



SNS COLLEGE OF TECHNOLOGY

(An Autonomous Institution)



COIMBATORE-35

**Accredited by NBA-AICTE and Accredited by NAAC – UGC with A+ Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai**

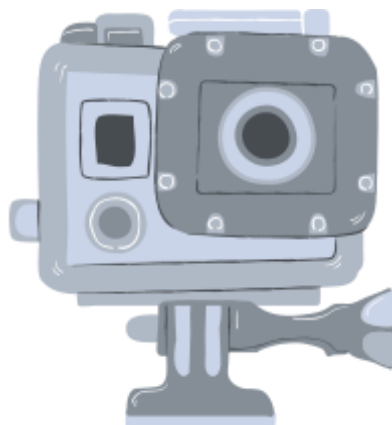
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

**COURSE NAME: 19EET207/ SYNCHRONOUS AND INDUCTION
MACHINES**

II YEAR / IV SEMESTER

Unit 4 – CONCEPT OF STARTING, BRAKING AND SINGLE PHASE INDUCTION

MOTOR



Topic 2: Remote operated DOL starter



GUESS THE TOPIC NAME...





INDUCTION MOTORS-Starter

Type of Motor Starters:

Following are the starting methods of motor starting

1. Direct Online Starter (DOL)
2. Stator Resistance starter
3. Rotor Resistance or Slip Ring Motor Starter
4. Autotransformer Starter
5. Star Delta Starter
6. Soft Starter
7. Variable frequency drive (VFD)

The motor starters have many types but mainly they are classified into two types.



INDUCTION MOTORS-Starters



- **Manual Starter**

This type of starter operates manually and does not require any experience. A push-button is used to turn OFF & ON the motor connected with it. The mechanism behind the button includes a mechanical switch that breaks or makes the circuit to stop or start the motor.

They also provide overload protection. However, these starters do not have LVP (low voltage protection) i.e. it does not break the circuit upon power failure. It can be dangerous for some applications because the motor restarts when the power is restored. Thus they are used for a low power motor. Direct On-Line (DOL) starter is a manual starter that provides overload protection



Starters

Magnetic Starter

- Magnetic starters are the most common type of starter & they are mostly used for high power AC motors. These starters operate electromagnetically like a relay that breaks or makes the contacts using magnetism.
- It provides a lower & safer voltage for starting & also includes protection against low voltage & overcurrent. During the power failure, the magnetic starter automatically breaks the circuit. Unlike manual starters, it includes automatic & remote operation that excludes the operator.
- The magnetic starter consists of two circuits;

