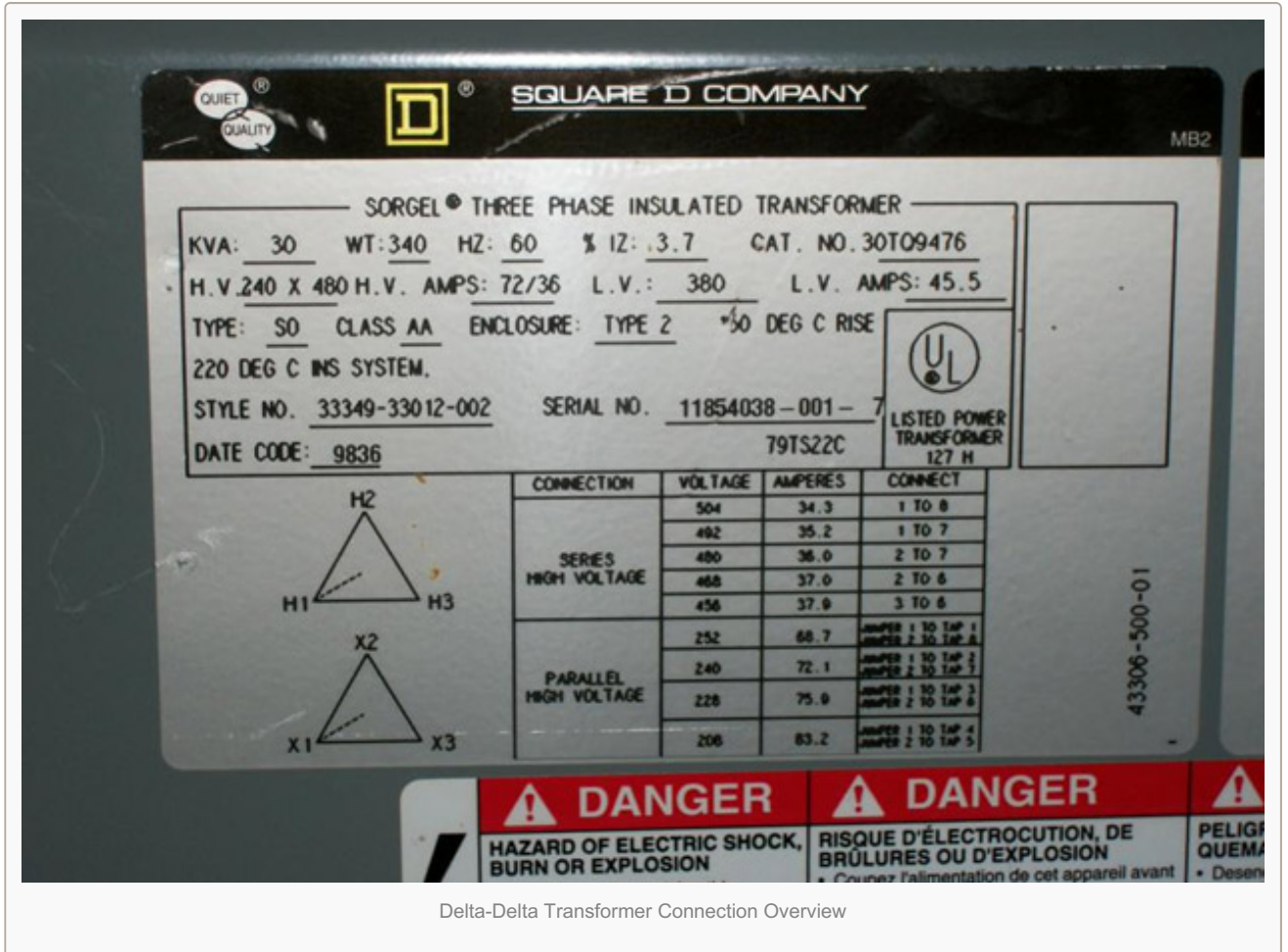


# Delta-Delta Transformer Connection Overview

jiguparmar



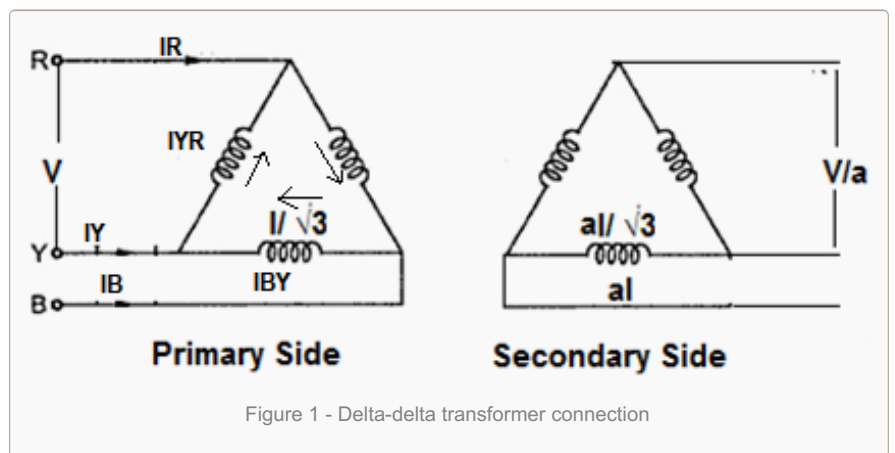
Delta-Delta Transformer Connection Overview

## Delta-Delta Connection

In this type of connection, both the three phase primary and secondary windings are connected in delta as shown in the **Figure 1**:

The voltages on primary and secondary sides can be shown on the phasor diagram (**Figure 2**):

This connection proves to be economical for large low voltage transformers as it increases number of turns per phase.



## Key points

1. Primary side **Line Voltage** = **Secondary Side Line Voltage**.
2. Primary side **Phase Voltage** = **Secondary Side Phase Voltage**.
3. No **phase shift** between primary and secondary voltages.

## Advantages of Delta-Delta Transformer Connection

### Sinusoidal Voltage at Secondary

In order to get secondary voltage as sinusoidal, the magnetizing current of transformer must contain a [third harmonic component](#). The delta connection provides a closed path for circulation of third harmonic component of current. The flux remains sinusoidal which results in sinusoidal voltages.

### Carry 58% Load if One Transformer is Faulty in Transformer Bank

If there is bank of single phase transformers connected in delta-delta fashion and if one of the transformers is disabled then the supply can be continued with remaining two transformers of course with reduced efficiency.

