

# WRM-10P

*lightweight winding resistance meter*



**Vanguard Instruments Company, Inc.**  
[www.vanguard-instruments.com](http://www.vanguard-instruments.com)

# WRM-10P

## lightweight winding resistance meter

The WRM-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 WRM-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 WRM-10P comes with a built-in 2.5-inch wide thermal printer used for printing test reports.



Since the WRM-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 WRM-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 WRM-10P also checks the "make-before-break" tap-switching sequences of voltage regulators and load tap changers.

The WRM-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 WRM-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 WRM-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 over-load damage.

### Internal Test Record Storage

The WRM-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. Windows®-based software is provided with each WRM-10P that can be used to retrieve test records from the WRM-10P and can also be used to export records in Microsoft® Excel format.

### User Interface

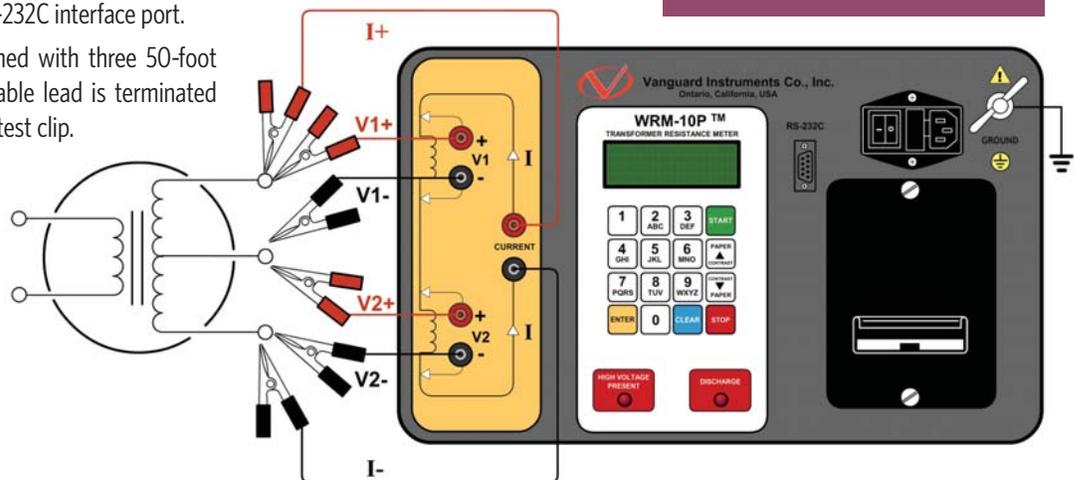
The WRM-10P features a back-lit LCD screen (20 characters by 4 lines) that is viewable in both bright sunlight and low-light levels. A rugged, alpha-numeric, membrane keypad is used to control the unit.

### Built-in Thermal Printer

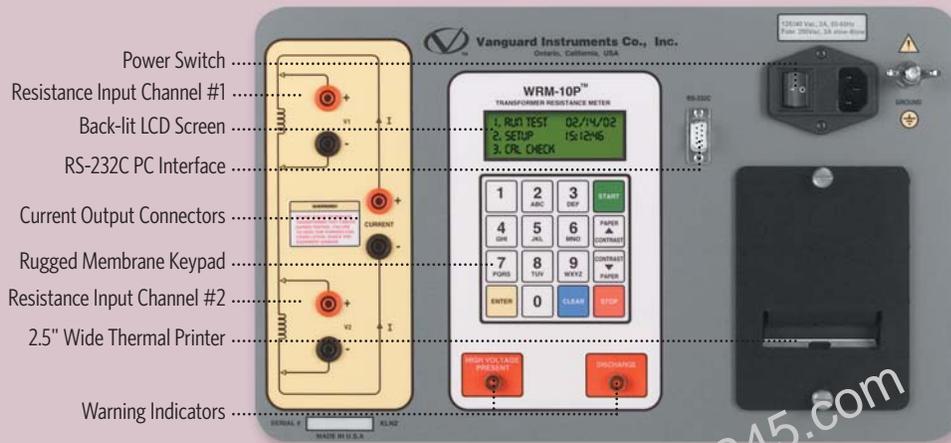
The WRM-10P features a built-in 2.5" wide thermal printer that can be used to print test reports in the field.

