WRM-10P S2

lightweight winding resistance meter

Vanguard Instruments
A DOBLE COMPANY

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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.

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.

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.

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.

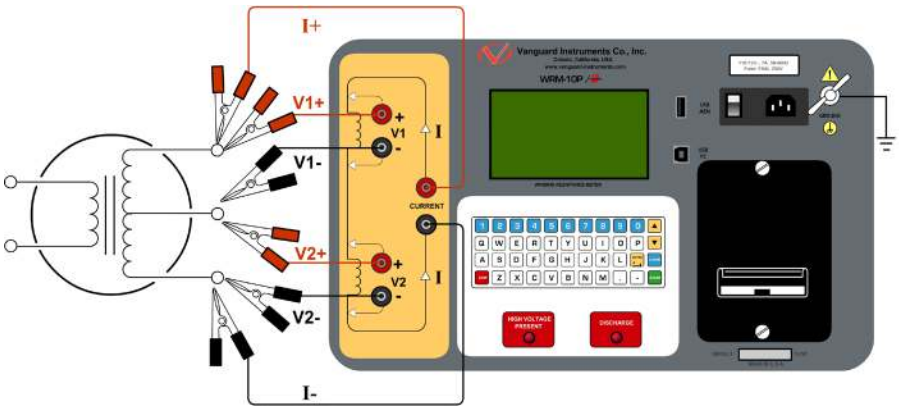
User Interface

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.

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.

WRM-10P test connections



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)

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   Tm = 25.0C 77.0F
REF TEMP    Ts = 85.0C 185.0F
COPPER WINDINGS, Tk = 234.5C

Rs = Rmeas x [(Ts+Tk)/(Tm+Tk)]
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:01/19/17      TIME:12:19:38
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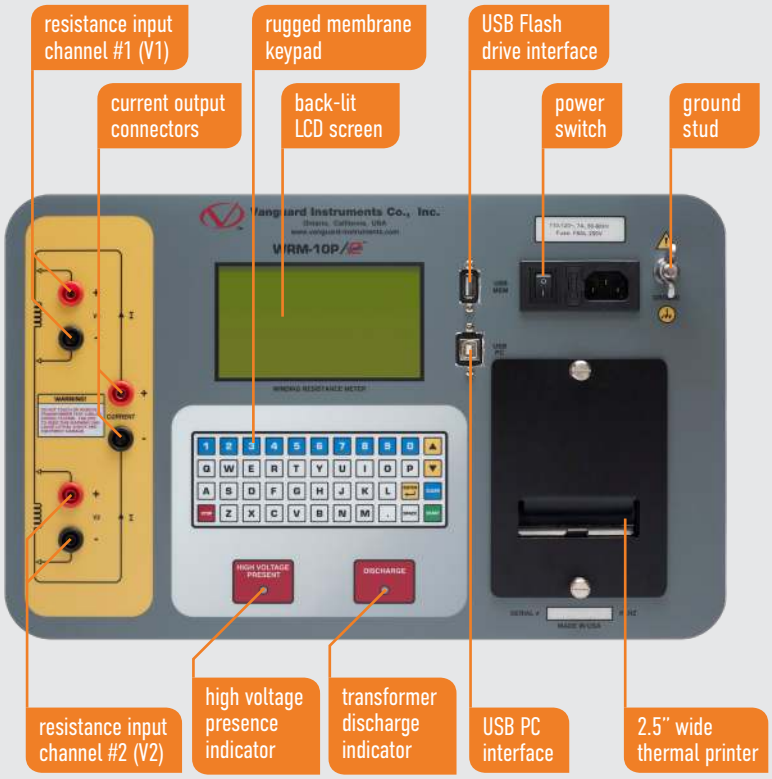
Winding resistance at 25°C

Equivalent resistance value at 85°C

WRM-10P S2 Features



WRM-10P S2 technical specifications

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

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
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