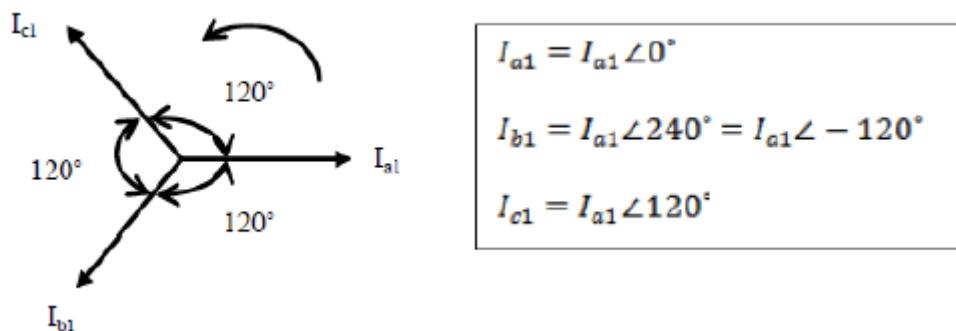# Symmetrical Components of a 3 Phase System

In a 3 phase system, the unbalanced vectors (either currents or voltage) can be resolved into three balanced system of vectors. They are Positive sequence components, Negative sequence components, Zero sequence components.
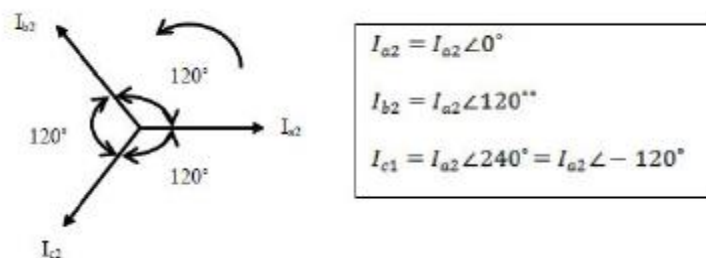Unsymmetrical fault analysis can be done by using symmetrical components.

Positive sequence components

It consists of three components of equal magnitude, displaced each other by 120° in phase and having the phase sequence abc.

$$I_{a1} = I_{a1} \angle 0°$$

$$I_{b1} = I_{a1} \angle 240° = I_{a1} \angle -120°$$

$$I_{c1} = I_{a1} \angle 120°$$

Negative sequence components

It consists of three components of equal magnitude, displaced each other by 120° in phase and having the phase sequence acb.

$$I_{a2} = I_{a2} \angle 0°$$

$$I_{b2} = I_{a2} \angle 120°$$

$$I_{c1} = I_{a2} \angle 240° = I_{a2} \angle -120°$$

Zero sequence components

It consists of three phasors equal in magnitude and with zero phase displacement from each other.

$$I_{a0} = I_{b0} = I_{c0}$$