

Certificate of Calibration

Manufacturer **Radian Research, Inc.**
Instrument Model: **RD-33-234 Dytronic Portable Standard**
Serial Number 3XXXXX
Firmware Revision: 07.34.06
Error Specification .01% worst case



Quality Management System
ISO 9001 Certified



CERTIFICATE #3784.01

Customer Name: Customer Name
Address: Customer Address Line 1
 Customer Address Line 2
Calibration Lab Name: Radian Research, Inc.
Calibration Lab Address: 3852 Fortune Drive; Lafayette, IN 47905
Calibration Date: 22-Jun-17

Environmental Conditions	CE Number:	17025
Temperature: 23°C +/- 2°C	P.O.Number:	Sample PO
Humidity: between 30% and 60%	RMA / Certificate Number:	Sample RMA

Physical Condition: Undamaged

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 Z540-1-1994. Identified results are accredited to ISO/IEC 17025:2005 "General Requirements for the Competence of Testing and Calibration laboratories", using applicable Radian Research procedures which meet the requirements of ISO 9001:2008 and ISO/IEC Guide 98-3 "Uncertainty of measurement - Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)".

This instrument was calibrated by a Radian Research RS-933 Syntron Automated Calibration System which is traceable to the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). The Automated Calibration system is cross checked and calibrated on a schedule which is adjusted to maintain required accuracies and traceability. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k=2.

Procedure used for Calibration: 9912164
Software used for Calibration: Radian Source Control Program Rel.04.30.19 Test Release Mar 31, 2011
RS-933 Tool Number: 9911934

Standards Used in This Calibration:

<u>Description</u>	<u>Serial Number(s):</u>	<u>Cal. Source</u>	<u>Cal. Number:</u>	<u>Cal. Due Date:</u>
RS740 Data Collection Module	704108	Radian Research	704108-20170407	4/7/2018
RS711 Syntron with RS932 Boost Module (Phase A)	703201	Radian Research	703201-20170610	6/10/2018
RS711 Syntron with RS932 Boost Module (Phase B)	703198	Radian Research	703198-20170530	5/30/2018
RS711 Syntron with RS932 Boost Module (Phase C)	703199	Radian Research	703199-20170527	5/27/2018

Laboratory Technician Signature



LAB 223

Template 9903256.02

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Calibration Report

RD-33-234 Dytronic Portable Standard

	Function.....	Watt-hour 60 Hz	Phase A
Date.....	22-Jun-17	Uncertainty at Unity.....	16
Serial Number.....	3XXXXX	Uncertainty at 60° Phase Angle....	25

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 watt-hour calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 5 seconds and stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in $\mu\text{Wh}/\text{Wh}$. The Automated Calibration System has at least a 2 times greater accuracy than the instrument under test. The results presented on this page are compliant with ANSI/NCCL Z540-1-1994 and accredited to ISO/IEC 17025:2005.

Voltage & Phase Angle

	120 Unity	120 60°Lag	240 Unity	240 60°Lag	480 Unity	480 60°Lag	600 Unity	600 60°Lag
Amps								
0.2	-3	13	8	10	6	-7	12	5
0.25	-10	3	-10	-1	-12	-14	-1	0
0.3	-11	2	-11	0	-12	-13	-1	2
0.5	-18	-3	-18	-6	-20	-20	-10	-4
1.0	-13	22	-14	18	-15	6	-4	22
2.0	-10	25	-11	21	-12	9	-2	24
2.5	-10	22	-11	19	-12	6	-1	21
3.0	-1	29	-3	25	-4	12	4	26
4.0	-9	23	-11	19	-12	6	-2	21
5.0	-13	19	-14	15	-16	2	-5	18
7.0	-27	14	-28	10	-30	-4	-19	11
10.0	-1	22	-1	18	-2	7	9	23
15.0	-2	19	-3	16	-4	1	6	16
20.0	1	25	1	22	-2	7	9	23
25.0	9	34	9	30	7	15	15	29
30.0	6	31	6	28	4	12	14	27
35.0	2	28	2	24	-1	8	10	24
40.0	-2	24	-3	21	-5	5	6	20
45.0	-1	23	-2	20	-5	3	3	17
50.0	-1	26	-1	23	-4	6	4	20
60.0	-4	33	-5	27	-8	10	1	24
80.0	-3	30	-3	28	-7	9	3	23
100.0	-4	38	-4	36	-9	15	-4	27
120.0	-6	44	-6	43	-12	21	-2	34
150.0	12	56	11	56	6	35	16	47
180.0	11	58	10	57	4	34	9	46
200.0	21	63	20	61	14	40	18	50
Average	-3	27	-3	24	-6	8	3	22
Minimum	-27	-3	-28	-6	-30	-20	-19	-4
Maximum	21	63	20	61	14	40	18	50

