

Measurement of voltage using voltage transducer

Objective

To measure the voltage output using a voltage 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 input like resistance, inductance and other electrical quantities into a suitable output.

A voltage transducer is an element of electrical circuitry that both measures and monitors the levels of current and voltage dispersed and dispensed through the circuit, depending on whether the current is AC or DC. If the power supplied to the circuit is alternating current, or AC, the voltage transducer will monitor and measure the current more readily than the voltage, while voltage transducers work mainly in conjunction with DC power sources. Voltage transducers are passive transducers which use the external power for transduction from an auxiliary power source. If the input voltage is high, it is scaled down using a potential transformer to the input voltage level.

Here, Voltage transducer is used to convert AC voltage into 0 to 5 volt dc voltage. Ac voltage is applied in the input terminals (2 & 5) using autotransformer. A voltmeter is connected in parallel across the input terminals. Auxiliary supply is applied at terminal 13 & 14, digital multimeter is connected terminal 17 & 18, which measures output dc voltage.

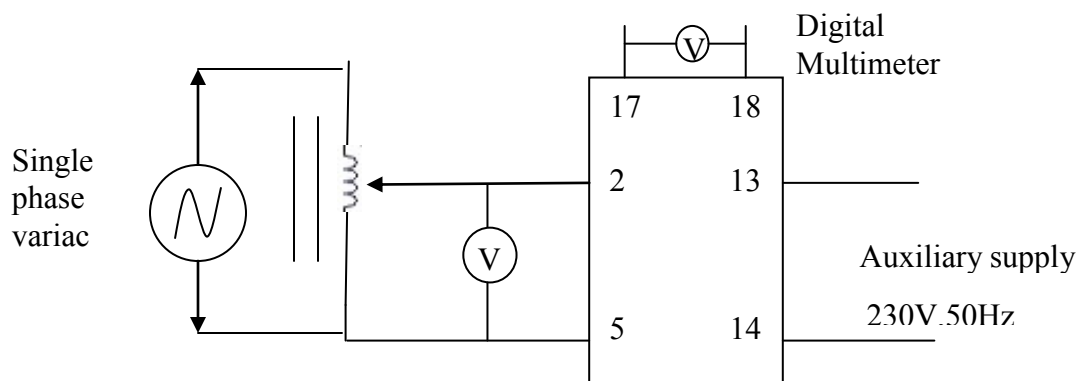


Figure: Connection diagram for voltage measurement using voltage transducer

Observation Table

Sl. No.	Input voltage (AC)	Transducer Output Voltage (DC)	Calibration Error

Calculation:

Calibration Error = (True Value – Measured value)/ True Value \times 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: