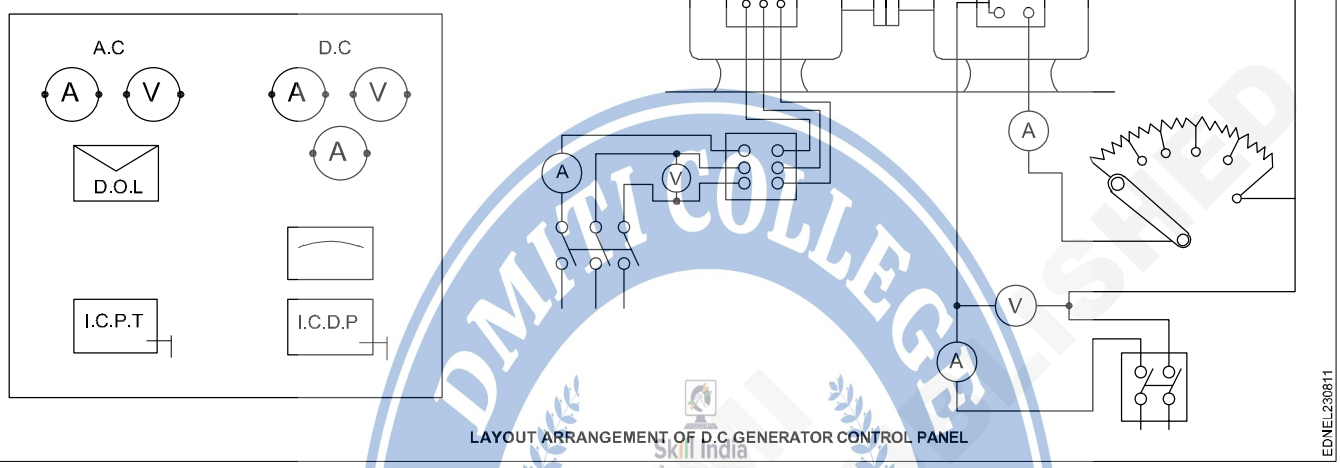
Reading of electrical wiring diagram and layout diagram

Layout arrangement of D.C Generator control panel (Fig 1)

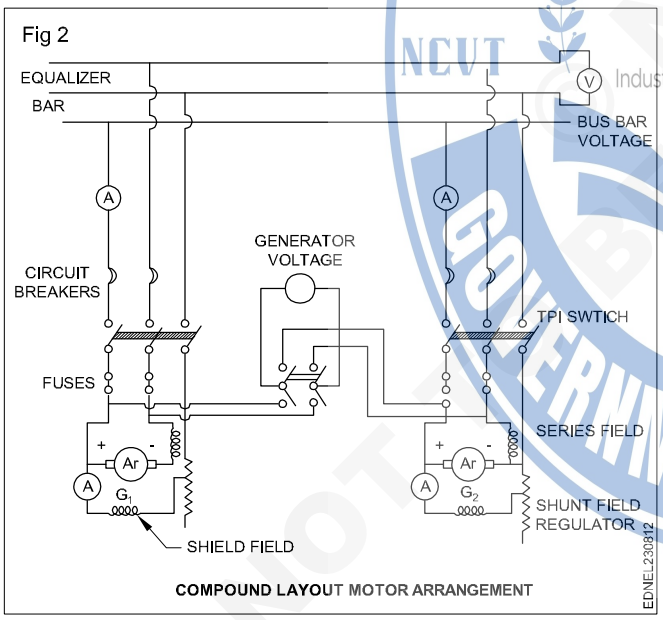
Fig 1



LAYOUT ARRANGEMENT OF D.C GENERATOR CONTROL PANEL

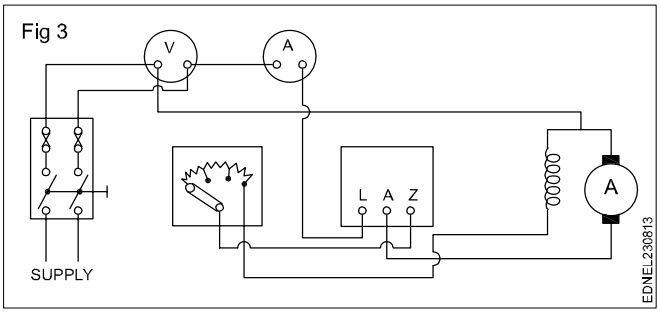
Compound motor layout arrangement (Fig 2 & 3)

