

Certificate of Calibration

Manufacturer **Radian Research, Inc.**
Instrument : **Metronic Portable Standard**
Model: **RM-18-01**
Serial Number **802990**
Error Specification +/- .1% Watthour



**Quality Management System
ISO 9001 Certified**

Customer Name: RADIANT RESEARCH, INC.
Address: 3852 FORTUNE DRIVE
LAFAYETTE, INDIANA 47905

P.O. Number:
CE Number: N/A
RMA / Certificate Number:
Calibration Date: 16-Jun-11

Environmental Conditions
Temperature: 23°C +/- 1°C
Humidity: between 35% and 60%

Based on the recommended calibration interval, the next calibration is due on: 15-Jun-12

Radian Research's As-Found Test Results showed this Instrument to be:

New In Tolerance Out of Tolerance Inoperative Limited Calibration

For Out of Tolerance conditions, As-Found Data Reports are furnished.

Radian Research Inc. certifies the instrument listed above meets or exceeds all published specifications and was calibrated in compliance with ANSI/NCSL Z540-1 using applicable Radian Research procedures which meet the requirements of ISO 9001:2000.

This instrument was calibrated by a Radian Research RS-703A Syntron Automated Calibration System which is traceable to the National Institute of Standards and Technology (NIST). The RS-703A Calibration System is traceable within the limitations of NIST's services, by accuracies derived from accepted values of natural physical constants, or by accuracies derived from accepted ratio type calibration techniques. The RS-703A Calibration System is cross checked and calibrated on a schedule which is adjusted to maintain required accuracies and traceability.

Software used for Calibration: RS-703A Control Program Rel.04.20.02 May 30, 2006
RS-703A serial numbers: 703149

Applicable Traceability & Report Numbers for References used by Radian's Metrology Lab:

Watt-hour, VA-hour, VAR-hour, Q-hour, Amp-hour, Volt-hour, Volt-Squared hour, AC Volt

Radian Dytronic Transfer Standards consisting of (3) RD-22-RTS,
Serial Numbers: 200717, 200718, 200719
NIST Test Report Number: 697/280054-10; Calibration Due Date 6-Jan-2012.

Time Base (Frequency)

Arbiter Systems Model 1083B Satellite-Controlled Frequency Standard s/n B1057. GPS controlled system with an uncertainty of 0.000002ppm. No calibration required.

DC Volts

Fluke Model 732B DC Volt Standard s/n 7703004 with an uncertainty of ± .1ppm.
Fluke Certificate Number 9D5460; Calibration Due Date: 14-July-2012.

Resistance

Guildline Standard Resistor Model 9330/10K s/n 62623, 62624. Guildline Test Certificate Numbers C13274 and C13275; with an Expanded Uncertainty of ± .390ppm. Calibration Due Date: 25-May-2012.

Other

Hewlett Packard 8 Digit Multi-Meter Model 3458A s/n 2823A02816. Agilent Technologies
Test Certificate Number 53298; Calibration Due Date 2-Mar-2012.

Metrology Laboratory Technician Signature

LAB
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in full, without prior written approval of the
Calibration Facility*

Calibration Report

RM-18-01 Portable Test System

Mode.....Watt hour 60 Hertz

Date..... 16-Jun-11

Serial Number..... 802990

RADIANT RESEARCH, INC.

The following data was taken at 3852 FORTUNE DRIVE System. The RS-70 LAFAYETTE, INDIANA 47905 Dytronic Transfer Standards certified by the National Institute of Standards and Technology (NIST) to an uncertainty of 0.002% @ unity and 0.003% @ 60 degrees lagging Power Factor. Calibration temperature is 23 degrees Centigrade. The test time is 15 seconds and the stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed as Percent Error. The RS-703A has at least a 4 times greater accuracy than the Instrument under test.

Voltage & Phase Angle

Amps	120	120	240	240	300	300
	Unity	60°Lag	Unity	60°Lag	Unity	60°Lag
0.25	-0.002	-0.002	0.000	-0.001	-0.002	-0.001
0.5	-0.001	-0.002	0.001	0.000	-0.001	-0.001
1.0	0.002	0.002	0.000	0.000	0.000	0.001
2.0	0.001	0.000	0.000	-0.001	-0.001	0.000
2.5	0.000	0.001	-0.001	0.001	-0.001	0.000
3.0	0.000	-0.001	0.000	0.001	-0.001	-0.001
5.0	0.002	0.000	-0.001	0.002	-0.001	0.001
10.0	0.001	0.001	0.000	0.000	-0.001	0.000
12.0	0.001	0.001	0.000	0.000	-0.002	-0.001
15.0	-0.001	-0.002	-0.001	0.001	-0.001	0.000
20.0	-0.001	-0.003	-0.001	0.001	-0.001	0.000
25.0	0.000	-0.002	-0.002	-0.001	-0.001	0.001
30.0	0.000	-0.003	-0.001	0.001	-0.002	0.000
Average	0.000	-0.001	0.000	0.000	-0.001	0.000
Minimum	-0.002	-0.003	-0.002	-0.001	-0.002	-0.001
Maximum	0.002	0.002	0.001	0.002	0.000	0.001

<u>Overall</u>	Unity	60°Lag
Average	0.000	0.000
Minimum	-0.002	-0.003
Maximum	0.002	0.002