

# TRANSFORMER WINDING RESISTANCE & ON-LOAD TAP CHANGER TEST SET



TWRM 10A

- Light weight and portable.
- Direct digital reading; no conversion scales required.
- True four-terminal measurement; no lead compensation required.
- Inductive voltage kickback suppressed by instrument protection.
- Suitable for energised switchyard condition.
- Operates even when one end of the winding is grounded.
- Two displays; The resistance of two windings can be shown simultaneously.
- Protected against current lead disconnection while in use.
- Stabilised output current; no adjustment required.
- Specifically designed to measure the resistance of highly inductive transformer winding very quickly and accurately.
- Ratiometric measurement allows accurate resistance determination at current level.
- Line power; No batteries required.
- Specifically designed to test power transformer with on load Tap changer.
- Open ground indication to protect the equipment with abnormal supply voltages.

## DESCRIPTION

The Eltel Transformer Winding Resistance Meter – Model TWRM-10A is designed to measure the winding resistance of highly inductive transformers quickly and accurately. The test set can measure the winding resistance of any transformer, single-or-three phase, delta or wye configured. Two independent displays allow the testing of any two windings simultaneously, saving time.

The winding resistance meter's wide resistance range gives optimum resolution even for the lowest winding resistance.

## APPLICATIONS

- Measurement of proper operation of On-load Tap Changer.
- Measurement of Transformer Winding Resistance.
- Measurement of Reactor Winding Resistance.
- Measurement of Generator & Motor Winding Resistance.
- Measurement of Power Cable Resistance.

## SPECIFICATIONS

Current Supply Principle	: Switch Mode Power Supply.
Input	: 230V $\pm$ 10%, 50Hz, 240VA.
Open Circuit Voltage	: 24V.
Test Current Ranges	: 0.01A, 0.1A, 1.0A, 10A continuous on all ranges.
Indication	: LED indication of current flow; output current displayed in percent on channel 1. Open ground indication.
Displays	: Two 4½ digit LCD displays showing 1999.9 at full scale. Reading rate is approximately one per second. Power 'ON' indication is provided.
Resistance Measurements Inputs	: Two isolated high impedance inputs, each with separate range controls and protection for inductive kickback.
Measurement Principle	: Electronic Thompson type circuit.
Accuracy	: $\pm$ 0.5% of rdg $\pm$ 5 counts at 10A, 1A and 0.1A ranges. $\pm$ 1.5% of rdg $\pm$ 5 counts at 10mA range. $\pm$ 2.5% of rdg. $\pm$ 5 counts for resistance values above 200 ohms.
Over range	: Indicated by all zeros.

## RANGES

Nominal (Ohms)	Resolution (Ohms)	Maximum Display (Ohms)
2 m	0.0001 m	1.9999 m
20 m	0.001 m	19.99 m
200 m	0.01 m	199.99 m
2	0.0001	1.9999
20	0.001	19.999
200	0.01	199.99
2000	0.1	1999.9

Current Range	Resistance max
10 A	2 $\Omega$
1 A	20 $\Omega$
0.1 A	200 $\Omega$
10 mA	2000 $\Omega$

## TAP CHANGER APPLICATION

The design features of TWRM-10A makes the instrument especially useful in checking the proper operation of ON-Load tap changers on Power Transformers. The instrument can be left ON while changing the tap. This allows the operator to take measurements very quickly without discharging, then re-charging the transformer for every tap. The Transformer Winding Resistance Meter will re-balance after every tap change. If the tap is defective or if there is even a fraction of time where the tap is open, the instrument will automatically go into discharge cycle. This gives the operator a clear indication of a proper make-before-break operation of the tap changer. During any OPEN condition, the transformer will not be damaged by the instrument's DC current.

## STANDARD ACCESSORIES

- Set of leads including:
    - Two sets of 15m Potential leads.
    - One set of 15m Current lead.
    - One 5m ground lead.
    - One 5m shorting lead
    - Battery clips supplied are with 45mm opening for current leads and potential leads.
  - AC Power cord.
  - Transport case.
  - Operational Manual (soft copy).
- Temperature : 0 to 50° C.  
Humidity : 0 to 90% non-condensing.  
Weight : Approximately 12 kgs.  
Dimensions : 450mm x 252mm x 250mm (LxHxB).



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