<u>Overall</u>	Unity	60°Lag
Average	-2	20
Minimum	-30	-20
Maximum	21	63

Calibration Report

RD-33-234 Dytronic Portable Standard

	Function.....	Watt-hour 60 Hz	Phase B
Date.....	22-Jun-17	Uncertainty at Unity.....	16
Serial Number.....	3XXXXX	Uncertainty at 60° Phase Angle....	25

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 watt-hour calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 5 seconds and stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in $\mu\text{Wh}/\text{Wh}$. The Automated Calibration System has at least a 2 times greater accuracy than the instrument under test. The results presented on this page are compliant with ANSI/NCCL Z540-1-1994 and accredited to ISO/IEC 17025:2005.

Voltage & Phase Angle

	120 Unity	120 60°Lag	240 Unity	240 60°Lag	480 Unity	480 60°Lag	600 Unity	600 60°Lag
Amps								
0.2	-59	10	-42	9	-34	0	-36	11
0.25	-58	0	-40	-1	-35	-6	-29	6
0.3	-55	-2	-40	-1	-34	-3	-28	5
0.5	-57	0	-42	0	-38	-6	-33	2
1.0	-38	24	-25	25	-21	21	-15	31
2.0	-32	24	-20	25	-15	21	-10	30
2.5	-36	18	-25	19	-20	14	-14	25
3.0	-44	2	-33	2	-28	-3	-24	5
4.0	-51	-3	-41	-4	-36	-8	-31	2
5.0	-56	-9	-45	-8	-40	-12	-34	-2
7.0	-37	6	-27	6	-22	1	-17	10
10.0	-33	1	-24	0	-19	-3	-13	7
15.0	-38	-10	-29	-10	-25	-16	-20	-7
20.0	-30	-2	-21	-3	-17	-9	-12	1
25.0	-35	-9	-27	-10	-23	-17	-20	-9
30.0	-40	-13	-32	-13	-28	-21	-23	-12
35.0	-44	-16	-35	-16	-33	-24	-27	-15
40.0	-47	-18	-39	-18	-36	-26	-30	-17
45.0	-47	-20	-39	-20	-37	-29	-33	-21
50.0	-38	-7	-30	-7	-28	-15	-25	-8
60.0	-42	0	-34	-3	-32	-13	-27	-4
80.0	-37	-4	-29	-2	-29	-15	-24	-5
100.0	-37	3	-30	5	-31	-10	-31	-4
120.0	-38	9	-31	11	-33	-5	-28	3
150.0	-29	17	-23	17	-26	-2	-21	8
180.0	-27	18	-22	17	-25	-3	-26	3
200.0	-32	10	-27	7	-31	-14	-32	-8
Average	-41	1	-32	1	-29	-8	-25	1
Minimum	-59	-20	-45	-20	-40	-29	-36	-21
Maximum	-27	24	-20	25	-15	21	-10	31

