

February 7, 2011

DC Field Resistance Variables

When performing DC resistance measurements on the field of a DC or Synchronous motor it is common to compare the measured value to the calculated resistance using nameplate data and ohms law. For a field with a 300 volt, 1.18 amp nameplate you would expect a non-temperature corrected resistance value of around 254 ohms ($R=V/I$). Will this match a measured value of resistance? Maybe. However, here are some reasons why it might not:

- The nameplate current is typically based on the motor running at rated design temperature. Resistance during predictive testing is usually measured at a lower temperature and is often not temperature corrected.
- A temperature corrected resistance measurement may not be corrected to the same value as the nameplate(ex. 40C vs. 25C).
- Voltage delivered to the field may differ from nameplate, which would change the current reading for the same resistance.
- Power supplied to DC fields is often from a rectified supply (single or three phase). Due to ripple, measured voltage and current may be inaccurate based on the meter used. Is it a true RMS meter?
- The armature and field may be in parallel during the measured resistance.

You are invited to submit an Electric Motor Testing Tip of your own and receive a free PdMA mug or hat if we publish it! Contact Lou at 813-621-6463 ext. 126 or lou@pdma.com.