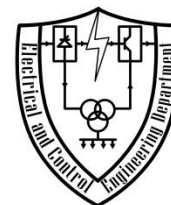




College of Engineering and Technology
Electrical and Control Engineering Department



Automated Industrial Systems I

EE512

EX3: Forward/Reverse Motor Operation

Lecturer name:

Student name :

Registration # :

Experiment 3

Forward/Reverse Motor Operation

1- Objective

To change the direction of a three phase induction motor rotation.

2- Theory

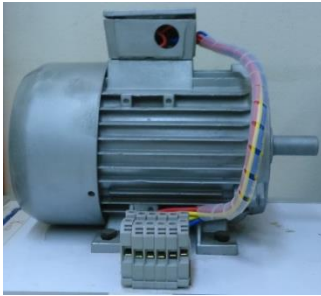
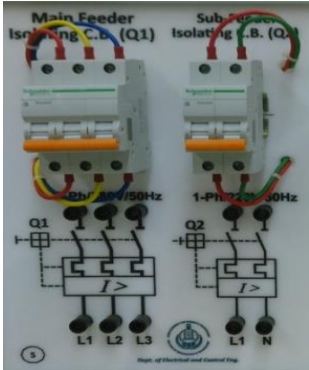
To change the direction a three phase induction machine rotation, two of its phases needs to be exchanged, thus changing the phase sequence from, say ABC to CBA.

This can be accomplished by using two contactors, one for the forward or CW rotation and one for the reverse or CCW rotation.

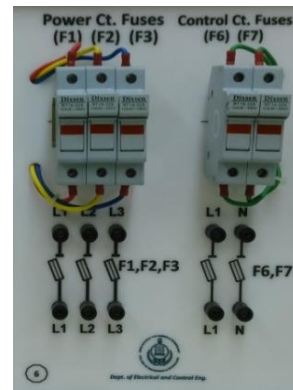
The forward and reverse contactors are mechanically interlocked i.e., if one of them is closed the other cannot close. This is done to avoid dead short circuit in case both the contactors closing simultaneously.

Also electrical interlocking could be provided using the contactors control contacts.

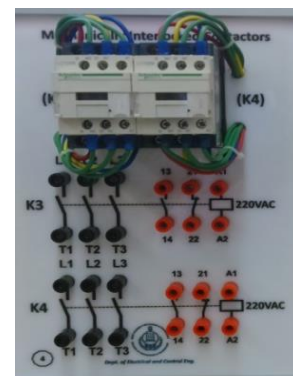
3- Instruments & Equipments

| | |
|---|--|
| Three phase induction motor |  |
| Main and Sub feeder isolating circuit breakers (board #5) |  |

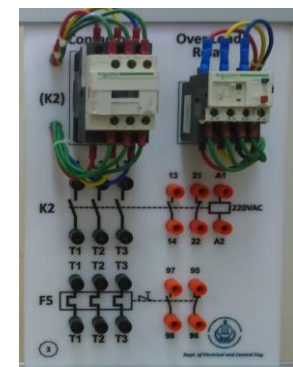
Power and control circuits fuses
(board #6)



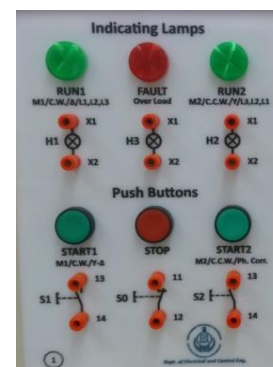
Three phase mechanically interlocked
contactors
(board #4)



