


Fast and Accurate Measurements



# QRM-10P

amperis

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# QRM-10P

The QRM-10P is designed to accurately measure the winding resistance of highly inductive power transformers. The unit's dual resistance-reading input channels can measure two winding resistances simultaneously, and four-wire (Kelvin) connections provide high accuracy and require no lead compensation. The QRM-10P provides stable resistance readings of very large transformers by utilizing a 36Vdc power supply capable of outputting up to 10 Amperes. The resistance reading of a 100MVA transformer can be achieved in 5 minutes or less. The unit's power supply is cooled by heavy-duty fans designed for continuous operation. For greater flexibility in the field, the QRM-10P comes with a built-in 2.5-inch wide thermal printer used for printing test reports.

## Accurately

Since the QRM-10P can accurately measure resistances ranging from 1 micro-ohm to 2,000 ohms, it can also be used to measure EHV circuit-breaker contact resistance, motor winding resistance, or any low resistance. If the transformer winding temperature is entered, the QRM-10P can calculate the equivalent resistance value of the winding material (aluminum or copper) at any standard reference temperature. Also, a special test mode can run a test for up to 45 minutes while saving resistance readings at one-minute intervals. In addition to measuring the resistance value, the QRM-10P also checks the "make-before-break" tap-switching sequences of voltage regulators and load tap changers.

The QRM-10P can store test results in Flash EEPROM. Test results can be printed on the built-in 2.5-inch wide thermal printer or can be transferred to a PC via the RS-232C interface port.

The QRM-10P is furnished with three 50-foot test cables. Each test cable lead is terminated with a quick-disconnect test clip.

## Built-in Safety Features

At the end of each test, the QRM-10P automatically dissipates the stored energy in the transformer. This discharge circuit will continue to work even if the supply voltage is lost.

For added safety, the unit's power supply is thermally protected from overload damage.

## Internal Test Record Storage

The QRM-10P can store 63 test records (up to 48 readings per test record) in Flash EEPROM. Test records can be retrieved and printed on the built-in thermal printer or can be transferred to a PC via the RS-232C interface port. A Windows® XP/Vista-based software application is provided with each QRM-10P. This software can be used to retrieve test records from the QRM-10P and can also be used to export records in Microsoft® Excel format.

## User Interface

The QRM-10P features a back-lit LCD screen (20 characters by 4 lines) that is viewable in both bright sunlight and low-light levels. A rugged, alpha-numeric, membrane keypad is used to control the unit.



## SPECIFICATIONS

TYPE	Portable transformer winding resistance meter
PHYSICAL SPECIFICATIONS	16.8"W x 12.6"H x 10.6"D (42.6 cm x 32.0 cm x 26.9 cm); Weight: 27 lbs (12.2 kg)
INPUT POWER	100 – 120 Vac or 200 – 240 Vac (factory pre-set), 50/60 Hz
RESISTANCE READING RANGE	1 micro-ohm – 2,000 ohms
ACCURACY	1 – 19,999 micro-ohms: $\pm 0.5\%$ reading, $\pm 1$ count; 20 – 999 milli-ohms: $\pm 1\%$ reading, $\pm 1$ count; 1 – 2,000 ohms: $\pm 1.5\%$ reading, $\pm 1$ count
TEST VOLTAGE	36 Vdc max
TEST CURRENT RANGE	Auto range, 10 Amperes max
DISPLAY	Back-lit LCD Screen (20 characters by 4 lines); viewable in bright sunlight and low-light levels
PRINTER	2.5-inch wide built-in thermal printer
KEYPAD	Rugged membrane keypad (10 alpha-numeric keys, 6 function keys)
INTERNAL TEST RECORD STORAGE	Stores 63 test records of 48 readings each
COMPUTER INTERFACE	One RS-232C (19,200 Baud) port
PC SOFTWARE	Windows® XP/Vista-based software is included with purchase price
SAFETY	Designed to meet IEC61010 (1995), UL61010A-1, CSA-C22.2 standards
ENVIRONMENT	Operating: -10°C to 50° C (15°F to +122° F); Storage: -30° C to 70° C (-22°F to +158° F)
HUMIDITY	90% RH @ 40°C (104°F) non-condensing
ALTITUDE	2,000m (6,562 ft) to full safety specifications
CABLES	Three 50-foot test cables, ground cable, power cord and cable bag
OPTIONS	Transportation case
WARRANTY	One year on parts and labor

