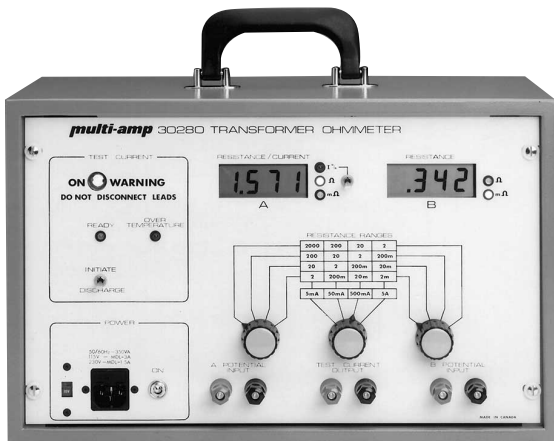


Transformer Ohmmeter

Transformer Winding Resistance and Tap-Changer Test Set



- **Direct digital reading**
- **Built-in discharge circuitry**
- **Two independent measuring channels**
- **Tests operation of on-load tap-changers**

DESCRIPTION

The Transformer Ohmmeter is a line-operated, field-portable instrument designed specifically to measure the dc resistance of all types of magnetic windings safely and accurately.

Its predominant use is the measurement of the dc resistance of all types of transformer windings within the defined ranges of current and resistance.

It can also test rotating machine windings and perform low-current resistance measurements on connections, contacts and control circuits.

Three features combine to make this instrument unique: dual measurement, load tap-changer testing and safety shutdown.

The dual set of potential inputs measure the resistance of the primary and secondary windings of a single- or three-phase transformer simultaneously. The dual reading characteristic will speed up the measurement when it is used to test windings on delta-delta connected windings on three-phase transformers.

Due to circulating currents induced when the test current is applied to the primary winding, this type of measurement is countered by the same current on the secondary winding. This action attenuates the circulating current and the reading time is improved tenfold.

The Transformer Ohmmeter is extremely useful when testing the windings and contact resistance on tap-changers with make-before-break contacts and voltage regulators.

The internal shutdown circuit will be triggered by a voltage kickback of a few microseconds if the tap-changer contacts are opened when the tap-changer circuit is operated through all of the tap positions.

This action will check for pitted or misaligned contacts as the instrument will shut down if either condition occurs.

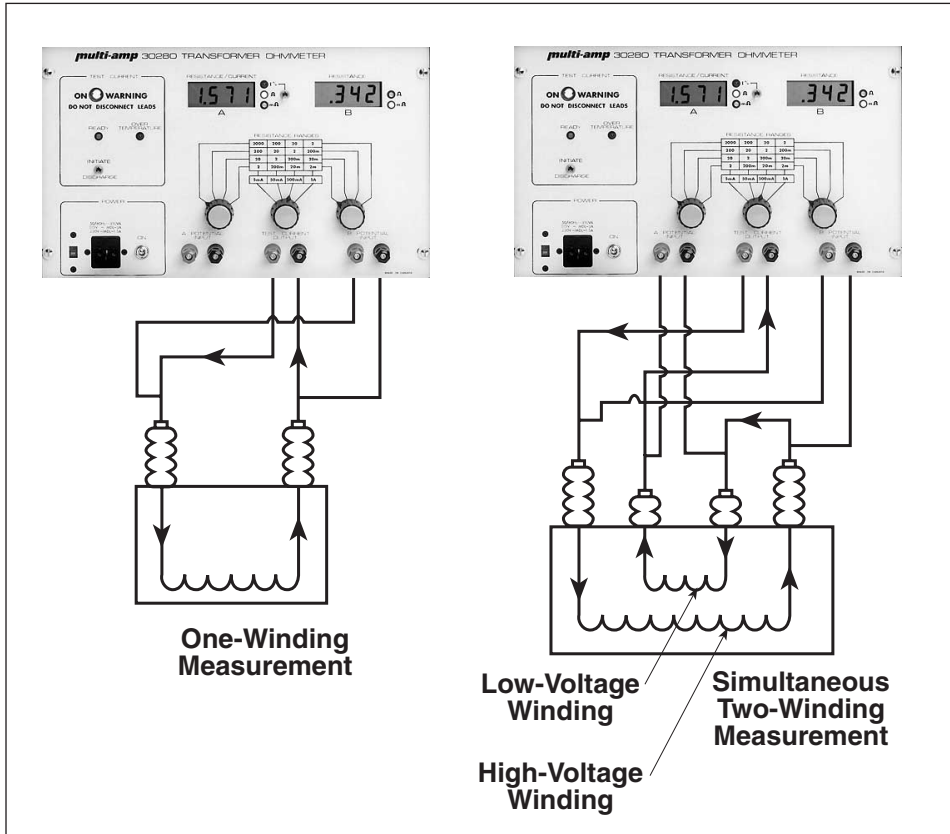
Users are protected by the shutdown circuit safety feature: any inadvertent disconnection of a test lead or loss of power to the instrument will safely discharge the energy stored in the test sample.

