

WRM-40

Winding Resistance Meter



Vanguard Instruments Company

H.V. TEST (PTY) LTD

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WRM-40™

Fast and Accurate Measurements

The WRM-40 accurately measures winding resistance of highly inductive power transformers. Dual resistance-reading-input channels allow the measurement of two winding resistances simultaneously. Four-wire (Kelvin) connections provide high accuracy and require no lead compensation. Utilizing a 36Vdc power supply capable of outputting up to 40 amperes; the WRM-40 provides stable resistance readings of very large transformers. The resistance reading of a 500MVA transformer can be achieved in 3 minutes or less. The WRM-40 power supply is cooled by four heavy duty fans designed for continuous operation.

Since the WRM-40 can accurately measure resistances ranging from 1 micro-ohm to 500 ohms, it can also be used to measure EHV circuit-breaker contact resistance, motor winding resistance, and other low resistance test application. The transformer winding temperature can be input to the WRM-40, which will calculate the equivalent resistance value of the (aluminum or copper) winding at any standard reference temperature. A special test mode allows the WRM-40 to run a test up to 45 minutes while saving resistance readings at one-minute intervals. A contact mode checks the "make-before-break" tap-switching sequences of voltage regulators and load tap changers.

The WRM-40 can store test results in FLASH EEPROM for later recall, analysis, or printout. The test results may be downloaded to a computer database for archival and statistic purposes. A built-in 2.5-in thermal printer permits users to print out hard copies of test results in the field. The WRM-40 is supplied with three 50-foot cable sets. Each cable lead is terminated with a "quick-disconnect" test clip.

Built-in Safety Features

To ensure the operator's safety, the WRM-40 automatically dissipates the energy stored in the transformer at the end of each test. This discharge circuit will continue to work even in if the WRM-40 supply voltage is lost.

User Interface

A rugged, 16-button alpha-numeric key pad allows the users to enter test information and to select control functions. Current and resistance readings display on a 4-line by 20-character back lighted LCD.

Test Result Storage Capacity

The WRM-40 can store 48 records (up to 96 readings per record) in the FLASH EEPROM memory. User can recall stored records for printing or transfer to an IBM-compatible PC via the RS-232C port. A Windows based software package (provided) with each unit allows the users to download test records to a PC. The user can then review, print or export test records.

SPECIFICATIONS

TYPE	Special purpose test equipment, portable transformer winding resistance meter
PHYSICAL SPECIFICATIONS	25" W by 8.5" H by 20" D (63.5 cm x 21.6 cm x 50 cm), Weight 44 lbs (20 kg)
INPUT POWER	90-130 Vac or 200-240 Vac (selectable), 50/60 Hz
RESISTANCE READING RANGE	1 micro-ohm to 500 ohms
ACCURACY	1-19,999 micro-ohm: ±0.5% reading, ±1 count; 20-999 milli-ohm: ±1% reading, ±1 count; 1-500 ohm: ±1.5% reading, ±1 count
TEST VOLTAGE	36 Vdc max
TEST CURRENT RANGE	Auto range, 40 Amperes max
DISPLAY	Backlit LCD, 4 lines by 20 characters
PRINTER	2.5" wide Thermal Printer
KEYBOARD	Heavy-duty keypad: 10 number keys, 6 function keys
TEST RECORD STORAGE	Store 63 records of 96 readings each
COMPUTER INTERFACE	RS-232C port, 19,200 Baud
PC SOFTWARE	Windows® 98/2000/NT/XP-Based software included
SAFETY	Designed to meet IEC61010 (1995), UL61010A-1, CSA-C22.2
ENVIRONMENT	Operating: -10°C to 50° C (15°F to +122° F); Storage: -30° C to 70° C (-22°F to +158° F)
CABLES	Three 50-ft test cables, ground cable, power cord and cable bag
OPTIONS	Shipping Case
WARRANTY	One Year Parts & Labor, Post Warranty Service Contract Available

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TEST RESULTS

DATE: 01/22/05 TIME: 06:43:40

COMPANY: VIC
 STATION: WSH
 CIRCUIT: BNK5
 MFR: EFACEC
 MODEL: C13968
 S/N: C13968
 KVA RATING: 138 13
 OPERATOR: AG

EQUIVALENT RESISTANCE DATA
 MEAS TEMP $T_m = 16.5C$ 61.7F
 REF TEMP $T_s = 85.0C$ 185.0F
 COPPER WINDINGS, $T_k = 234.5C$

$R_s = R_{meas} \times [(T_s + T_k) / (T_m + T_k)]$
 All temps for eqn are in deg C

