



Perform an Insulation Resistance Test on a Motor

Program: Electrician Technician

Course: EL¹70 – Motor and Industrial Motor Controls

Objectives: Under the supervision of your instructor, you should be able to do the following:

- Measure motor winding insulation resistance and compensate for temperature.

Lab Equipment:

- 1 – Nine-lead, dual-voltage three-phase motors

Required Tools:

- 1 – Pencils and paper
- 1 – Calculator
- 1 – Wire Brush
- 1 – Megohmmeter
- 1 - Pair of wire Strippers
- 1 – File (if needed)
- 1 – Bulb

Materials:

- N/A

Safety (PPE):

- Safety glasses

Resources: N/A

Time Required: 120 Minutes

Shop Maintenance:

- All work will cease 20 minutes prior to the end of class.
- All work areas must be cleaned.
- Tools and equipment must be cleaned and returned to the designated areas (cage, tool room, cabinets etc.)
- Any broken or missing tools must be reported immediately.
- Tools and equipment are student's responsibility



Procedures: (Eye protection must always be worn) **WARNING!**

Megohmmeters produce high voltage levels. Do not touch the test leads or motor frame while the instrument is in use.

Have your instructor show you the proper and safe usage of the megohmmeter. Become familiar with its use.

1. Prepare the motor T-leads by separating and exposing the bare ends of all nine leads in the motor termination box.
2. Locate and wire brush/file, if needed, an area on the motor housing that will easily accommodate the alligator clip on the megohmmeter lead end.
3. Clip the positive megohmmeter lead alligator clip to the motor frame.
4. Locate one of the two T-leads for a winding segment and clip the negative megohmmeter test lead it.
5. Ground the leads of all the other segments to the motor frame.
6. Crank the megohmmeter handle (on manual models) or press the megohmmeter TEST button (on electronic models) for approximately one minute.
7. Record the reading in the space provided on Figure 1.
8. Discharge the tested segment T-lead to the motor frame for four minutes.
9. Repeat Steps 5 through 9 for each of the winding segments.
10. Use the thermometer to determine the skin temperature of the motor.
11. Record this temperature in the spaces provided on Figure 1.
12. Record a multiplication factor (Kt) in the spaces provided on Figure 1 as determined from the temperature coefficient chart supplied with the megohmmeter.
13. Multiply the insulation resistance readings by the multiplication factor (Kt) entered in 1. Step 13 and enter the results in the adjusted reading spaces provided on Figure 1.
15. Remove the megohmmeter test leads.
16. Have your instructor check your work.

Figure 1- Winding Resistance Test Record

T-Leads	Reading	Winding Temperature	Multiplication Factor (Kt)	Adjusted Reading
T1				
T2				
T3				
T4				
T5				
T6				
T7				
T8				
T9				