### outstanding features

- Auto discharge circuit for operator safety
- Auto current ranging from 10 mA to 10 A
- Digital resistance reading from 1 micro-ohm to 2,000 ohms
- Stores 63 records (of 48 readings each)
- Built-in 2.5-inch wide thermal printer



# WRM-10P Controls & Indicators



## Thermal Printer Output

TEST RESULTS	
DATE: 01/19/12	TIME: 12:19:38
COMPANY:	
STATION:	
CIRCUIT:	
MFR:	
MODEL:	
S/N:	
KVA RATING:	
OPERATOR:	
EQUIVALENT RESISTANCE DATA	
MEAS TEMP	T <sub>m</sub> = 25.0C 77.0F
REF TEMP	T <sub>s</sub> = 85.0C 185.0F
COPPER WINDINGS, T <sub>k</sub> = 234.5C	
R <sub>s</sub> = R <sub>meas</sub> × [(T <sub>s</sub> +T <sub>k</sub> )/(T <sub>m</sub> +T <sub>k</sub> )]	
All temps for eqn are in deg C	
V1 & V2 TEST	
R1	= 60.499 MILLI-OHMS
R1s	= 74.49 MILLI-OHMS
R2	= 60.570 MILLI-OHMS
R2s	= 74.57 MILLI-OHMS
TAP/WINDING:	
DATE: 01/19/12	TIME: 12:19:38

## WRM-10P specifications

<b>type</b>	portable transformer winding resistance meter
<b>physical specifications</b>	17"W x 12½"H x 10½"D, (42.6 cm x 32.0 cm x 27.0 cm); Weight: 27 lbs (12.2 kg)
<b>input power</b>	100 – 120 Vac or 200 – 240 Vac (factory pre-set), 50/60 Hz
<b>resistance reading range</b>	1 micro-ohm – 2,000 ohms
<b>accuracy</b>	1 – 19,999 micro-ohms: ±0.5% reading, ±1 count; 20 – 999 milli-ohms: ±1% reading, ±1 count; 1 – 2,000 ohms: ±1.5% reading, ±1 count
<b>test voltage</b>	36 Vdc max
<b>test current range</b>	auto range, 10 Amperes max
<b>display</b>	back-lit LCD Screen (20 characters by 4 lines); viewable in bright sunlight and low-light levels
<b>printer</b>	2.5-inch wide built-in thermal printer
<b>keypad</b>	rugged membrane keypad (10 alpha-numeric keys, 6 function keys)
<b>internal test record storage</b>	stores 63 test records of 48 readings each
<b>computer interface</b>	one RS-232C port
<b>pc software</b>	Windows®-based software is included with purchase price
<b>safety</b>	designed to meet IEC61010 (1995), UL61010A-1, CSA-C22.2 standards
<b>environment</b>	Operating: -10°C to +50°C (+15°F to +122°F); Storage: -30°C to +70°C (-22°F to +158°F)
<b>humidity</b>	90% RH @ 40°C (104°F) non-condensing
<b>altitude</b>	2,000 m (6,562 ft) to full safety specifications
<b>cables</b>	three 50-foot test cables, ground cable, power cord and cable bag
<b>options</b>	transportation case
<b>warranty</b>	one year on parts and labor

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

## ordering information

Part number <b>WRM-10P</b>	WRM-10P and cables
Part number <b>WRM-10P CASE</b>	WRM-10P shipping case
Part number <b>WRM-10P 50-FT CABLES</b>	50-foot test cables
Part number <b>TP3</b>	2.5-inch wide thermal printer paper



Instruments designed and developed  
by the hearts and minds of utility  
electricians around the world

Vanguard Instruments Company, (VIC), was founded in 1991. Currently, our 28,000 square-foot facility houses Administration, Design & Engineering, and Manufacturing operations. From its inception, VIC's vision was, and is to develop and manufacture innovative test equipment for use in testing substation EHV circuit breakers and other electrical apparatus.

The first VIC product was a computerized circuitbreaker analyzer, which was a resounding success. It became the forerunner of an entire series of circuitbreaker test equipment. Since its beginning, VIC's product line has expanded to include microcomputer-based, precision micro-ohmmeters, single and three phase transformer winding turns-ratio testers, transformer winding-resistance meters, mega-ohm resistance meters, and a variety of other electrical utility maintenance support products.

VIC's performance-oriented products are well suited for the utility industry. They are rugged, reliable, accurate, user friendly, and most are computer controlled. Computer control, with innovative programming, provides many automated testing functions. VIC's instruments eliminate tedious and time-consuming operations, while providing fast, complex, test-result calculations. Errors are reduced and the need to memorize long sequences of procedural steps is eliminated. Every VIC instrument is competitively priced and is covered by a liberal warranty.



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