Neutral Current Compensator

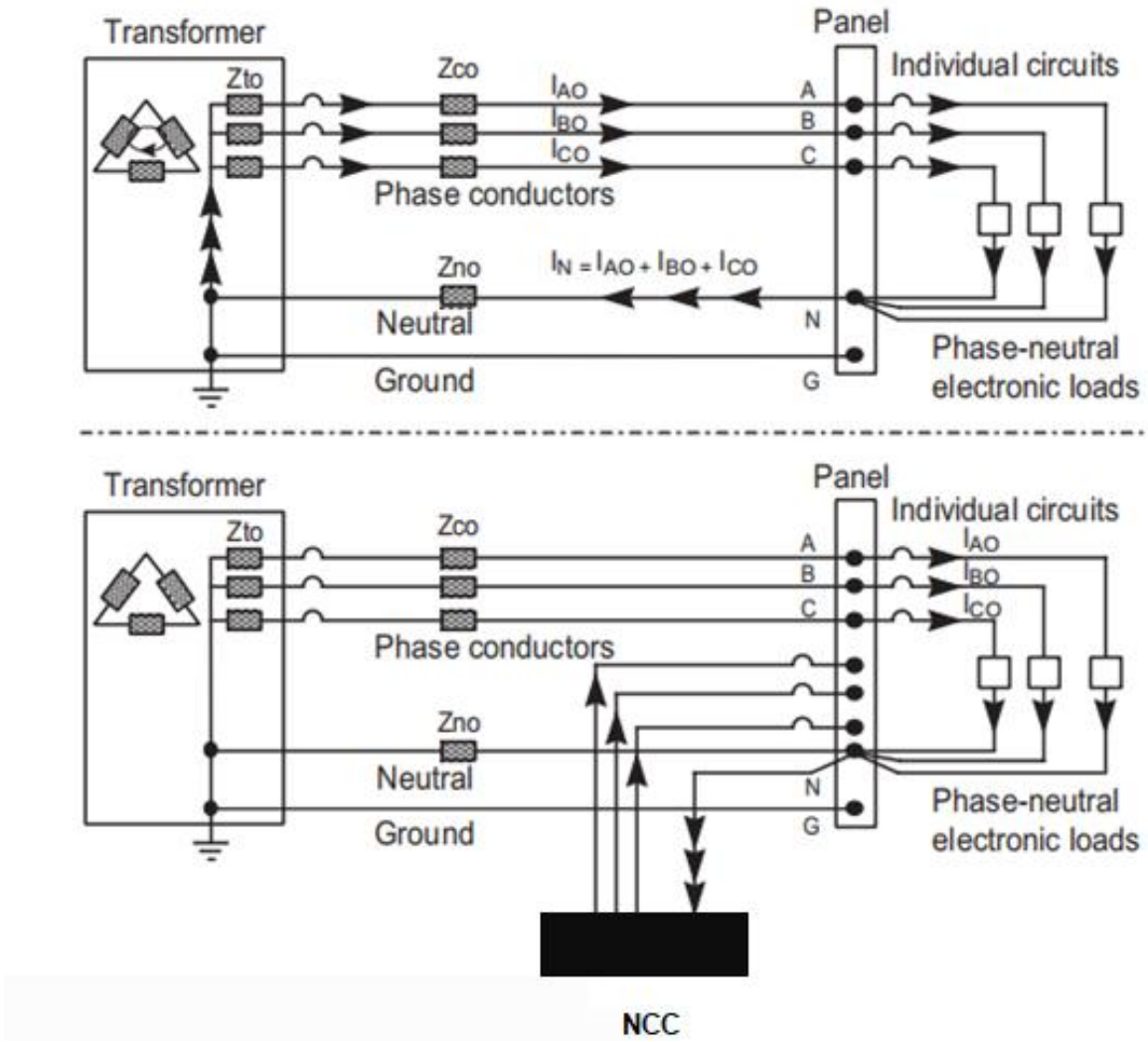
Neutral Current Compensator (NCC)

The Neutral Current Compensator is a parallel-connected, electromagnetic, zero sequence filter that removes 3rd and 9th harmonic currents as well as other zero sequence currents (Io) from the neutral conductor. The neutral current compensator presents a very low impedance alternate path for the neutral current to return to the phases because the windings of the neutral current compensator are configured to cancel the net flux created by the diverted neutral current. Neutral current, neutral-to-ground voltage, voltage distortion, and supply transformer losses are lowered because there is only a residual amount of 3rd harmonic and other zero sequence currents left in the neutral and phase conductors between the transformer and the NCC connection point.

The application of a neutral current compensator for the reduction of neutral current is advantageous due to passive compensation, rugged, and less complex over the active compensation techniques.

It is ideal and reliable compensation technique in three phase 4-wire or three phase 3-wire systems with unbalanced loads or loads generating harmonics.

The below figure shows how NCC removes 3rd harmonic from neutral conductor



Advantages:

1. Reduces the supply neutral current to near zero irrespective of the load neutral current caused by the linear and nonlinear loads
2. Maintains the supply neutral at near zero potential w.r.t. to earth, so the resistance of the neutral to earth connection and the earth pit resistance variations does not influence the neutral connection.
3. Even with un-grounded neutral or disconnection of system neutral, the neutral is provided through the neutral current compensator to the load. Hence, the voltage at load end is not affected by the floating of neutral and its effects of over-voltages.
4. It absorbs triplen harmonics generated by the load. The supply side triplen harmonic currents are reduced to a large extent. This in-turn reduces the losses associated with the harmonic currents and the overall energy consumption.
5. It is a passive compensation which is rugged and less complex over the active compensation techniques.
6. Economical and easy to maintain compared to the active compensation techniques.