



POLARISATION INDEX TEST

IDENTIFIABLE FAILURE MODES

- Contamination to stator and rotor windings.
- Thermal ageing or deterioration to stator windings.
- Moisture to motor circuits.

DESCRIPTION

The PI test is the application of a predetermined DC voltage between an insulation system and ground for 10 minutes.

A clean, dry, healthy insulation system will exhibit a steady increase in RTG value for the duration of the test. This is indicative of a decrease in the absorption current due to polarisation of the insulation molecules.

The measured resistance is recorded every 5 seconds and graphed and the value at 10 minutes is divided by the value at 1 minute to give a PI ratio. The resulting graph gives a PI profile that gives further information to assist in the analysis of the insulation system.

The test can be applied to stator and rotor windings on asynchronous motors, stator and rotor windings on synchronous motors and the armature and field windings on DC motors.

ANALYSIS APPLICATION

Since the results are ratios, temperature correction of the RTG values is not required.

Four currents affect the PI test results (capacitive, absorption, surface leakage and conduction) and are to be taken into consideration when analysis of the PI profile is carried out.

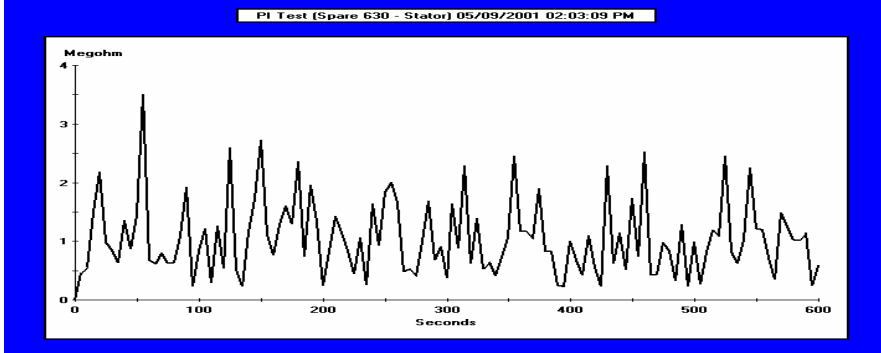
An erratic or declining PI profile should be investigated to determine the cause of the unsatisfactory readings.

Some semi-conductive coatings used in HV motor windings may lower the PI ratio in some cases.

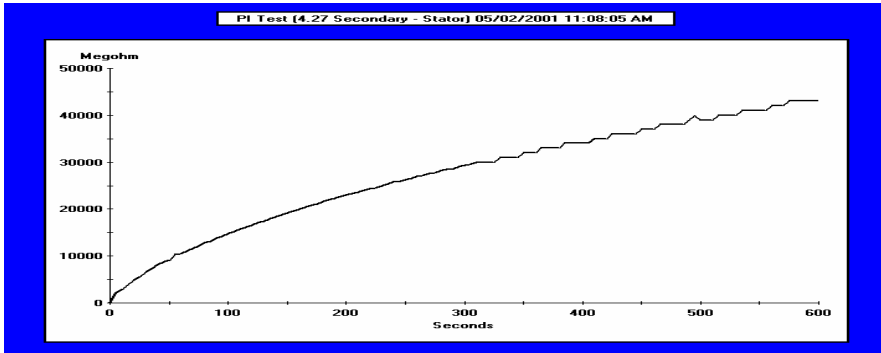
If the 1 minute RTG is > 5000 Mohms, the calculated PI ratio may not be meaningful however analysis of the PI graph profile should still be undertaken.

APPLICABLE STANDARD / ACCEPTANCE CRITERIA

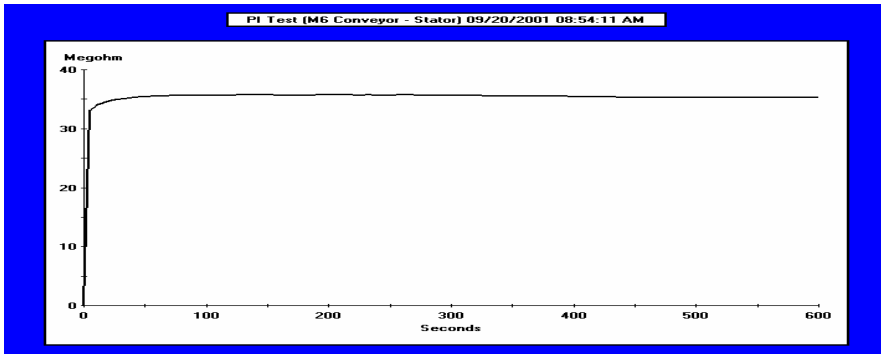
The referenced standard for DA tests is IEEE 43-2000



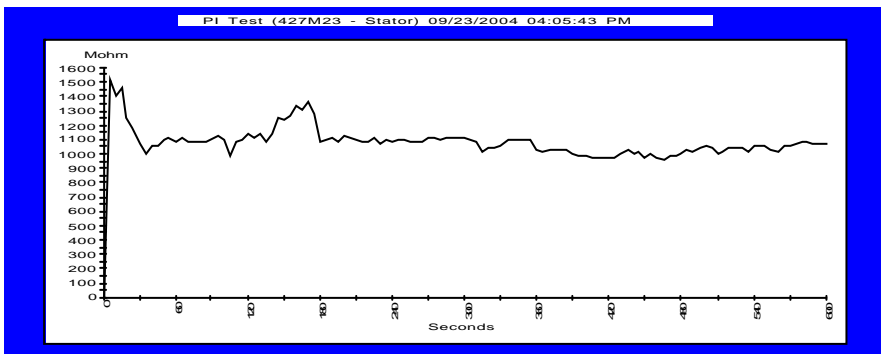
A PI graph from an endwinding contaminated with carbon.



A Satisfactory PI graph



A PI graph indicating moisture



Mechanical and thermal damage to insulation system