

# WRM-10P S2

lightweight winding resistance meter



Vanguard Instruments  
A DOBLE COMPANY





# WRM-10P S2

## lightweight winding resistance meter

### Product Overview

Since the WRM-10P S2 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 S2 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 60 minutes while saving resistance readings at 10, 15, 20, 30, or 60 second intervals. In addition to measuring the resistance value, the WRM-10P S2 also checks the "make-before-break" tap-switching sequences of voltage regulators and load tap changers.

The WRM-10P S2 can store test results in Flash EEPROM. Test results can be printed on the built-in 2.5" wide thermal printer or can be transferred to a PC via the USB PC or USB Flash drive interfaces.

The WRM-10P S2 is furnished with three 50-foot test cables. Each test cable lead is terminated with a quick-disconnect test clip.

The WRM-10P S2 is Vanguard's second generation lightweight winding resistance meter 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 S2 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 S2 comes with a built-in 2.5" wide thermal printer used for printing test reports.

### Built-in Safety Features

At the end of each test, the WRM-10P S2 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.

### User Interface

The WRM-10P S2 features a 5" back-lit LCD screen (240 x 128 pixels) that is viewable in bright sunlight and low-light levels. A rugged, "QWERTY"-style, membrane keyboard is used to control the unit.

### Internal Test Record Storage

The WRM-10P S2 can store 100 test records (up to 64 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 USB PC or USB Flash drive interfaces. Windows®-based software is provided with each WRM-10P S2 that can be used to retrieve test records from the unit and can also be used to export records in Microsoft® Excel format.

### Built-in Thermal Printer

The WRM-10P S2 features a built-in 2.5" wide thermal printer that can be used to print test reports in the field.

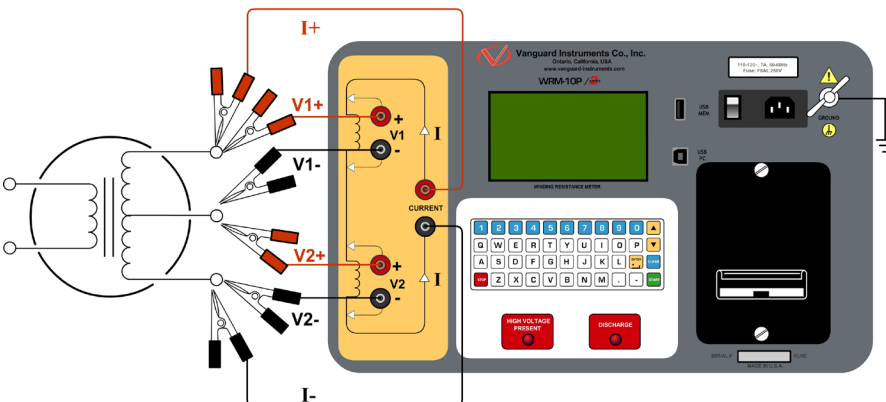
### outstanding features

- 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 100 records (up to 64 readings each)
- Built-in 2.5" wide thermal printer

### ordering information

Part No.	Description
9137-UC	110V WRM-10P S2 and cables
9138-UC	220V WRM-10P S2 and cables
9137-SC	WRM-10P S2 shipping case
TP3-CS	TP3 thermal printer paper (36 rolls)

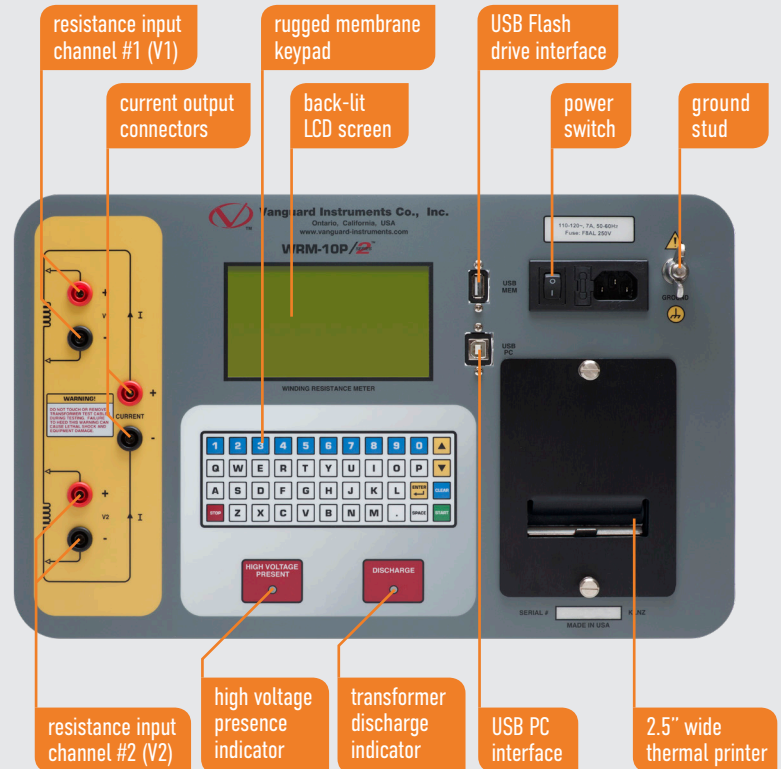
### WRM-10P test connections






















## Thermal Printer Output

TEST RESULTS	
DATE: 01/19/17	TIME: 12:19:38
COMPANY: STATION: CIRCUIT: MFR: MODEL: S/N: KVA RATING: OPERATOR:	
EQUIVALENT RESISTANCE DATA MEAS TEMP $T_m = 25.0C$ 77.0F 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 = 60.499 MILLI-OHMS	..... Winding resistance at 25°C
R1s = 74.49 MILLI-OHMS	..... Equivalent resistance value at 85°C
R2 = 60.570 MILLI-OHMS	
R2s = 74.57 MILLI-OHMS	
TAP/WINDING: _____	
DATE: 01/19/17	TIME: 12:19:38

