

If the apparatus you are testing has very small capacitance, such as a short run of house wiring, the spot reading test is all that is necessary. However, most equipment is capacitive and so your very first spot reading on equipment in your plant, with no prior tests, can be only a rough guide as to how good or bad the insulation is. For many years, maintenance professionals have used the one-megohm rule to establish the allowable lower limit for insulation resistance. The rule may be stated:

Insulation resistance should be approximately one megohm for each 1,000 volts of operating voltage, with a minimum value of one megohm.

For example, a motor rated at 2,400 volts should have a minimum insulation resistance of 2.4 megohms. In practice, megohm readings normally are considerably above this minimum value in new equipment or when insulation is in good condition.

By taking readings periodically and recording them, you have a better basis of judging the actual insulation condition. Any persistent downward trend is usually fair warning of trouble ahead, even though the readings may be higher than the suggested minimum safe values. Equally true, as long as your periodic readings are consistent, they may be ok, even though lower than the recommended minimum values. The curves of Fig. 7 show typical behavior of insulation resistance under varying plant operating conditions. The curves were plotted from spot readings taken with a Megger instrument over a period of months.