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: 23EET204 -Electrical Machines II

II YEAR / IV SEMESTER

Unit 4 –STARTING AND SPEED CONTROL OF THREE PHASE INDUCTION MOTOR

Topic 1: Types of Starters

GUESS THE TOPIC NAME…

INDUCTION MOTORS-Need for Starter

- High inrush current during startup (6–8 times full-load current)
- Protect motor windings from damage
- Gradual increase of speed and torque
- Prevent voltage dip in power supply

Types of Starters

1. Direct-On-Line (DOL) Starter
2. Star-Delta Starter
3. Auto-Transformer Starter
4. Soft Starter
5. VFD (Variable Frequency Drive)

DOL Starter

Working Principle:

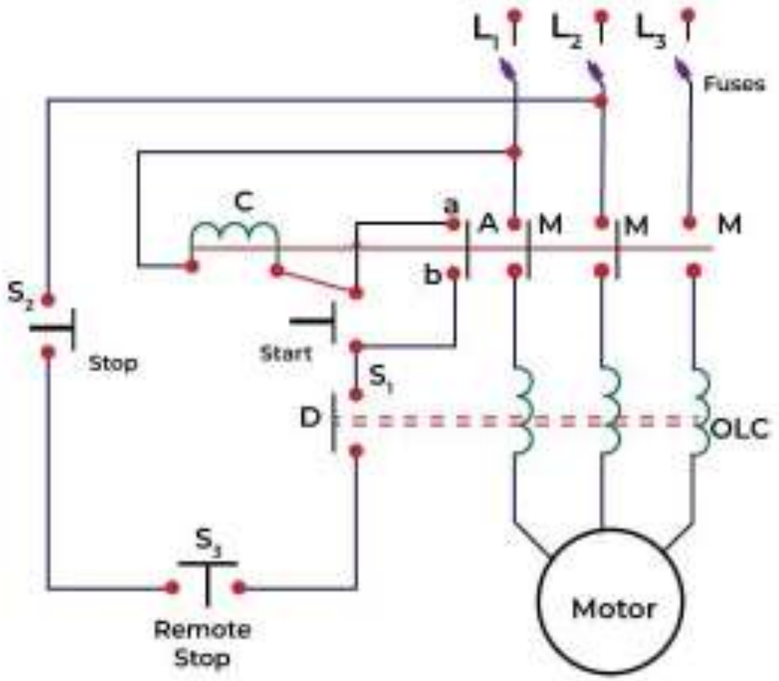
Connects motor directly to full line voltage

Uses a contactor and overload relay

Pros: Simple, cost-effective

Cons: High inrush current

Application: Small motors (<5 HP)



Star-Delta Starter

Working Principle:

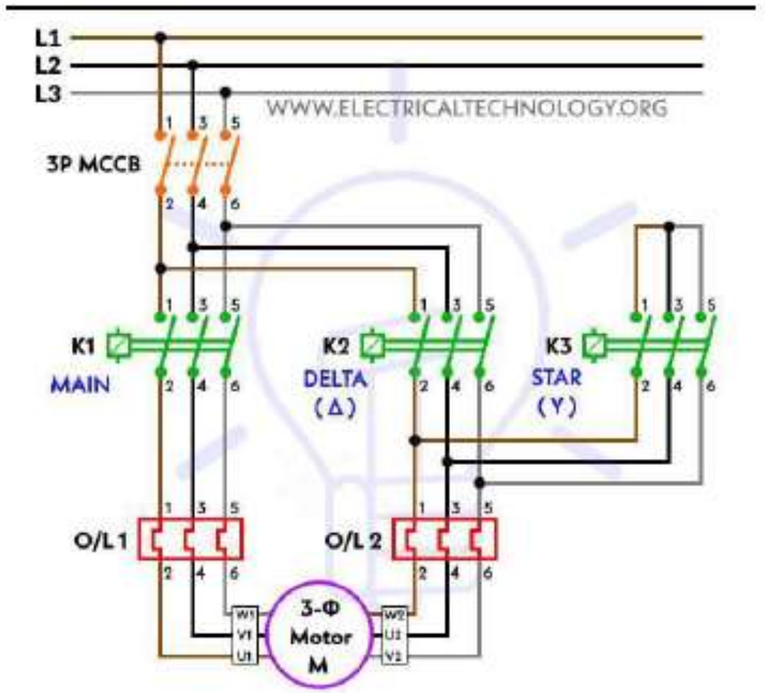
Motor starts in star connection, then shifts to delta

Reduces starting current to 1/3

Pros: Reduced current and torque during start

Cons: Sudden transition can cause torque dip

Application: Motors above 5 HP



Auto-Transformer Starter

Working Principle:

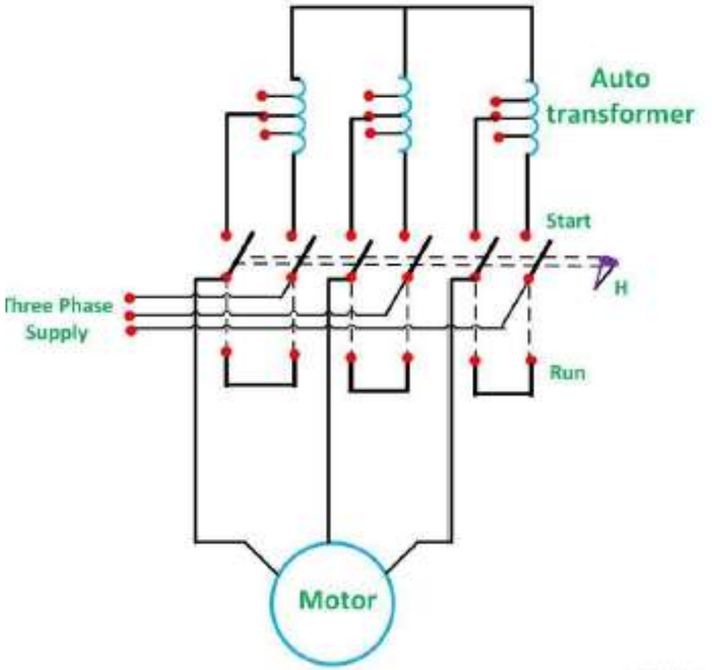
Uses transformer taps to reduce voltage at startup

After startup, full voltage is applied

Pros: Smooth starting, better torque control

Cons: Bulkier and costlier

Application: Large motors requiring torque control



Soft Starter

Working Principle:

Uses thyristors to gradually increase voltage

Smooth acceleration and deceleration

Pros: Reduces mechanical stress, adjustable settings

Cons: Limited speed control

Application: Pumps, conveyors

variable Frequency Drive (VFD)

Working Principle:

Controls frequency and voltage to motor

Provides full-speed control

Pros: Energy savings, full control of torque/speed

Cons: Expensive, complex

Application: HVAC, elevators, CNC machines

KEEP
LEARNING..

Thank u

SEE YOU IN NEXT CLASS