



Three Phase Slip Ring Motor Wound Rotor Starter

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ABSTRACT

Three-phase slip-ring (wound rotor) induction motors are widely used in heavy load and torque applications. While, three-phase induction motors can be challenging to start, especially when they are driving heavy loads. During startup, the rotor experiences a large inrush current, which can lead to overheating and mechanical stress. To mitigate these issues, various starting methods are employed, and one such method is the slip-ring rotor starter. In the following wiring guide, we will show how to control the starting and speed control of the three-phase wound rotor (slip-ring) induction motor with the help of schematic, power and control wiring diagrams

INTRODUCTION

Three-phase slip-ring (aka wound rotor) induction motors are widely used in heavy load and torque applications. While, three-phase induction motors can be challenging to start, especially when they are driving heavy loads. During startup, the rotor experiences a large inrush current, which can lead to overheating and mechanical stress. To mitigate these issues, various starting methods are employed, and one such method is the slip-ring rotor starter. In the following wiring guide, we will show how to control the starting and speed control of the three-phase wound rotor (slip-ring) induction motor with the help of schematic, power and control wiring diagrams.

LITERATURE REVIEW

Sectionalizing

If it is necessary to start a three phase induction motor on load, then a wound rotor machine will normally be selected. Such a machine allows an external resistance to be connected to the rotor of the machine through slip rings and brushes

Thumping

A wound-rotor motor can be used in several forms of adjustable-speed drive. Common applications include hoists and conveyor systems. Certain types of variable-speed drives recover slip-frequency power from the rotor circuit and feed it back to the supply, allowing wide speed range with high energy efficiency.

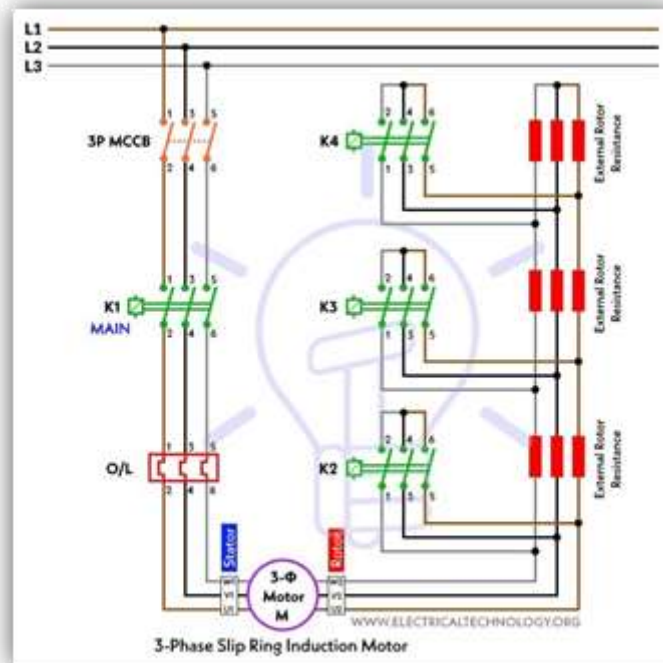
Star-delta starting method of induction motor

In the star-delta starting method of induction motor, a two-way switch is used to connect the stator winding in star while starting and in delta while running at normal speed. Star-Delta starter in a three-phase induction motor is used mainly to reduce the starting current.

This is the most common form of starter used for three phase induction motors. It achieves an effective reduction of starting current by initially connecting the stator windings in star configuration which effectively places any two phases in series across the supply. Starting in star not only has the effect of reducing the motors start current but also the starting torque.

Once up to a particular running speed a double throw switch changes the winding arrangements from star to delta whereupon full running torque is achieved. Such an arrangement means that the ends of all stator windings must be brought to terminations outside the casing of the motor.

Circuit Diagram



CONCLUSION: -

This project is intended to in the slip ring induction motor the external resistance for speed control is connected during starting condition and if rotor resistance high, starting torque is also high and the rotor current is low. Furthermore, the slip necessary to create maximum torque is directly proportional to the rotor resistance.

FUTURE SCOPE

Soft Starter Market Analysis

The global soft starter market was valued at USD 1726.39 million in 2020, and it is expected to reach a value of USD 2386.47 million by 2026, while registering a CAGR of approximately

5.91% over the forecast period, 2021 - 2026.

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