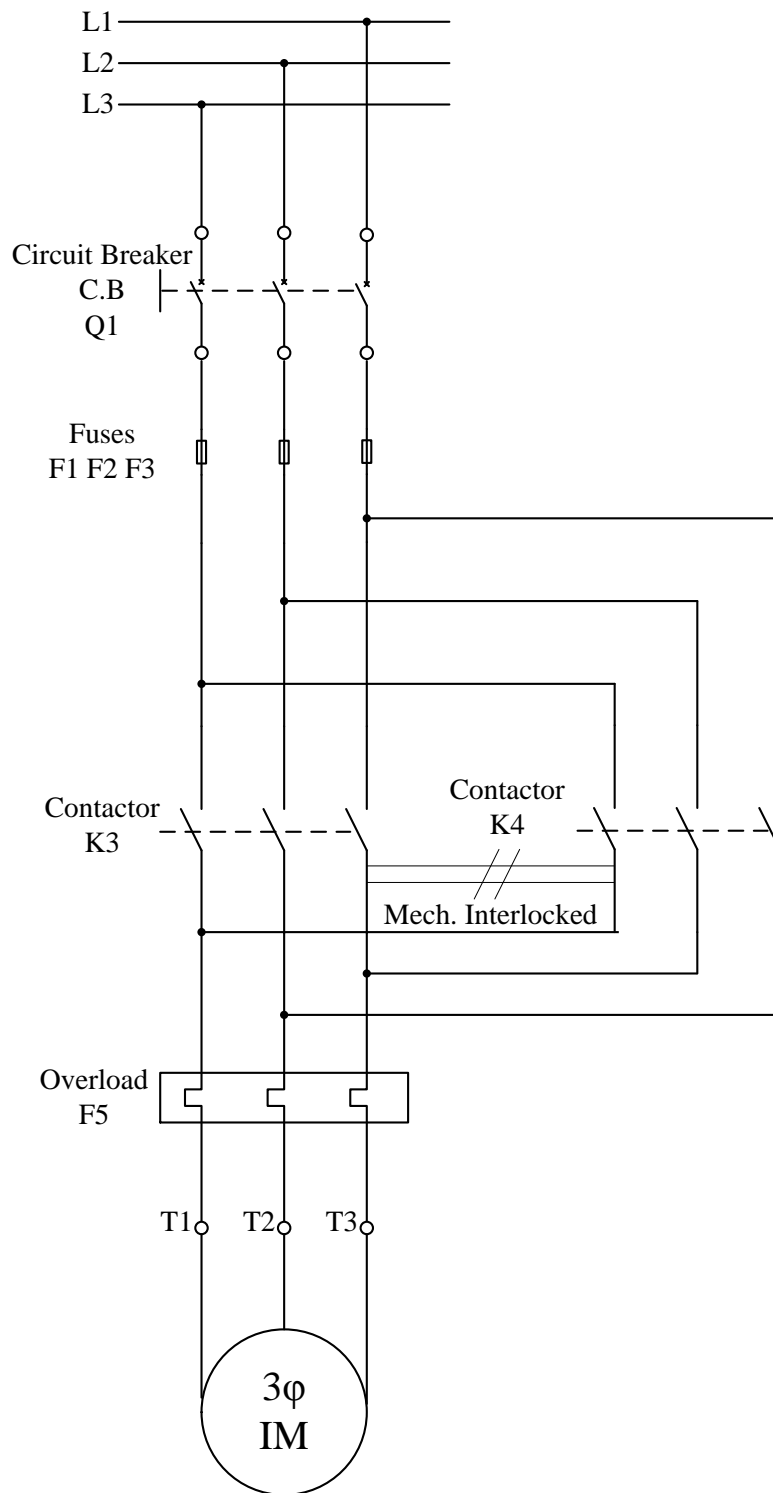
Overload
(board #3)



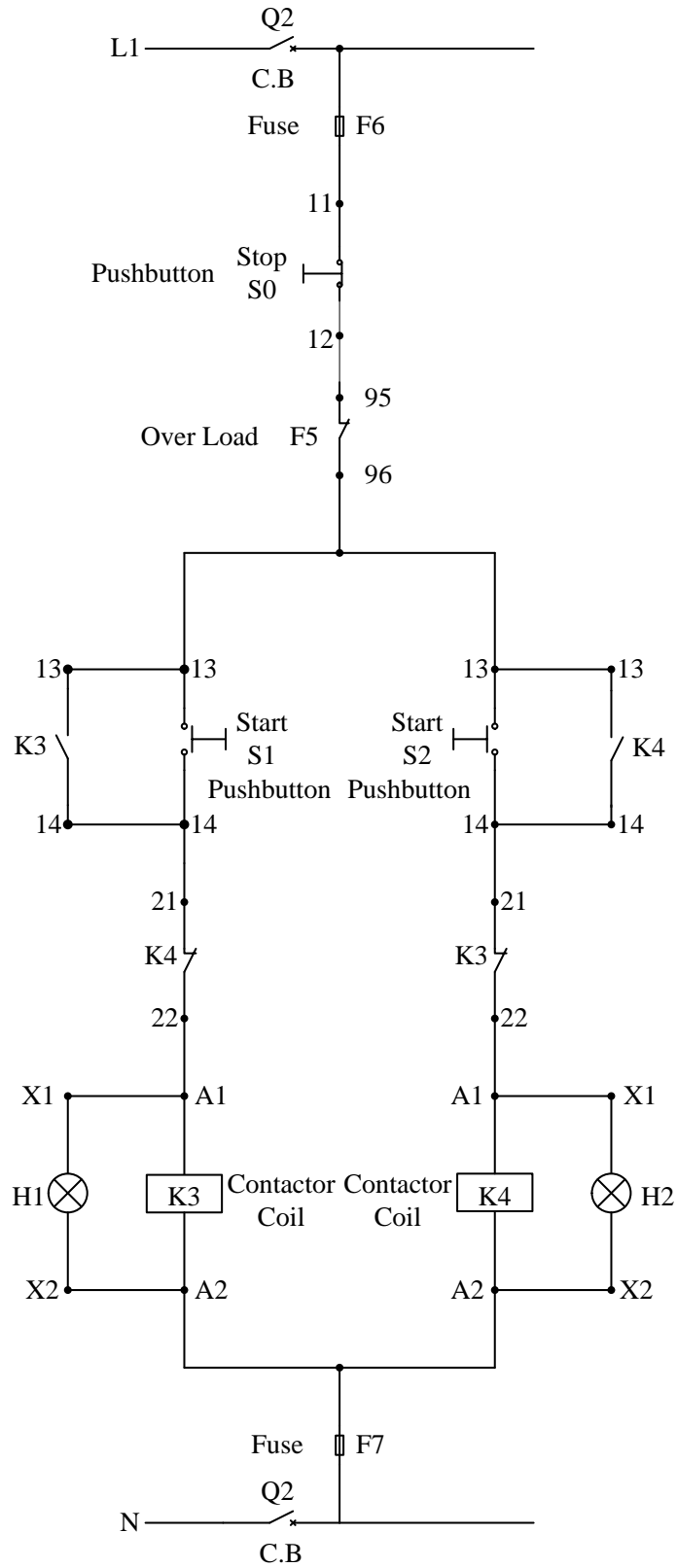
Indicating lamps and Pushbuttons
(board #1)



