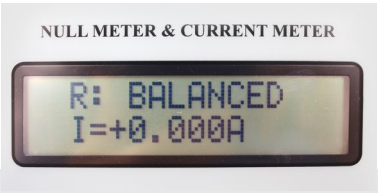
MAKE IN INDIA INITIATIVE
RECOGNISED WORLDWIDE

TRANSFORMER RATIO METER

TRM-100 PLUS

TRM-150 PLUS

TRM-200 PLUS



DESCRIPTION

The Ratio Meters are used to measure the no-load transformer ratio, i.e., ratio of high voltage winding to low voltage winding of a transformer in a bridge circuit and at low flux density in a core. Besides ratio, the Ratio Meter is used to measure percent deviation of ratio, phase angle deviation and excitation current. The instrument provides a selectable excitation voltage, either 120V AC or 12V AC which is isolated from the main supply. When balanced, the ratio of the transformer is read directly in numerical form from the dials on the front panel. The balancing procedure is simplified by an internal synchronous and phase sensitive detector, which can be made sensitive to either the ratio or the phase angle adjustments.

FEATURES

- Measure: Ratio, phase angle deviation, percent deviation, excitation current
- Numeric read out of Ratio
- High ratio upto 2021:1 for TRM-200 PLUS & TRM-100 PLUS/ 2022.21:1 for TRM-150 PLUS
- Two isolated test voltages,120V/ 12V
- True four terminal measurement
- Gain Control
- Three phase lead switching built-in (TRM-200 PLUS)
- Checks for correct polarity
- H & X Selector Switch for TRM-200 PLUS
- Resettable, fast acting MCB and fuse for input protection
- High accuracy
- Dot Matrix Display 16X2 with inbuilt Current Meter & Null Indicator for TRM-200 PLUS & 150 PLUS / Digital Null Indicator for TRM-100 PLUS
- Rugged dials for better appearance & grip

APPLICATIONS

- Power Transformers • Distribution Transformers
- CVT Range Extension 40:1

SPECIFICATIONS

Circuits	: Transformer-arm Bridge
Power	: 230V ±10%, 50 Hz, 20VA or 115 ±10%, 60 Hz
Test Voltage	: I20V and 12V AC at 1A isolated
Ratio Range	: 0.8:1 to 2021:1for TRM-200 PLUS & TRM-100 PLUS 0.8:1 to 2022.21:1 for TRM-150 PLUS
Ratio Resolution	: 0.01% for TRM-200 PLUS & TRM-100 PLUS / 0.0013% for TRM-150 PLUS
Matrix display	: 16x2 for Null Indicator & Current Indicator
Accuracy	: Better than ±0.1% of ratio at 120V test voltage
Deviation Dials	: Ratio deviation ±0.55% of ratio with a resolution of 0.02; Phase Angle Deviation: 2 ranges of ±0.55 CR and ±5.5 CR
Dimensions	: Approx. 450mm x 230mm x 200mm (LxBxH)
Weight	: Approx.15 kgs

Amphenol MIL Standard connectors are provided for output connection.

The Ratio meters are supplied with AC Power cord, operation manual and spare fuses.

Cables : Set of 10 meter cable; Set of 15 meter cable

(optional 10 meter extension cable to extend the length to 25 meters can be supplied).

PHASE ANGLE DEVIATION: ELTEL are the pioneers in manufacturing Ratio Meters which facilitates balancing of phase angle deviation. The phase angle difference between primary and secondary voltage gives clues to whether the power transformer under test has shorted turns or whether the windings has an unequal number of turns connected in parallel. All these factors change the phase angle between primary & secondary voltage. The phase angle deviation is also important in evaluating CTs for shorted turns.

TEST VOLTAGES: There are two isolated test voltages, 120V/12V which enable testing of both power transformers (120V) and voltage transformers. Large CTs can also be tested provided the CTs do not get saturated at 12V / 120V.

TRUE 4 TERMINAL MEASUREMENT: The leads that are supplied allow for a true four terminal measurement which eliminates errors caused by lead length and errors due to circulating currents.

PHASE SENSITIVE NULL DETECTOR: The electronic synchronous and phase sensitive null detector with a 100:1 gain control permits fast and precise balance with the capability of discerning 1 turn in 2000.

LEAD SWITCHING: The TRM-200 PLUS has a built-in three phase switching Rotary switch to assist the operator and eliminate the time consuming task of climbing to the top of power transformers to change the leads. Measurement continues to be performed in single phase method and the front panel Rotary Switch allows the selection of any phase combination. Various vector group combinations can be measured. In certain cases a jumper needs to be applied and a multiplication factor is needed to arrive at the final Ratio. (Detailed chart provided in the Operation Manual)

POLARITY CHECK: The polarity indicator comes 'ON' when the connections between the instrument and the transformer under test are not properly made or the phase angle difference between the primary and the secondary of the transformer is greater than 10 degrees. There is a polarity reversal switch marked "REV" with a LED indication provided. When the LED glows the switch position has to be changed before balancing.

FULLY PROTECTED: It frequently happens that the Ratio Meter is connected to the transformer incorrectly stepping up the test voltage instead of stepping down. The input terminals have high speed electronic protection which shorts out the input and causes the fast acting resettable MCB to trip and turn off the instrument.

REPLACEABLE PCB: All electronics is focused on to a single plug-in-type PCB which is easily field replaceable.

POWERLINE FILTERS: This is provided at the power input to reduce effect of RF interference.

EXCITATION CURRENT: There is a built-in Digital milliammeter to measure excitation current for TRM-200 PLUS & TRM-150 PLUS. This will help in detecting a shorted turn on a parallel winding of power transformer if readings from previous measurements are available.

RESOLUTION: 0.01% for TRM-200 PLUS & TRM-100 PLUS
0.0013% for TRM-150 PLUS

OPTIONAL ACCESSORIES

- Spare PCB
- Range Extension 5:1

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Eltel Industries, established in 1983, is a market leader in the development and manufacturing of test instruments for electrical power industries and utilities.

Eltel Industries – Calibration Laboratory (including on-site calibrations) is NABL-ACCREDITED in electro-technical discipline in accordance to ISO/ IEC:17025/2017.