<u>Overall</u>	Unity	60°Lag
Average	-32	-1
Minimum	-59	-29
Maximum	-10	31

Calibration Report

RD-33-234 Dytronic Portable Standard

	Function.....	Watt-hour 60 Hz	Phase C
Date.....	22-Jun-17	Uncertainty at Unity.....	16
Serial Number.....	3XXXXX	Uncertainty at 60° Phase Angle....	25

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 watt-hour calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 5 seconds and stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in $\mu\text{Wh}/\text{Wh}$. The Automated Calibration System has at least a 2 times greater accuracy than the instrument under test. The results presented on this page are compliant with ANSI/NCSL Z540-1-1994 and accredited to ISO/IEC 17025:2005.

Voltage & Phase Angle

	120 Unity	120 60°Lag	240 Unity	240 60°Lag	480 Unity	480 60°Lag	600 Unity	600 60°Lag
Amps								
0.2	-23	15	-12	23	-6	19	-16	25
0.25	-16	34	-5	37	-1	36	-3	41
0.3	-17	32	-6	37	-1	37	-4	42
0.5	-21	29	-11	32	-7	30	-10	36
1.0	-24	37	-14	40	-10	40	-13	46
2.0	-21	33	-11	36	-7	35	-10	41
2.5	-18	33	-9	36	-5	35	-7	41
3.0	-15	24	-6	26	-2	25	-7	30
4.0	-17	25	-8	27	-4	27	-7	33
5.0	-20	21	-11	24	-7	23	-9	30
7.0	-20	28	-11	30	-7	30	-10	35
10.0	-22	-5	-13	-3	-9	-2	-11	4
15.0	-19	-5	-10	-3	-6	-4	-9	2
20.0	-20	-4	-11	-1	-7	-2	-9	4
25.0	-16	1	-7	4	-3	2	-9	6
30.0	-15	3	-6	6	-2	4	-6	9
35.0	-17	0	-9	2	-5	1	-8	7
40.0	-21	-4	-13	-2	-9	-3	-12	3
45.0	-19	-4	-11	-2	-7	-3	-12	2
50.0	-20	-13	-12	-11	-8	-11	-13	-8
60.0	-23	-6	-15	-6	-12	-7	-15	-3
80.0	-22	6	-14	6	-11	4	-14	10
100.0	-21	11	-14	10	-10	8	-18	10
120.0	-23	15	-16	13	-13	12	-16	16
150.0	-16	21	-12	14	-8	13	-11	19
180.0	-14	23	-12	13	-7	14	-15	17
200.0	-22	11	-21	-2	-15	1	-24	3
Average	-19	13	-11	14	-7	14	-11	18
Minimum	-24	-13	-21	-11	-15	-11	-24	-8
Maximum	-14	37	-5	40	-1	40	-3	46

<u>Overall</u>	Unity	60°Lag
Average	-12	15
Minimum	-24	-13
Maximum	-1	46

Calibration Report

RD-33-234 Dytronic Portable Standard

	Function.....	Watt-hour 60 Hz	Total
Date.....	22-Jun-17	Uncertainty at Unity.....	23
Serial Number.....	3XXXXX	Uncertainty at 60° Phase Angle....	40

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 watt-hour calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 5 seconds and stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in $\mu\text{Wh}/\text{Wh}$. The Automated Calibration System has at least a 2 times greater accuracy than the instrument under test. The results presented on this page are compliant with ANSI/NCCL Z540-1-1994 and accredited to ISO/IEC 17025:2005.

