

ELECTRICAL MEASUREMENT & MEASURING INSTRUMENTS

UNIT 1 Part B

Analog Measurement of Electrical Quantities

Pressure coil capacitance

- The pressure coil circuit may have capacitance in addition with inductance. This capacitance mainly due to the inter turn capacitance of the series resistance. The effect of capacitance is opposite to that due to inductance. Therefore the wattmeter will read high when the load power factor is leading.
- The inductance in pressure coil circuit will always more than inductance, hence the error caused by capacitance will be nullified by that due to inductance.

Error due to mutual inductance

- Errors may occur due to the mutual inductance between the current and pressure coils of the watt meter. These errors are quite low at power frequencies. But they increased with increase in frequencies.
- The effect of mutual inductance can be avoided by arranging the coil system in such a way that they have no mutual inductance. So we can eliminate the errors due to mutual inductance. The Drysdale Torsion head wattmeter is an example for such type.

Eddy Current errors

- Eddy currents are induced in the solid metal parts and within the thick conductors by the alternating magnetic field produced by the current coil.
- These eddy currents produce their own magnetic field and it will alter that produced by the main current in the current coil and thus error occurred.