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Three-phase motors are frequently used in commercial settings due to their high operational capacity, durability, and energy efficiency. Did you know that three-phase electric motors account for approximately 40% of industrial energy use, according to the U.S. Department of Energy? However, if not operated properly, they can lead to short-circuited or burnt windings. Therefore, it's essential to test a three-phase electric motor regularly to avoid significant damage. To inspect the health of a three-phase electric motor, follow these primary steps: 1. Voltages and Current Measurement: Measure the applied voltages and currents (FLA) using a multimeter. The expected voltages for three-phase between phase and neutral is 230V and 400V between the phases. Record the result and check if the FLA is equivalent to the nameplate or not. Variance in the motor's current and amperes indicates active malfunction or failure. 2. Winding Test: Three-phase motor winding tests are crucial to signify any defects and damage in the windings. These tests can help to detect if your winding is shorted or burnt. * Check the continuity of motor winding from phase to phase (U to V, V to W, W to U). If all phases have satisfactory continuity, your motor winding is error-free. * Inspect the winding resistance from phase to phase terminals (U to V, V to W, and W to U). Since all three phases usually have unvaried windings, the ohm reading must be quite similar. * Run the insulation resistance test by applying 500V DC current to test the resistance of the insulation between the winding and motor frame (earth). Check the resistance from phase to phase and phase to earth. The minimum insulation resistance is 500 megaohms. 3. Load Test: Load tests are important to indicate the power factor, torque, efficiency, and power output of the motor. It can be done with two types of tests: * Run the motor without any load and measure voltage and current. Now, check if the recorded voltage and current are in the specified range and balanced or not. * Check the voltage and current at full load and measure the current and voltage values. The current should be less than 10% of the load rating, the power factor should be at least 0.8, and while voltage should be within a few percent of the full rating. 4. Temperature and Vibration Inspection: Check the motor temperature with a thermometer to evaluate if the motor is ventilated, lubricated, and not exceeding the ambient temperature. Now measure the vibrations to identify any mechanical stress, bearing issues, or misalignment. These check-ups ensure the motor's lifespan To detect any faults, it's crucial to test a three-phase electric motor. This can help prevent motor failure or burnout. Xinnuo Motor is a leading manufacturer of high-quality and long-lasting 3-phase electric motors. Every 3 phase motor has six (6) terminals, with the supply voltage connected to three (3) of those terminals. The most common configuration is the Delta (Δ) - Star (Wye) configuration, where the Delta side is connected to the supply voltage. The terminal configuration of a 3 phase motor consists of two sets: W2U2V2 (star side) and U1V1W1 (Delta side). Although 3 phase motors are rugged equipment, they can fail due to old age, misapplication, mal-operation, or other adverse causes. The most common failure mode is burnt winding or shorted winding, leading to damage. To determine a motor's health, it's essential to test the windings with a multimeter or ohmmeter. A simple ohmmeter test across the windings can reveal whether the motor is good or bad. Given article text here The electrical equipment used in motors, such as motors, transformers, cables, insulators, etc., have an important value of insulation resistance expressed in kilo-ohm and mega-ohm. The megger is a type of insulation meter, which consists of a DC generator and Ohm meter. The quality of the insulation plays a vital role in the proper functioning of electrical equipment. However, it deteriorates with changes in temperature, environment conditions, aging, etc. To ensure safe performance of the megger test on an induction motor, we need to check the following safety measures beforehand. First, inspect the meggar leads for any physical damage and check their continuity while the megger is turned on. Also, verify that the wiring setup is correct and all connections are tight. Barricade the area where the megger test is being performed. The steps involved in performing a megger test on an induction motor are as follows: Disconnect the motor from the power source and discharge the stator by shorting its terminals to ground. Connect one of the stator terminals to the motor body using the megger leads. Apply twice the operating voltage between one phase and the motor body. If the rated voltage is 440 volts, apply 880 volts. Set the Megger voltage as defined in step no.3 and press the test button on the megger. Note down the insulation resistance value. If the megger reads zero, it indicates that any of the three windings of the stator may be earthed. In a star or delta configuration, there is no need to test the Megger value at different points of connection terminal. If the insulation resistance value is high, such as above 1 Mega-ohm for a 440-volt motor, it indicates good motor winding insulation. After the megger test, connect the winding to earth to discharge the built-up voltage. This method allows testing three-phase motors with a megger. The insulation resistance or Megger value of motor winding depends on various parameters, such as dirt, moisture, corrosion, and weather conditions. Therefore, periodic measurement of the Megger value is necessary for enhancing the useful life of the motor.

How to test a 3 wire electric motor. How to test 3 phase motor with multimeter. How to test a 3 phase motor. How to test a 3 phase electric motor with a multimeter. How to tell if a motor is 3 phase.