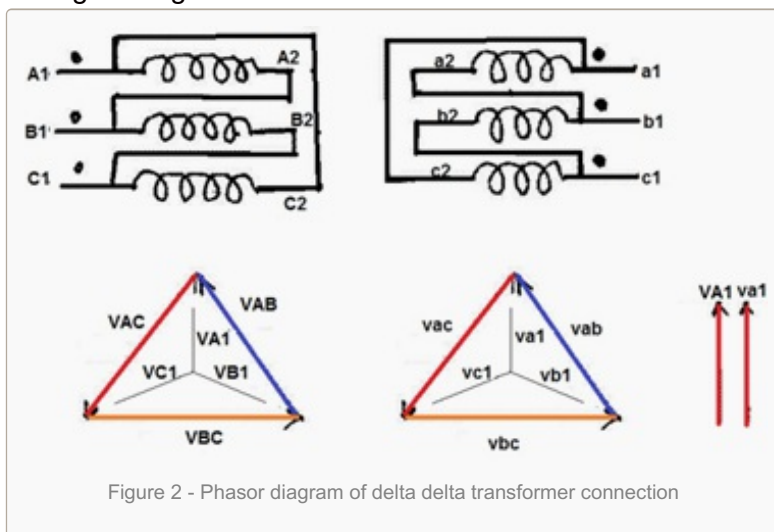


Figure 2 - Phasor diagram of delta delta transformer connection

### Economical for Low Voltage

Due to delta connection, phase voltage is same as line voltage hence winding have more number of turns. But phase current is  $(1/\sqrt{3})$  times the line current. Hence the cross-section of the windings is very less. This makes the connection economical for low voltages transformers.

### Absent of Third Harmonic Voltage

Due to closed delta, third harmonic voltages are absent. The absence of star or neutral point proves to be advantageous in some cases.

## Disadvantages of Delta-Delta Transformer Connection

Due to the absence of neutral point it is not suitable for three phase four wire system.

More insulation is required and the voltage appearing between windings and core will be equal to full line voltage in case of earth fault on one phase.

## Application

1. Suitable for large, low voltage transformers.
2. This type of connection is normally uncommon but used in some industrial facilities to reduce impact of SLG faults on the [primary system](#).
3. It is generally used in systems where it need to be carry large currents on low voltages and especially when continuity of service is to be maintained even though one of the phases develops fault.

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