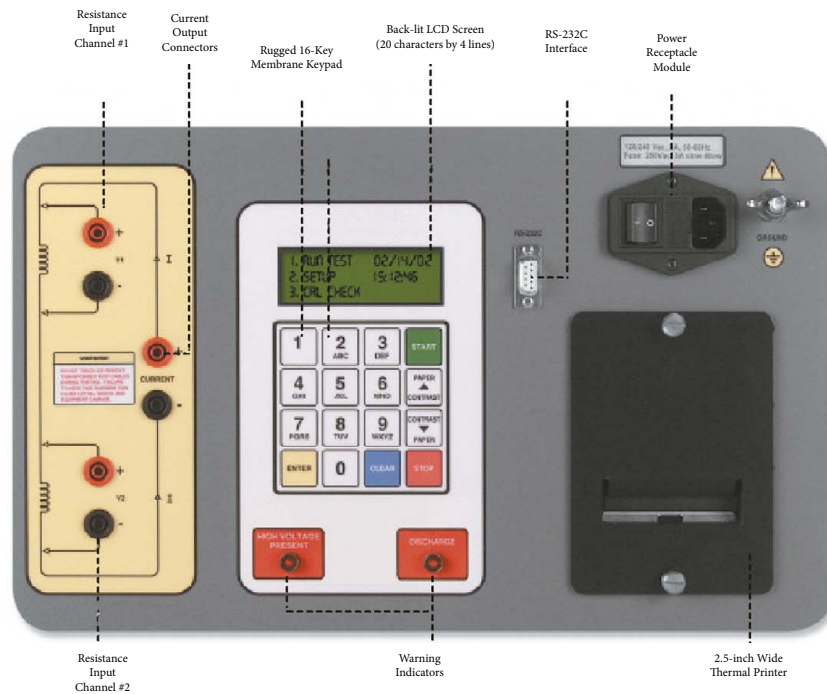
# Lightweight Winding Resistance Meter

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

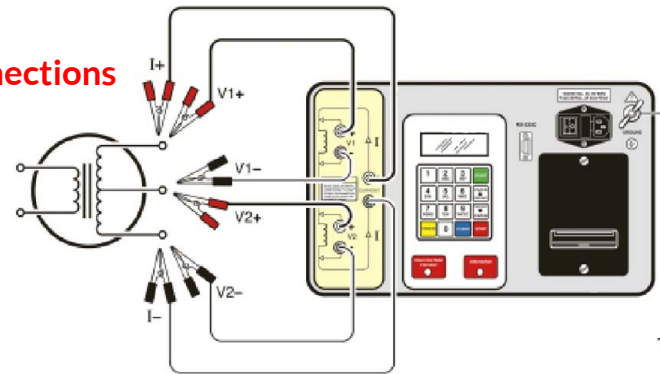
# Measure Winding Resistances of Highly Inductive Power Transformers

## FEATURES

- Auto discharge circuit for operator safety
- Auto current ranging from 10 mA to 10 Amperes
- Digital resistance reading from 1 micro-ohm to 2,000 Ohms
- Calculates equivalent resistance value at reference temperature
- Stores 63 records (of 48 readings each)
- Built-in 2.5-inch wide thermal printer
- Weighs 27 lbs (12.2 Kg)



## Connections



## Ordering Information QRM-10PTM Winding Resistance Meter

QRM-10PTM, Cable, Software  
Part No: QRM-10P  
QRM-10PTM Shipping Case  
Part No: QRM-10P Case  
50-ft Test Cable  
Part No: WRM Test Cable  
2.5-inch Printer Paper  
Part No: Paper TP3

## Thermal Printer Output

REC NUMBER 3	
TEST RESULTS	
DATE: 01/21/05	TIME: 14:55:09
COMPANY: NPC	STATION: USH
CIRCUIT: BNKS	MFR: EFACBC
MODEL: C13968	S/N: C13968
KVA RATING: 138 13	OPERATOR: AG
EQUIVALENT RESISTANCE DATA MEAS TEMP $T_m = 20.50$ 68.9F REF TEMP $T_s = 85.00$ 185.0F COPPER WINDINGS, $T_k = 234.50$	
$R_s = R_{meas} \times \frac{C(T_s + T_k)}{C(T_m + T_k)}$ All temps for eqn are in deg C	
V1 & V2 TEST	
R1 = 60.393 MILLI-OHMS	R1s = 75.67 MILLI-OHMS
R2 = 60.377 MILLI-OHMS	R2s = 75.65 MILLI-OHMS
TAP/WINDING: _____	
V1 & V2 TEST	
R1 = 60.430 MILLI-OHMS	R1s = 75.71 MILLI-OHMS
R2 = 60.395 MILLI-OHMS	R2s = 75.67 MILLI-OHMS
TAP/WINDING: _____	