Three-Phase Transformers

All of these can and are used to indicate the winding connections:

IEEE Stds:

Schematic:

Circuit 3-line diagram:

IEC Stds: Dyn11

Fold-down diagram:

One-Line:
- Std 30° phase shift is often not the case!
How many possibilities are there for A-g or y-A phase shifts?

6 each

\[ \text{Total } = 12 \]

Relay: Broken A

Extended A

Auto - L

\[ \text{Angle: } 2 \text{i}g - 2 \text{ig} = 3V40 \]

\[ +30^\circ, +90^\circ, +150^\circ, +180^\circ \]
**Source**

\[ V_{A1} = V_{a1} (1/30^\circ) \]

**Pri PDS Seq Voltages**

**Sec PDS Seq Voltages**

**Pri PDS Seq Currents**

**Sec PDS Seq Currents**

\[ V_{A2} = V_{a2} (1/-30^\circ) \]

**Pri Neg Seq Voltages**

**Sec Neg Seq Voltages**

**Pri Neg Seq Currents**

**Sec Neg Seq Currents**

ANSI Standard 30-Degree Shift Wye-Delta
\[ V_{A1} = V_{a1} \left( 1/30^\circ \right) \]

\[ V_{A2} = V_{a2} \left( 1/-30^\circ \right) \]

ANSI STANDARD 30-DEGREE SHIFT DELTA-WYE