

EXPERIMENT NO. 8

Objective: To find the polarity and turns ratio of a single-phase transformer.

Apparatus Required:

Sr. No.	Apparatus	Quantity	Range/ Remark
1	Single phase AC supply	1	(.....) V
2	Variac (i/p-230V,o/p-0-270V,15A)	1	
3	AC Voltmeter	3	(.....)V, (.....) V, (.....)V
4	Single phase transformer	1	(2KVA ,i/p: 230-199-115V, o/p: 0-230V, Rated current 8.7A)
5	Connecting wires	--	--

Circuit Diagram:

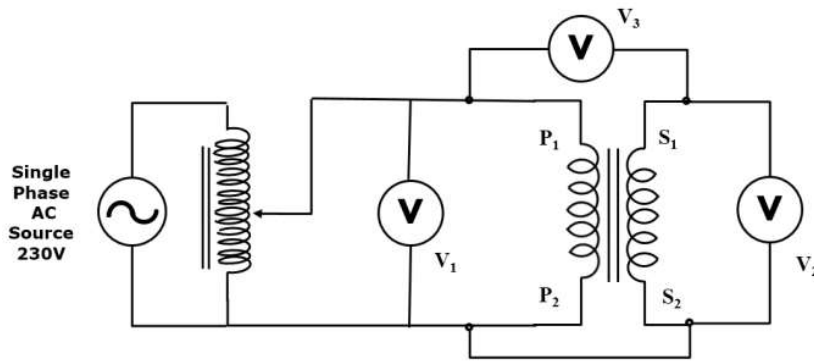


Fig 1 – Circuit Diagram for Single Phase Transformer

Observation Table:

S.N.	V ₁ (volts)	V ₂ (volt)	V ₃ = V ₁ - V ₂ or V ₃ = V ₁ + V ₂	Turns Ratio = $\frac{V_2}{V_1}$

Theory:

It is essential to know the relative polarity at any instant of primary and secondary terminal for making correct connection, when two transformers are to be connected in parallel to share the load on the system. When voltage $V_3 = V_1 - V_2$, such a polarity is termed as a additive polarity. The standard practice is to have additive polarity because it reduces the voltage stress between adjacent load.

In case $V_3 = V_1 + V_2$ the EMF induces in primary and secondary have a subtractive relation in transformer and is said to have subtractive polarity.

Procedure:

1. Connect the circuit as shown in the circuit diagram.
2. Switch On the AC supply.
3. Record the voltages V_1 , V_2 and V_3 of voltmeter
4. If $V_3 = V_1 - V_2$ then mark S_1 as a additive polarity or positive polarity
5. If $V_3 = V_1 + V_2$ then mark S_1 as a subtractive polarity or negative polarity.

Result:

The polarity of primary and secondary winding of single phase transformer has been marked and turns ratio found out.

Precaution:

1. Make the connections properly.
2. Note the readings of voltmeters properly avoid parallax
3. Avoid loose connections and don't touch wire with wet hand.
4. Before connecting all instruments check their zero reading.