EXPERIMENT NO. 10
DELTA-WYE AND WYE-DELTA CONNECTIONS

PURPOSE:

To show the operating characteristics of the Δ-Y and Y-Δ connections.

DISCUSSIONS:

A wye connected transformer has the advantage of requiring less insulation because
\[ V_{PH} = V_L / \sqrt{3} \, . \]

A delta connected transformer has the advantage of requiring smaller wire because
\[ I_{PH} = I_L / \sqrt{3} \, . \]

A combination of these connections can simplify the problems of high primary current and high secondary voltage or high primary voltage and high secondary current.

The Δ-Y and Y-Δ connections minimize these problems as illustrated in Figure 21. Also note that the turns ratio only affects direct primary to secondary relationships. Line to line relationships are related by \( \sqrt{3} \).
APPARATUS REQUIRED:

1. One Hampden T-100-34 Transformer
2. One Hampden RLC-100 resistance-reactance load
3. Two Hampden AC ammeters
4. One Hampden AC voltmeters
5. One portable AC voltmeter
6. One 208 volt three-phase power source

PROCEDURE:

1. Make the connection shown in figure 22. Adjust the load to approximately .3 amps and record the readings in all meters. Using the values of volts and amps in primary, calculate the values of volts and amps in secondary.

2. Make the connection shown in figure 23. Adjust the load to approximately .3 amps and record the readings in all meters. Using the measured values of volts and amps in secondary, calculate the values of volts and amps in primary.

REPORT:

Prepare a written report to include the following:

All the differences between the calculated values and experimental findings for the two circuits.