4- Connection



Power Circuit



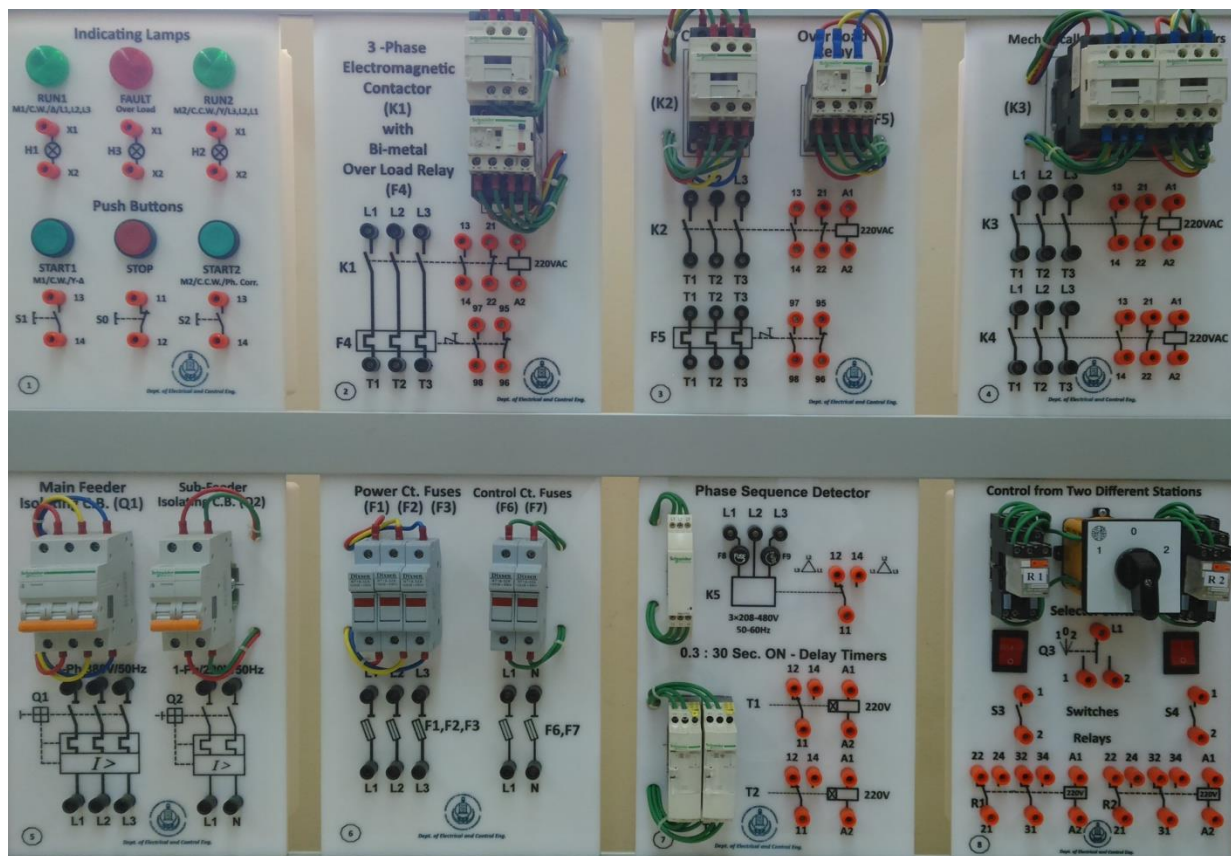
Control Circuit

Power and Control circuits connections diagram

5- Procedure

- Connect the circuits as shown in the diagram.
- Switch on the main and sub feeder isolating circuit breakers (Q1, Q2).
- Use the start and stop pushbuttons for motor operation.
- Press the forward direction pushbutton.
- Stop the motor and then press the reverse direction pushbutton to change the rotation of the motor.

6- Connect the power and control circuits on the following figure



7- Add your own comments

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8- Use internet resources to provide advantages, disadvantages and then discuss different applications of forward/reverse motor operation circuit

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