## WRM-10P S2 Features

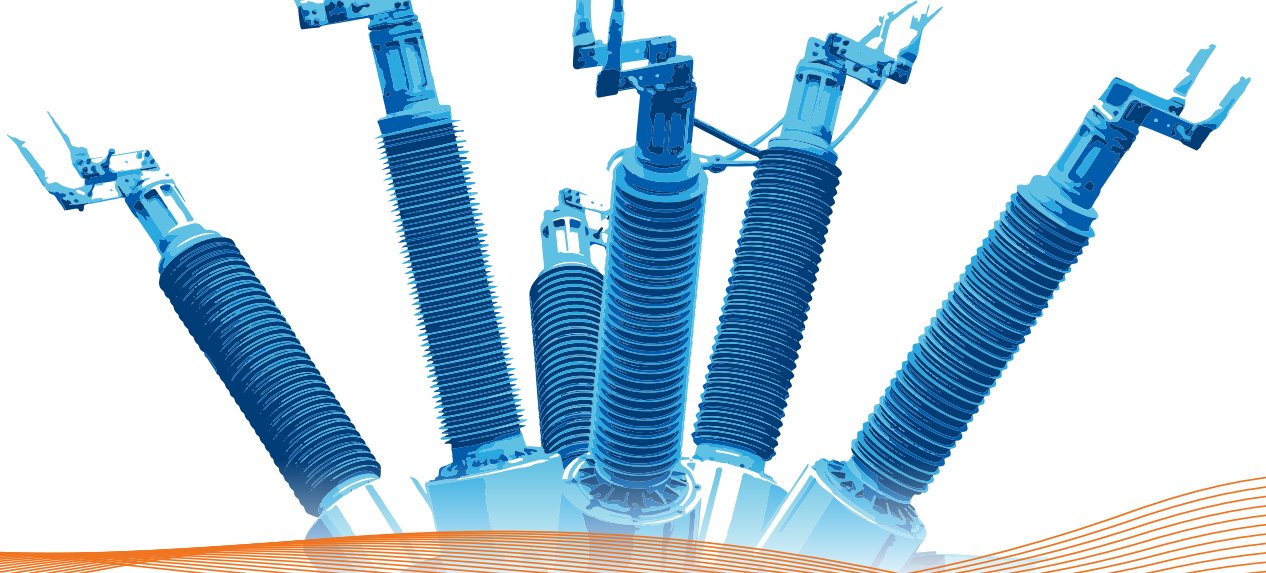


## WRM-10P S2 technical specifications

 <b>physical specifications</b>	<b>Dimensions:</b> 17½" W x 11¾" H x 12½" D (44.5 cm x 29.8 cm x 31.8 cm) <b>Weight:</b> 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>test current range</b>	auto range, 10 A max
 <b>accuracy</b>	1 – 19,999 micro-ohms: ±0.5% reading, ±1 count 20 – 999 milliohms: ±1% reading, ±1 count 1 – 2,000 ohms: ±1.5% reading, ±1 count	 <b>test voltage</b>	36 Vdc max
 <b>display</b>	5" back-lit LCD screen (240 x 128 pixels) viewable in bright sunlight and low-light levels	 <b>keypad</b>	rugged "QWERTY"-style membrane keypad
 <b>printer</b>	built-in 2½" wide thermal printer	 <b>computer interfaces</b>	USB PC, USB Flash drive interfaces
 <b>pc software</b>	Windows®-based software is included with purchase price	 <b>safety</b>	designed to meet IEC 61010 (1995), UL 61010A-1, and CSA-C22.2 standards
 <b>internal test record storage</b>	stores 100 test records of 64 readings each	 <b>humidity</b>	90% RH @ 40°C (104°F) non-condensing
 <b>temperature</b>	<b>Operating:</b> -10°C to +50°C (+15°F to +122°F) <b>Storage:</b> -30°C to +70°C (-22°F to +158°F)	 <b>altitude</b>	2,000 m (6,562 ft) to full safety specifications
 <b>cables</b>	three 50-foot (15.24m) test cables, one ground cable, one power cord, one USB cable and cable carrying bag	 <b>warranty</b>	one year on parts and labor
 <b>options</b>	shipping case		

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





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

Founded in 1991 and located in Ontario, California, USA, Vanguard Instruments™ offers a wide range of diagnostic test equipment that accurately and efficiently measures the health of critical substation equipment, such as transformers, circuit breakers, and protective relays.

Our first product was a computerized, extra high voltage (EHV) circuit breaker analyzer, which became the forerunner of an entire line of EHV circuit breaker test equipment. Over the years, our portfolio has grown tremendously 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 application-specific products.

Our instruments are rugged, reliable, accurate, and user friendly. They eliminate tedious and time-consuming operations, while providing fast, complex test-result calculations. Using our equipment helps reduce errors and eliminates the need to memorize long sequences of procedural steps.

In 2017, Vanguard Instruments became a part of Doble Engineering Company, an energy industry leader in hardware, software, and services that diagnose and monitor the health of critical assets.



**Vanguard Instruments**

A DOBLE COMPANY

1520 S. Hellman Avenue  
Ontario, California 91761, USA  
**Phone** 909-923-9390 • **Fax** 909-923-9391

[www.vanguard-instruments.com](http://www.vanguard-instruments.com)

Revision B. April 13, 2018

© Copyright 2018 Doble Engineering Company