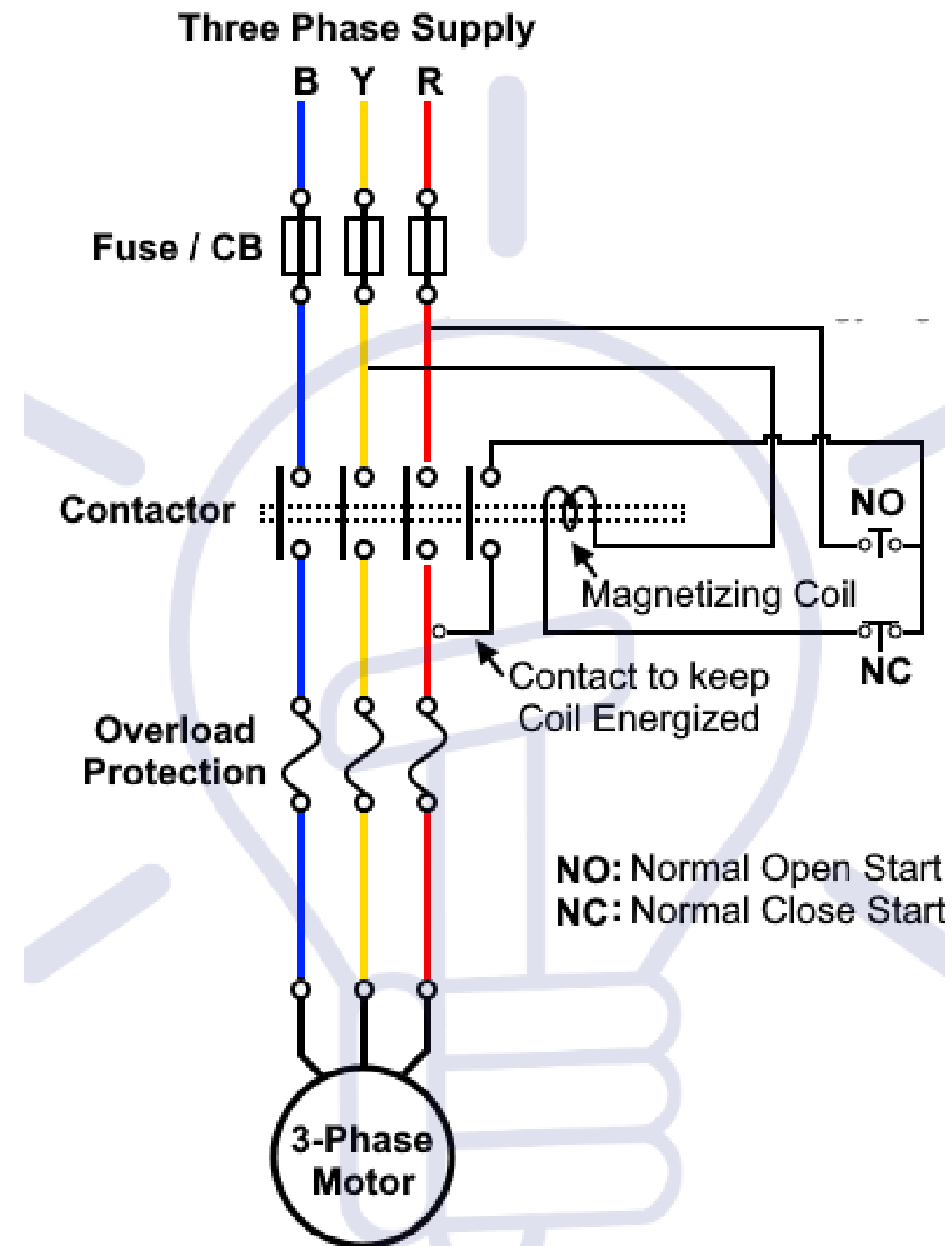
Power circuit; this circuit is responsible for supplying power to the motor. It consists of electrical contacts that turn ON/OFF the power supplied from the supply line to the motor through overload relay.

Control circuit; this circuit controls the contacts of the power circuit to either make or break the power supply to the motor. The electromagnetic coil energizes or de-energizes to pull or push the electrical contacts. Thus providing a remote control for the magnetic starter.



Direct Online (DOL) Starter

- DOL Direct Online Starter is the simplest form of motor starter that connects the motor directly to the power supply.
- It consists of a magnetic contactor that connects the motor with a supply line & an overload relay for protection against overcurrent.
- There is no voltage reduction for safe starting a motor. Therefore the motor used with such starters has below 5 hp rating. It has two simple push buttons that start & stop the motor.





Direct Online (DOL) Starter

- Pressing the start button energizes the coil that pulls the contactors together to close the circuit. And pressing the stop button de-energizes the contactor's coil & pushes its contacts apart thus breaking the circuit. The switch used for turning ON/OFF the power supply can be of any type such as rotary, level, float, etc.
- Although, this starter does not provide safe starting voltage the overload relay provides protection against overheating & overcurrent. The overload relay has normally closed contacts that energize the contactor's coil. When the relay trips, the contactor's coil de-energize and break the circuit.





Direct Online (DOL) Starter



Advantages of DOL Motor Starter

- it has a very simple & cost-effective design.
- It is very easy to understand & operate.
- it provides high starting torque due to the high starting current.

Disadvantages of DOL Motor Starter

- The high inrush current can damage the windings
- The high inrush current causes voltage dip in the power line.
- It is not suitable for heavy motors
- It can decrease the lifespan of a motor





SUMMARY

Direct Online (DOL) Starter



KEEP
LEARNING..
Thank u

SEE YOU IN NEXT CLASS