APPLICATIONS

The Transformer Ohmmeter is used:

- To verify factory test readings
- As part of a regular maintenance program
- To help locate the presence of defects in transformers, such as loose connections
- To check the make-before-break operation of on-load tap-changers

A regular maintenance program that includes winding resistance measurements is the most effective way to use this instrument. Once a benchmark is established, subsequent test results can be compared to determine if changes are occurring in the transformers, instrument transformers and associated control wiring, voltage regulators, motors, generators, breaker contacts, all types of connections (bolted, soldered, crimped, etc.).



Schematic comparison of one- and two-winding measurements

Tap-changers are mechanical devices and the most vulnerable part of a transformer. Tap-changers result in more failures and outages than any other component and so require frequent testing and attention to ensure proper, reliable operation.

The Transformer Ohmmeter can be used to check the make-before-break operation of on-load tap-changers and also to measure the contact resistance of each tap position.

FEATURES AND BENEFITS

- Direct digital reading saves time, no balancing is required.
- Built-in discharge circuit safely discharges the specimen when test is completed, if lead accidentally disconnects or if power is lost.
- Electromechanical safety indicator gives a visual indication of a charged or discharged specimen, even if power to the instrument is lost.
- Two independent measuring channels allow simultaneous testing of primary and secondary windings or measurement of two phases at a time.
- The sensitive surge detection circuitry monitors the contact operation of on-load tap-changers for the proper make-before-break sequence. If an open circuit condition exists, the instrument shuts down immediately.
- High-accuracy, four-terminal bridge: no lead compensation required.
- Electronically generated and regulated current supply overcomes high-inductance transformers quickly, allowing fast measurements to be taken. Display of measurement occurs only after test current stabilizes.
- Wide resistance range allows heat-run testing of many transformer types.
- Lightweight and portable, the Transformer Ohmmeter is ideal for use in shop or substation environments.
- Overtemperature protection provides automatic current shutdown and LED indication to prevent instrument damage.
- Instrument and accessories come in a foam-lined transport case.

SPECIFICATIONS

Measuring Principle

Electronic Thompson-type circuit

Input

120/240 V, 50/60 Hz, 350 VA

Output

Current Ranges: 5 mA, 50 mA, 500 mA, 5 A (dc)

Open-Circuit Test Voltage: 30 Vdc

Rating: Continuous use on all ranges

Resistance Measurement Inputs

Two isolated high-impedance inputs, each with separate range control and protection provided for flashover caused by inductive kickback

Nominal (ohms)	Resolution (ohms)	Maximum Display (ohms)
2 m	0.001 m	1.999 m
20 m	0.01 m	19.99 m
200 m	0.1 m	199.9 m
2	0.001	1.999
20	0.01	19.99
200	0.1	199.9
2000	1.0	1999

Ranges

Accuracy: ±0.5% reading, ±0.5% full scale (when current has stabilized)

Overrange: Lead number one displayed with all other digits blanked

Environmental

Operating: 32 to 104° F (0 to 40° C), relative humidity to 80%

Storage: -40 to +150° F (-40 to +65° C)

Temperature Coefficients: ±0.05% of applicable accuracy specifications per degree Celsius of resistance range

Displays

Two high-temperature, 0.7 in. (18 mm), liquid-crystal, 3½-digit displays showing 1999 at full scale. Update rate is approximately three times per second.

Dimensions

Instrument

11 H x 16 W x 10.5 D in. (280 H x 406 W x 267 D mm)

Transport Case

13 H x 20 W x 21 D in. (330 H x 508 W x 533 D mm)

Weight

Instrument: Net 40 lb (18 kg)

Shipping: 66 lb (30 kg)

ORDERING INFORMATION

Item (Qty) Cat. No.

Transformer Ohmmeter	
120 volt, 50/60 Hz input	830280
240 volt, 50/60 Hz input	830280-47

Included Accessories

Lead set, including	830282
Potential leads, 33 ft (10 m) [2 pr]	
Current leads, 33 ft (10 m) [1 pr]	
Shorting lead, 9.9 ft (3 m) [1]	
Universal bushing adapters [set of 4]	830285
AC power cord	17032
Transport case	MC996
Instruction manual	AVTM830280

Optional Accessories

Lead set, including	830282-66
Potential leads, 66 ft (20m) [2pr]	
Current leads, 66 ft (20 m) [2 pr]	
Shorting lead, 9.9 ft (3 m) [1]	