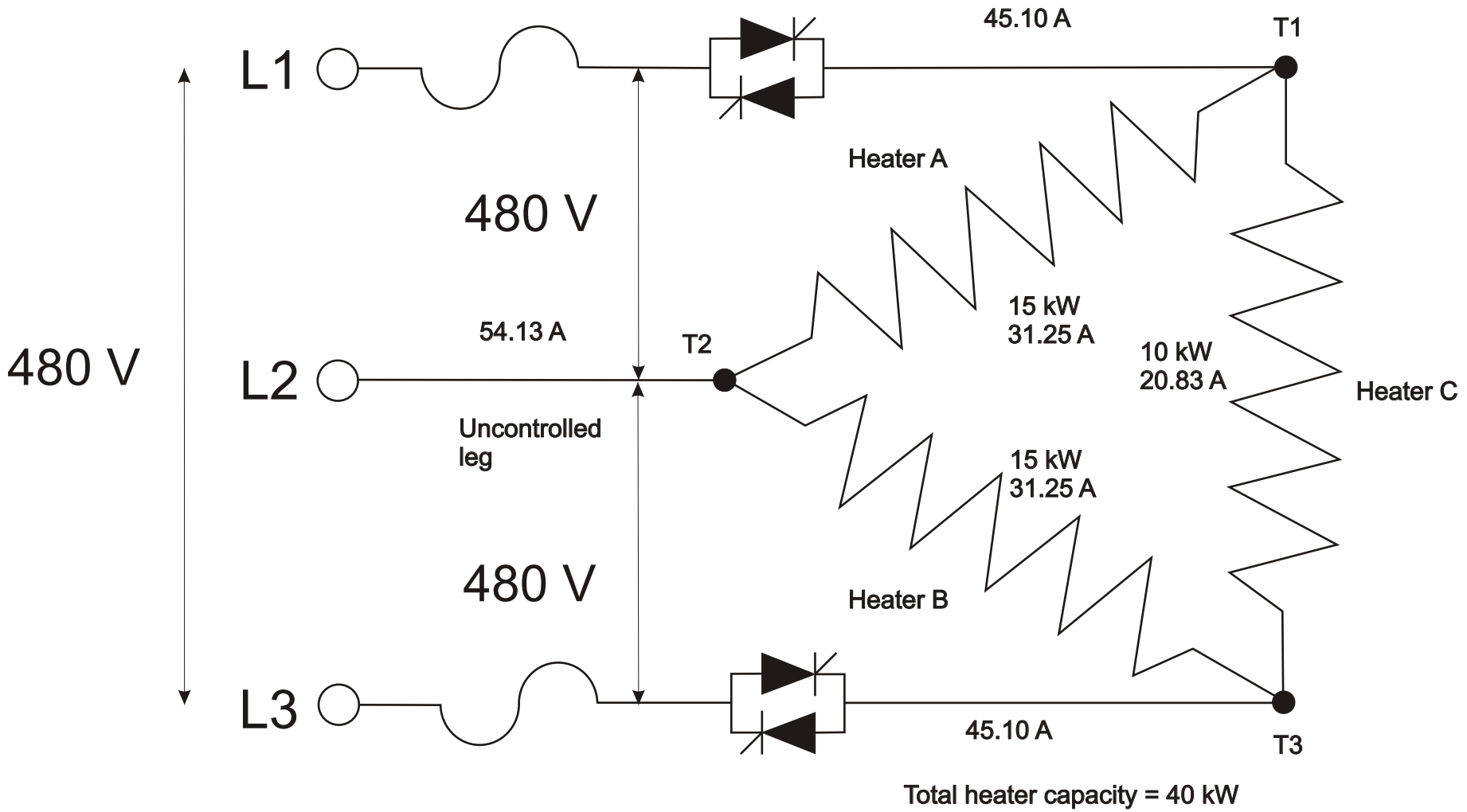
3-Phase, 2-leg Delta Unbalanced Load Current Calculations



Note: Unbalanced load should not be used on QPAC model Q33.

Assume we have three heaters rated at 480 Volts.

Heater A = 15,000 Watts
Heater B = 15,000 Watts
Heater C = 10,000 Watts.

If we place -

Heater A between T1 to T2
Heater B between T2 to T3
Heater C between T1 to T3
then we can calculate the currents as follows:

1. Determine inside delta amperes by dividing heater wattage by line to line voltage.
   W / V = A where W = Watts, V = Line voltage, A = Current in Amperes.
   1.1. To calculate inside current T1 to T2, 15,000 W / 480 V = **31.25** A
   1.2. To calculate inside current T2 to T3, 15,000 W / 480 V = **31.25** A
   1.3. To calculate inside current T1 to T3, 10,000 W / 480 V = **20.83** A
2. Determine the average amperes in each leg by adding the two legs that contribute to a particular line or phase then divide by two.
   2.1. To calculate average current T1 to T2, 31.25 A + 31.25 A = 62.45 A / 2 = **31.25** A
   2.2. To calculate average current T2 to T3, 31.25 A + 20.83A = 52.08 A / 2 = **26.04** A
   2.3. To calculate average current T1 to T3, 31.25 A + 20.83 A = 52.08 A / 2 = **26.04** A
3. Multiply the average currents by 1.732 to get line current.
   3.1. To calculate line current T1 to T2, 31.25 x 1.732 = **54.13** A
   3.2. To calculate line current T2 to T3, 26.04 x 1.732 = **45.10** A
   3.3. To calculate line current T1 to T3, 26.04 x 1.732 = **45.10** A

To check your calculations for current you can work the formula backwards. You should have a result that equals the total 3-phase wattage. Example: 54.13 A + 45.10 A + 45.10 A = 144.33 A / 3 = 48.11 A average
Now take average amperes of 48.11 A x 480 V = 23,092.8 W x 1.732 = 39,997 Watts total heater.
Rounding errors account for the difference from 40,000 to 39,997 watts.