Measurement of current using current transducer

Objective

To measure the current output using a current transducer.

Theory

A transducer is a device which generates usable output, in response to a specified measurand. The output is an electrical quantity and measurand as a 'Physical quantity, property, or condition which is measured'.That means transducer is a device which can convert 'non electrical quantity', into an electrical form. Transducer can convert different types of electrical inputs like resistance, inductance into a suitable output.

The term current transducers, however, is usually used to describe devices that convert alternating current(AC) or direct current (DC) electrical signals into analog instrumentation signals used in industrial control systems. Current transducers are passive transducers which use the external power for transduction from an auxiliary power source. In case of higher range of current, a current transformer is utilized to step down the current to required input level.

Here, Current transducer is used to convert AC current into 0 to 5 volt DC voltage. AC current is applied in the input terminals (1 & 3) using autotransformer. An ammeter and bulb load are connected in series with terminals 1&3. Auxiliary supply is applied at terminal 13 & 14, digital multimeter is connected with terminal 17&18, which measures output dc voltage. Digital multimeter is connected to check whether the voltage output is less than 3 volt or not.

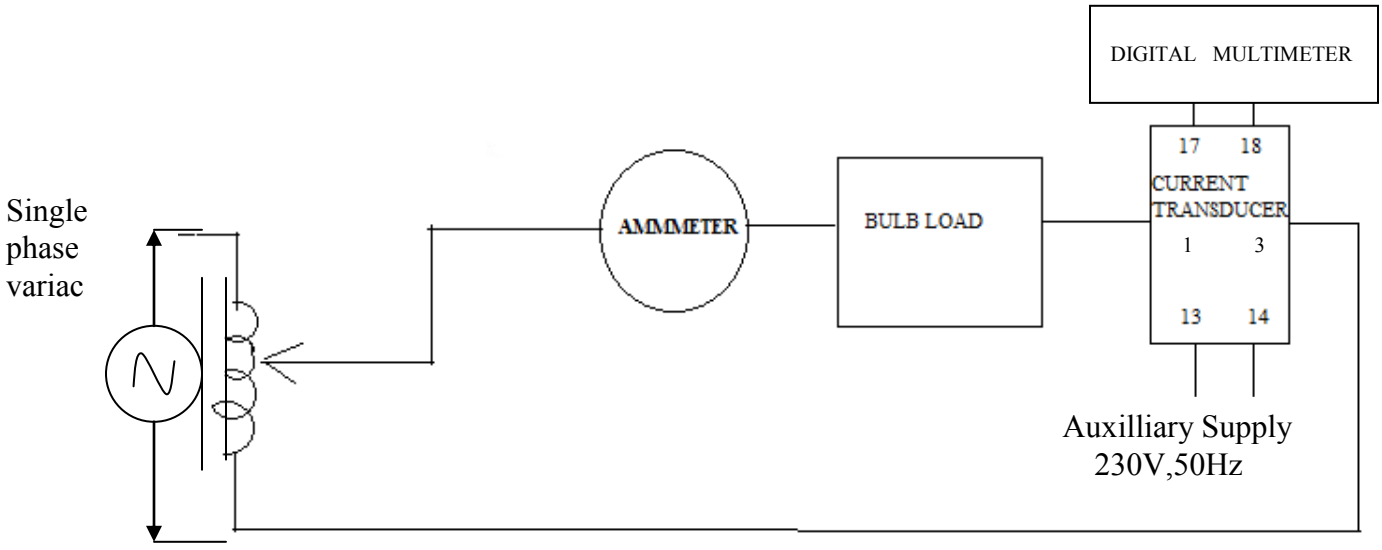

Figure : Circuit diagram for current measurement using current transducer

Observation Table

Sl. No.	Input Current (A)	Transducer Output DC Voltage (V)	Calibration Error

Calculation:

Calibration Error = (True Value – Measured value)/ True Value × 100%

Discussion

1.) Draw the graph of transducer characteristics(input vs. output).
2.) Draw the graph of (% error vs output voltage)
3.) Identify the sources of error in measurement.

Precautions