Fig 2



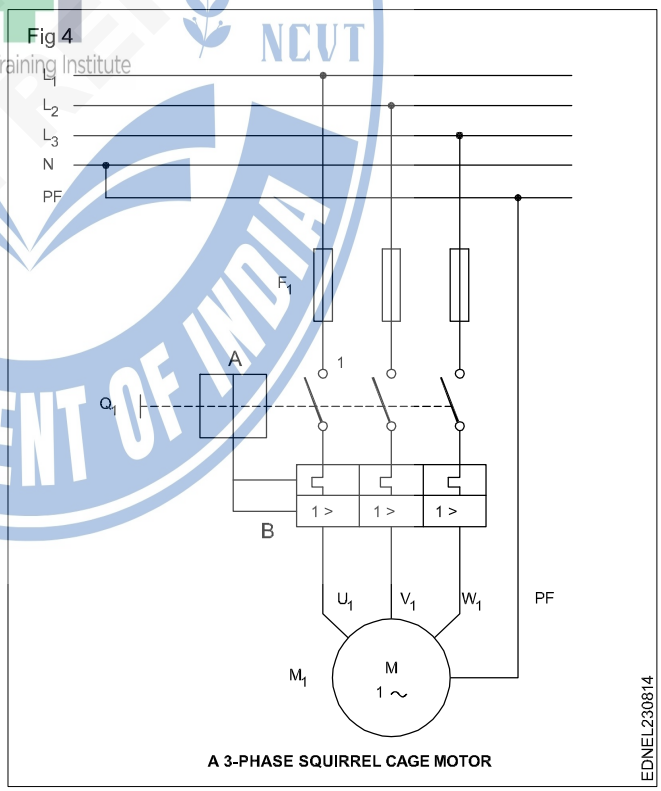
COMPOUND LAYOUT MOTOR ARRANGEMENT

Fig 3



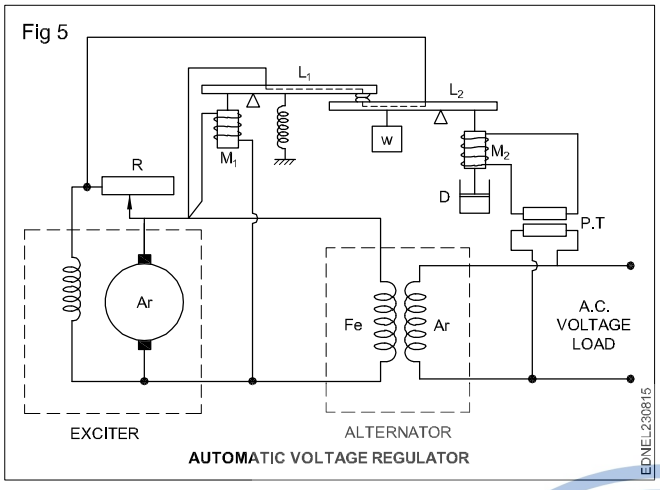
3-phase squirrel cage motor. (Fig 4)

