ACB vs. ABC Power System Rotation in the T60

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DESCRIPTION

Applying an ACB power system rotation to the terminals of a transformer changes the phase relationship of the currents into and out of the transformer.

When the signals (currents and voltages) are received on the relay terminals in the ACB phase rotation sequence, change the **SYSTEM SETTINGS** ⇨⇩ **POWER SYSTEM** ⇨⇩ **PHASE ROTATION** setting to “ACB” to reflect this configuration.

EXAMPLE

Consider a system with a type Y/D30° transformer.

The **SYSTEM SETTINGS** ⇨⇩ **POWER SYSTEM** ⇨⇩ **PHASE ROTATION** setting is as follows:

- For an ABC power system rotation, set:
  SYSTEM SETTINGS ⇨⇩ **POWER SYSTEM** ⇨⇩ **PHASE ROTATION**: “ABC”
- For an ACB power system rotation, set
  SYSTEM SETTINGS ⇨⇩ **POWER SYSTEM** ⇨⇩ **PHASE ROTATION**: “ACB”

These settings are explained in detail as follows.

1. If ABC rotating power system is applied to the Wye terminals of the physically connected Y/D30° windings, the primary currents of the Delta winding lag the primary currents of the Wye winding by 30 degrees (see the figure on the following page).

   If the CTs are placed on both windings with their marked sides away from the power transformer, and the CT marked secondary sides are connected to the marked sides of the relay terminals, the angle seen on the relay between the currents of the Delta and Wye windings is 210 degrees (30° +180°).

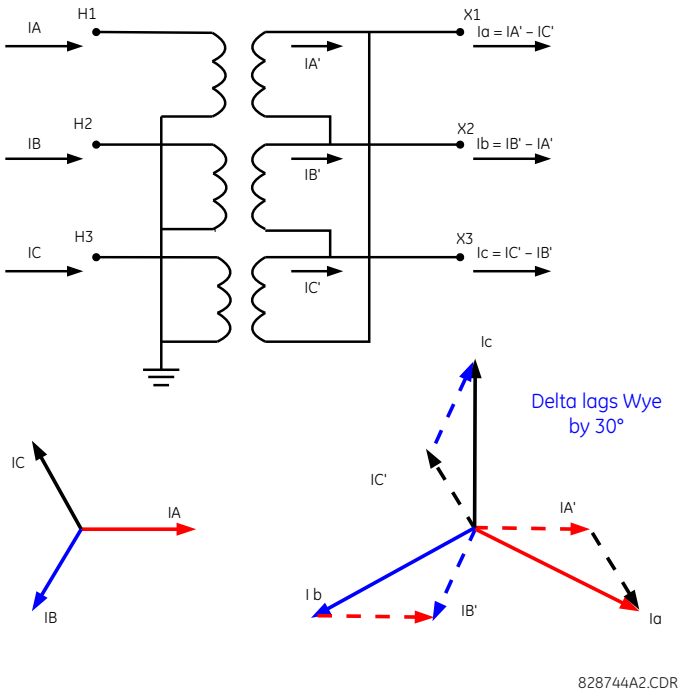

FIGURE 1. ABC Power System Rotation

2. Now, if an ACB rotating power system is connected to the same terminals of the physically connected Y/D30° transformer, the directions of the primary Wye and Delta currents change. In this case, the Delta primary currents lag the Wye primary currents by 330 degrees.

   Assuming mirror placed positive marks on the CTs for both windings, the angle between the secondary currents on the relay will be 150°. If Wye currents are taken as a reference, the Delta currents will be in 150° in the lag direction (see the figure on the following page).

   In this case, select the Y/D330° transformer type.

Cases have been reported where a phase rotation setting change on the relay has been forgotten. In such cases, the T60 differential algorithm can encounter non-zero differential current and hence operate.

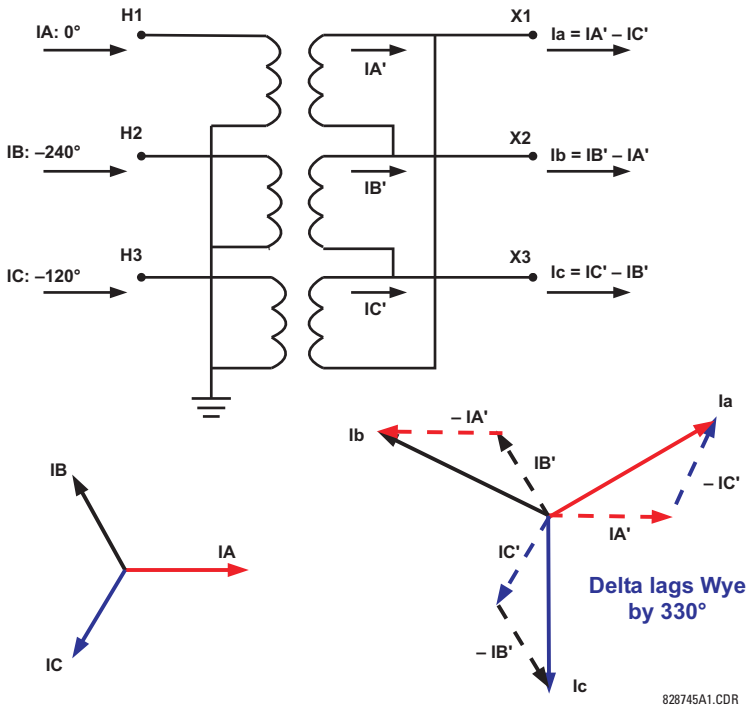

FIGURE 2. ACB Power System Rotation