
November 29, 2011

The Right Range

You have heard the phrase, "Use the right tool for the job." We propose a similar phrase, "Use the right range for the reading." It is not unusual to see a large three-phase induction motor with phase resistance perfectly or closely balanced in the milli-ohm to micro-ohm range with an imbalance calculating well below 0.1%. With this kind of manufacturing precision, the balance of resistance measurement can be a very sensitive indicator of a changing condition in the motor windings or circuit. Although we direct your attention more to inductance and impedance for identifying winding degradation, strong consideration should be given to establishing a change from baseline caution and alarm set point for balance of resistance. The recommended change from baseline alarm set points are caution at a 50% increase and alarm at a 100% increase.

Here is an example of the importance of establishing these alarm levels. A motor tests at baseline with a .1% balance of resistance. Two years later the balance of resistance test in the field was 1.5%. A balance of resistance of 1.5% may not seem extreme, and decade old alarm set points may not alert you to the dangers. However, when compared to the baseline it is over a 1000% increase and immediately needs to be investigated further. This type of precision analysis requires more than your standard multi-meter. To view the precision resistance measurement capability of the MCE go to <http://www.pdma.com/PdMA-MCE.php> and click on specifications.

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.