Fig 4

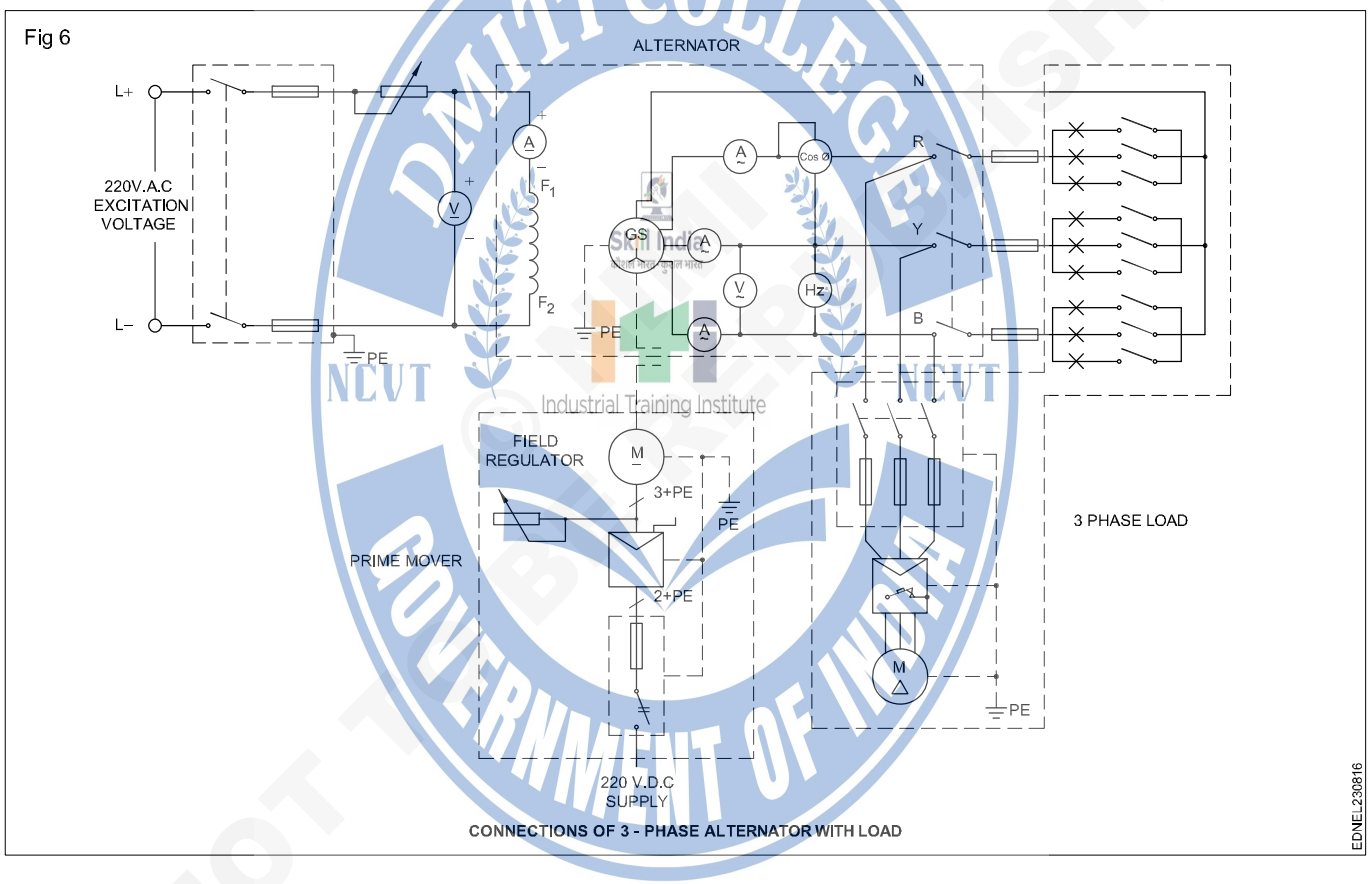


A 3-PHASE SQUIRREL CAGE MOTOR

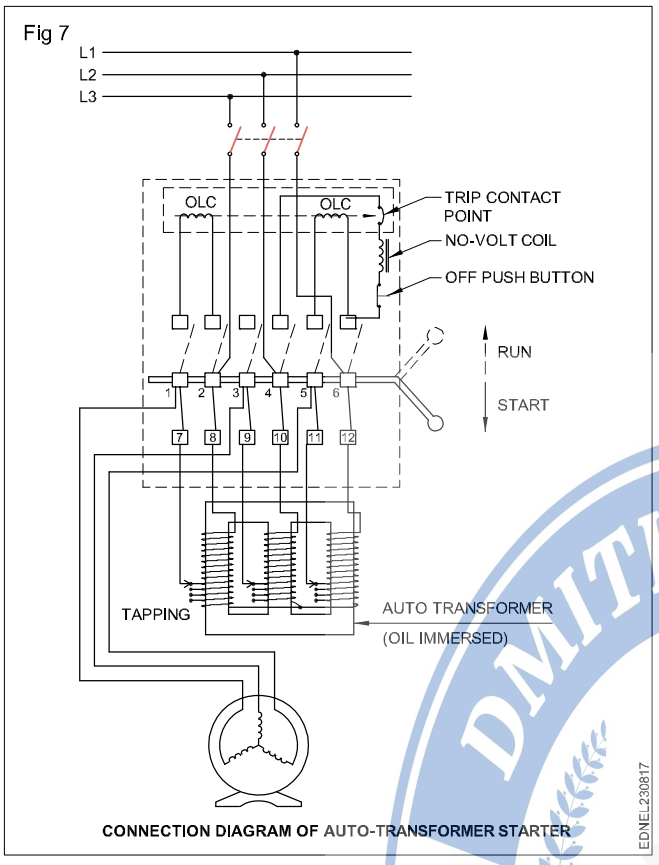
Automatic voltage regulation (Fig 5)



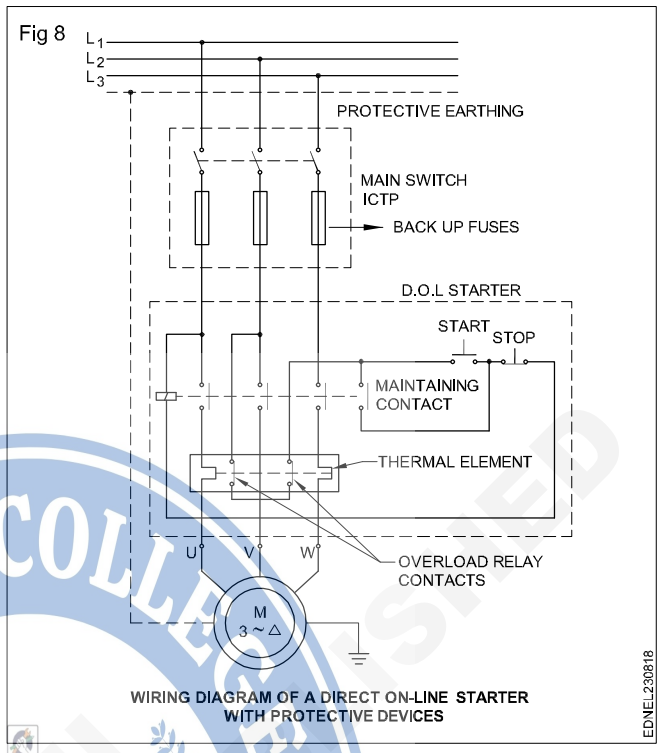
Connections of 3-phase alternator with load (Fig 6)



Connection diagram of auto-transformer starter (Fig 7)



Wiring diagram of a direct online starter with protective devices (Fig 8)



