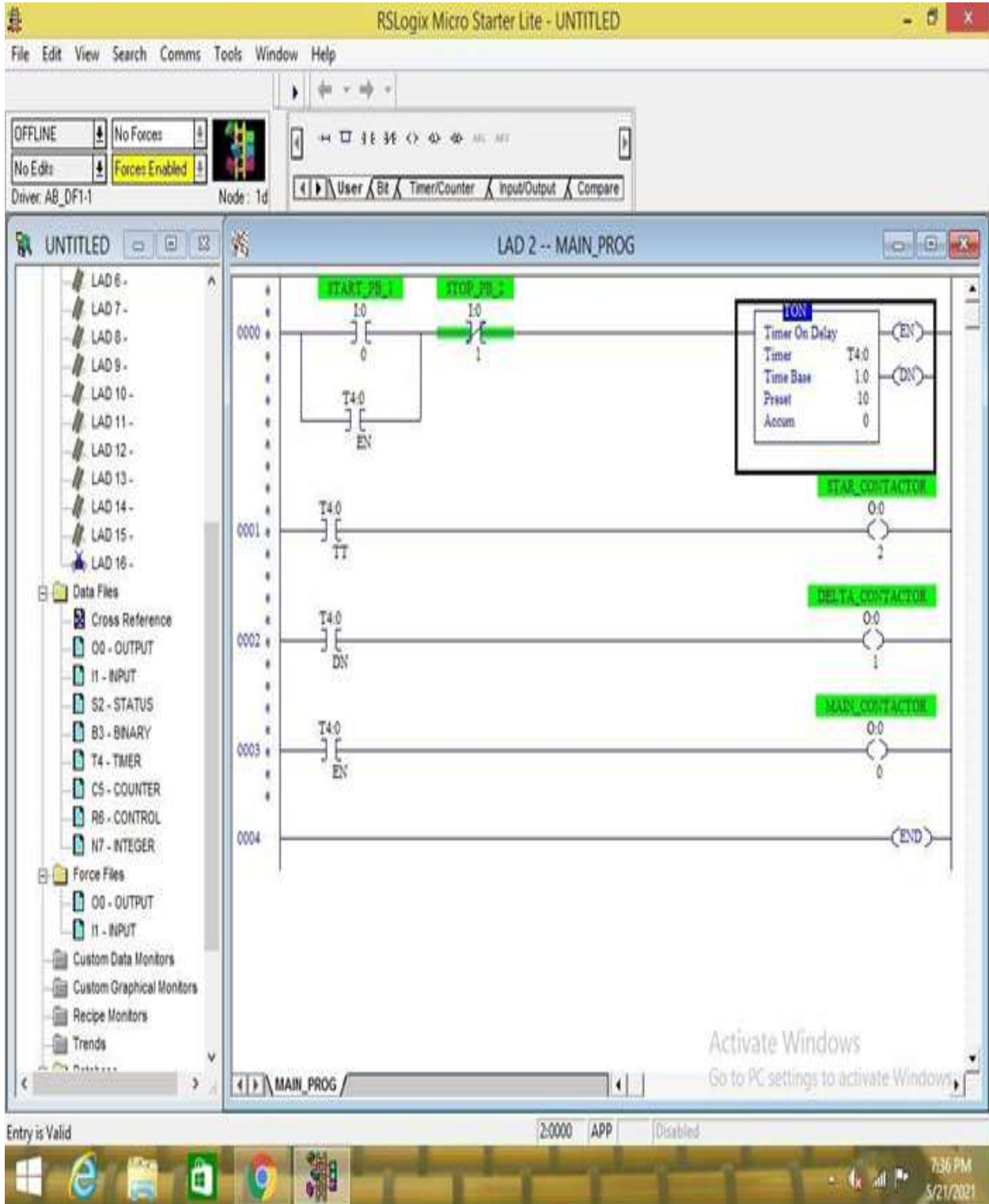
The switching operation is obtained by controlling the contactor through ladder diagram. The on/off operation should be automatic and its requirement is seen in the controlling of machines involved with moldings, grinding and injection. Also seen in

frequent door opening and closing requirements.

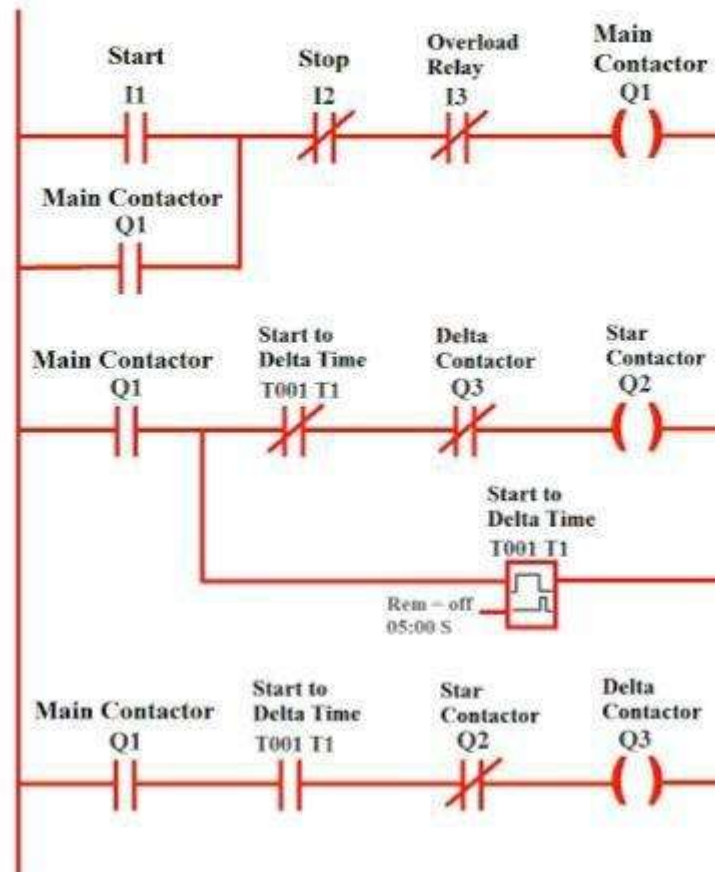
PLCs Used in Official Works

PLCs are being used in Data computation works as because it can perform all sorts of calculations such as arithmetic, logical, Matrix. Star Delta starting is suitable for medium and high hp motors. It is found in applications of the lifting, pumping, ventilation and electrical traction type, or in centrifuges. They are used in industry, e.g. in iron and steel plants, in marine applications, water and water treatment, and port infrastructure, in mines and quarries, and paper mills.





STAR-DELTA MOTOR STARTER LADDER LOGIC



CONCLUSION

Hence the set up was implemented for the PLC based star delta starter for starting and direction control of three phase induction motor. The time of forward rotation and backward rotation is controlled using timers in the ladder diagram program. It is found that a great flexibility is available in PL programming as any sort of changes can be done through only changing the prescribed commands in the ladder diagram. Thus PLC has proved to be universal controller and utilized for the growth of the automation technology.

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