V1 & V2 TEST

R1 = 502 MICRO-OHMS
 R1s = 639 MICRO-OHMS

R2 = 506 MICRO-OHMS
 R2s = 644 MICRO-OHMS

TAP/WINDING: _____

DATE: 01/22/05 TIME: 06:43:40

▲ Thermal Printer Output



Ordering Information

WRM-40™ Winding Resistance Meter

WRM-40™, Cable, Software

Part No: WRM-40

WRM-40™ Shipping Case

Part No: WRM-40 Case

50-ft Test Cable

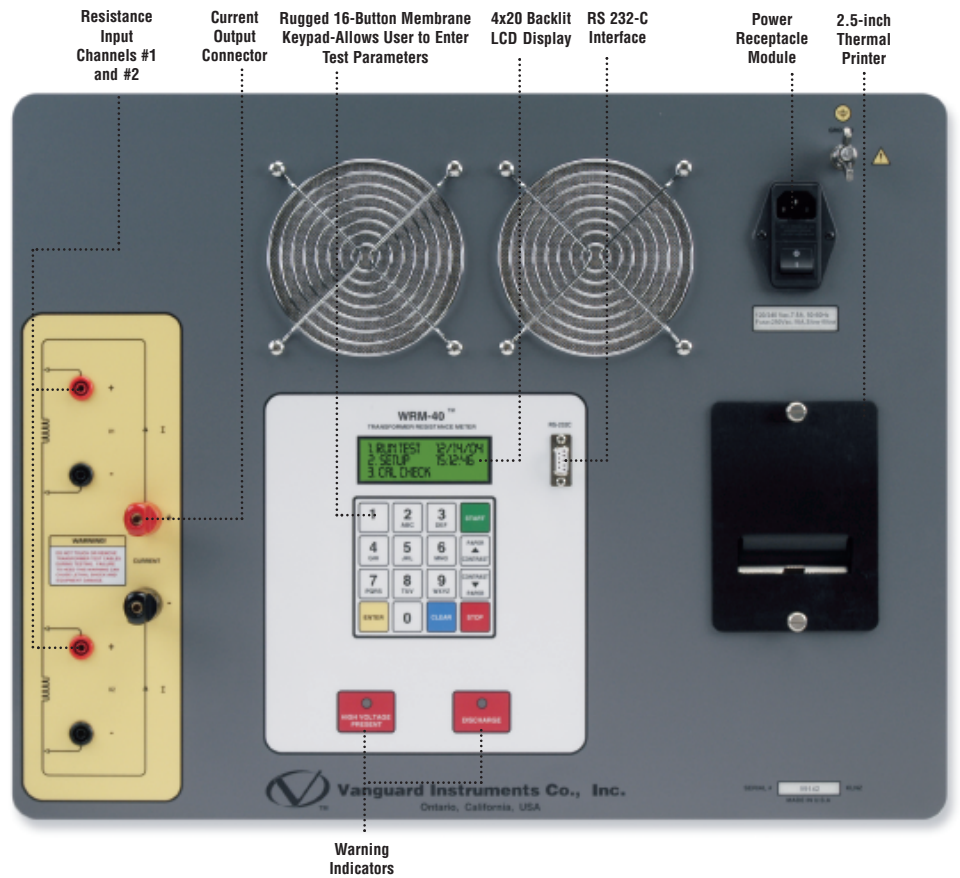
Part No: WRM Test Cable

2.5-inch Printer Paper

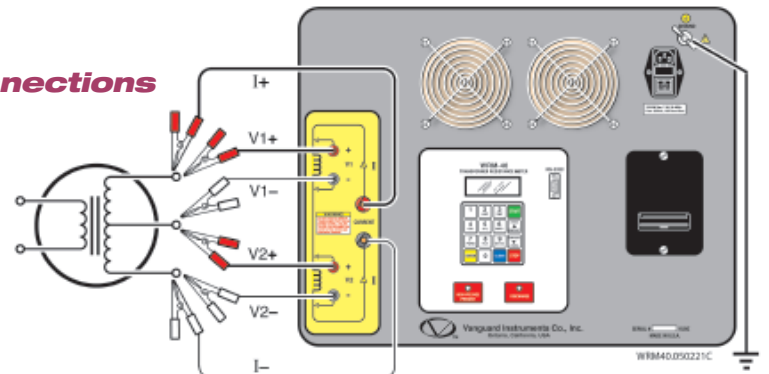
Part No: Paper TP3

FEATURES

- AUTO DISCHARGE CIRCUIT FOR OPERATOR SAFETY
- AUTO CURRENT RANGING FROM 10 mA TO 40 AMPERES
- DIGITAL RESISTANCE READING FROM 1 MICRO-OHM TO 500 OHMS
- STORES 63 RECORDS (OF 96 READINGS EACH)
- BUILT-IN 2.5-INCH THERMAL PRINTER • WEIGHT IS LESS THAN 44 LBS



Connections



Note: The above specifications are valid at nominal voltage and ambient temperature of +25°C (+77°F). Specifications are subject to change without notice.

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