Reading of pipe earthing diagram

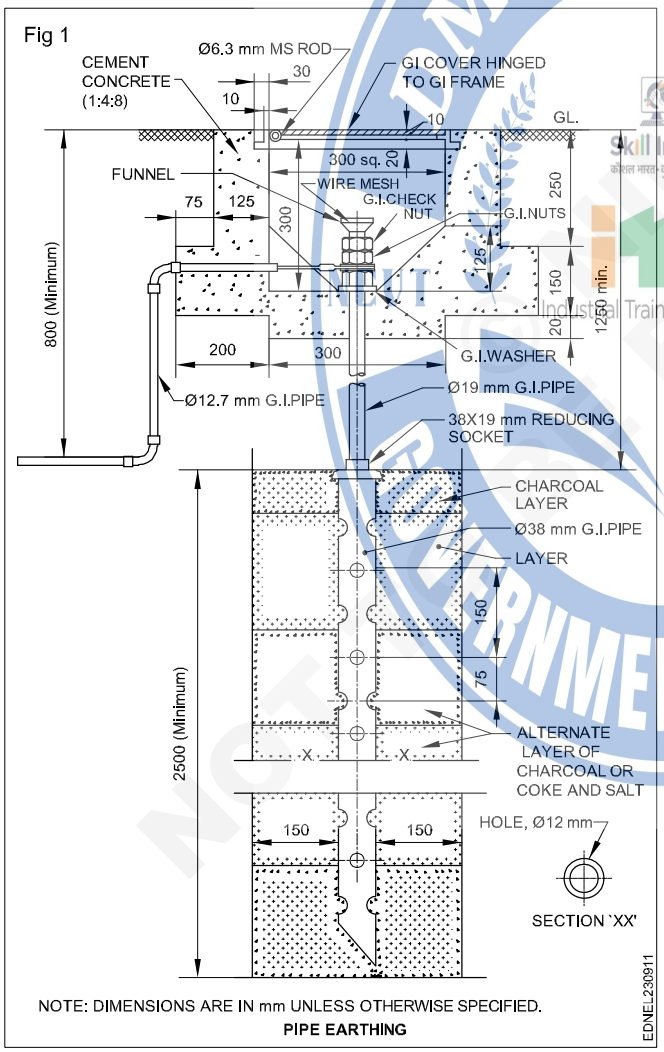
Earthing

General: In general all parts of an apparatus, other than the live parts, shall be at earth potential. For this earthing purpose, earth electrodes are used. These earth electrodes shall be provided at generating stations, substations and consumer premises. A number of earth electrodes in parallel is necessary to bring down the earth resistance to an acceptable low value such that the system's protective devices like earth fault relays and fuses operate properly in case of faults. As far as possible, these earth electrodes shall be visible.

Types of earth electrodes - Pipe earthing

Pipe electrodes (Fig 1): These electrodes shall be made of metal rod or pipe having a clean surface not covered by paint, enamel or other poorly conducting material.

Fig 1



NOTE: DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.

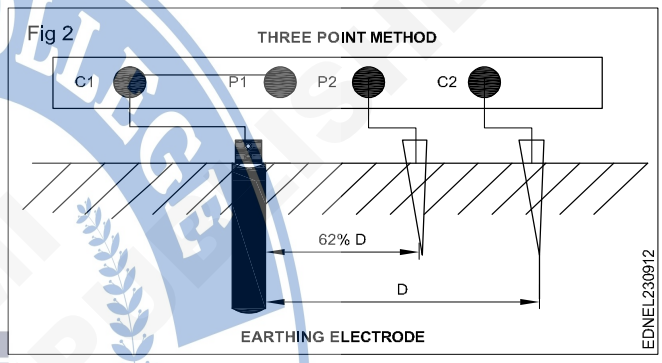
PIPE EARTHING

Measurement of earth resistance (Three point method)

In this method earth tester terminal C1 and P1 are shorted to each other and connected to the earth electrode (pipe) under test. Terminals P2 and C2 are connected to the two separate spikes driven in earth. These two spikes are kept in same line at the distance of 25 meters and 50 meters due to which there will not be mutual interference in the field of individual spikes. (Fig 2)

Suppose, the distance of Current Spike from Earth Electrode D = 60 ft, Then, distance of Potential Spike would be 62 % of D = 0.62D i.e. 0.62 x 60 ft = 37 ft.

Fig 2



Drawing the schematic diagram of plate earthing

Draw the schematic diagram of plate earthing

Plate electrodes (Fig 1): Plate electrodes,when made of galvanised iron or steel,shall not be less than 6.3 mm in thickness. Plate electrodes of copper shall be not less than 3.15 mm in thickness. Plate electrodes shall be of a size, at least 60 cm by 60 cm.

1 Which material is used for plate electrode?

2 What is the thickness of plate electrode?

3 How to reduce the earth electrode resistace?

Fig 1