

## Tech Tip Transformers

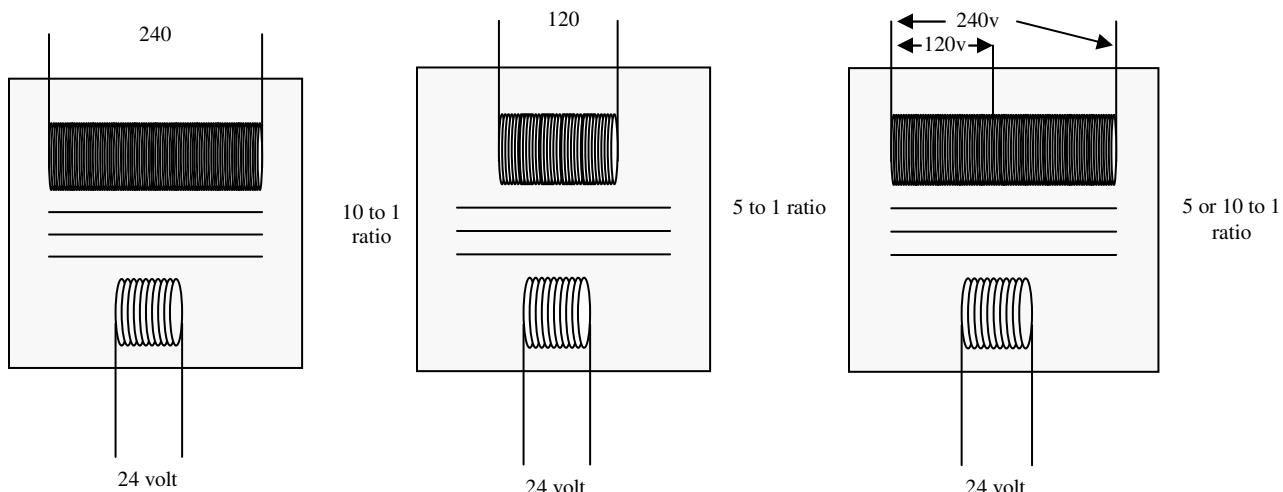


Transformers are often taken for granted in our industry because they are a fairly reliable device constantly providing low voltage power to the control circuit.

Techs typically understand that there should be primary voltage supplied to the line side and secondary voltage is produced on the low side. This is known as a Step Down Transformer because it steps down the voltage from a high 240v or 120v to a low 24v.

Because of the magnetic field around a wire exists we can take a coil of wire with high voltage running through it and lay it next to another coil of wire and the magnetic lines of flux will induce a voltage into the new coil.

The amount of input voltage and the number of coils will determine the amount of output voltage being produced. A combination transformer may have different voltage taps off of one coil.



Most techs know that the VA rating is how strong the transformer is, but few make the connection that the **VA is Volts x Amps = Watts**.

This piece of information is very helpful when sizing or replacing a transformer.

Knowing that a 40VA transformer will produce 24 volts, Ohms law can be used to determine what amperage the transformer can operate at before burning up.

**40 Watts / 24 Volts = 1.66 Amps.** This 1.66 Amps is the amount of current that can safely be drawn on the 24volt R or C control circuit wire.

- Place an Ammeter on the R or C wire of a 40 VA transformer that has been replaced.
- Turn the Tstat to the “fan on” position
- If the amperage is below the 1.66 try “cool and 60”.
- If it is still below try “heat and 90”.
- If all of these readings are OK then the transformer should be OK to run.

If any of those readings are excessive then you should check that circuit for shorts/grounds or possibly too many coils added such as 24v zone control dampers.

In this case a 60 VA or greater may be a better choice for replacement.

**60 Watts / 24 Volts can handle up to 2.5 Amps.**