Voltage & Phase Angle

	120 Unity	120 60°Lag	240 Unity	240 60°Lag	480 Unity	480 60°Lag	600 Unity	600 60°Lag
Amps								
0.2	-28	13	-15	14	-12	4	-13	14
0.25	-28	13	-18	12	-16	5	-11	16
0.3	-28	11	-19	12	-16	7	-11	16
0.5	-32	9	-24	9	-22	1	-18	11
1.0	-25	28	-18	28	-15	22	-11	33
2.0	-21	27	-14	27	-12	22	-7	31
2.5	-21	24	-15	25	-12	18	-8	29
3.0	-20	18	-14	18	-11	11	-9	20
4.0	-26	15	-20	14	-18	8	-13	19
5.0	-30	10	-24	10	-21	4	-16	15
7.0	-28	16	-22	16	-20	9	-16	19
10.0	-18	6	-13	5	-10	1	-5	11
15.0	-19	1	-14	1	-12	-6	-8	4
20.0	-16	6	-10	6	-9	-1	-4	9
25.0	-14	9	-8	8	-6	0	-5	9
30.0	-16	7	-11	7	-9	-2	-5	8
35.0	-20	4	-14	3	-13	-5	-9	5
40.0	-23	1	-18	0	-17	-8	-12	2
45.0	-23	0	-17	-1	-16	-10	-14	-1
50.0	-20	2	-14	1	-13	-7	-12	1
60.0	-23	9	-18	6	-17	-3	-14	5
80.0	-21	10	-16	11	-16	-1	-11	9
100.0	-21	17	-16	17	-17	5	-18	11
120.0	-22	23	-18	22	-19	9	-15	18
150.0	-11	31	-8	29	-9	15	-5	24
180.0	-10	33	-8	29	-9	15	-10	22
200.0	-11	28	-10	22	-11	9	-12	15
Average	-21	14	-15	13	-14	5	-11	14
Minimum	-32	0	-24	-1	-22	-10	-18	-1
Maximum	-10	33	-8	29	-6	22	-4	33

<u>Overall</u>	Unity	60°Lag
Average	-15	11
Minimum	-32	-10
Maximum	-4	33

Calibration Report

RD-33-234 Dytronic Portable Standard

	Function.....	Watts	60 Hz	Phase A
Date.....	22-Jun-17	Uncertainty at Unity.....		16
Serial Number.....	3XXXXX	Uncertainty at 60° Phase Angle....		25

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 watt calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 5 seconds and stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in $\mu\text{W}/\text{W}$. The Automated Calibration System has at least a 2 times greater accuracy than the instrument under test. The results presented on this page are compliant with ANSI/NCSL Z540-1-1994 and accredited to ISO/IEC 17025:2005.

Voltage & Phase Angle

	120 Unity	120 60°Lag	240 Unity	240 60°Lag	480 Unity	480 60°Lag	600 Unity	600 60°Lag
Amps								
0.2	-2	13	8	10	6	-7	12	5
0.25	-10	4	-9	0	-12	-13	-1	0
0.3	-11	3	-10	-1	-12	-13	-1	3
0.5	-17	-3	-19	-6	-20	-20	-9	-4
1.0	-13	22	-14	18	-15	6	-4	22
2.0	-9	26	-11	21	-12	9	-1	24
2.5	-10	22	-11	19	-12	6	-1	22
3.0	-1	29	-2	25	-4	12	5	26
4.0	-9	23	-11	19	-12	6	-2	21
5.0	-13	19	-14	15	-16	2	-5	18
7.0	-27	14	-28	10	-30	-3	-19	11
10.0	-1	22	-1	18	-2	7	9	23
15.0	-2	18	-3	16	-4	1	6	16
20.0	1	25	1	22	-1	7	10	23
25.0	10	34	9	30	7	15	15	29
30.0	6	32	6	28	4	12	14	27
35.0	3	29	2	24	-1	9	10	24
40.0	-2	24	-3	21	-5	5	6	20
45.0	-1	24	-3	20	-6	3	3	17
50.0	0	26	-1	22	-4	7	3	20
60.0	-4	33	-5	27	-8	10	1	24
80.0	-3	30	-3	28	-7	8	3	24
100.0	-4	38	-4	37	-9	16	-3	27
120.0	-5	45	-6	43	-12	21	-1	34
150.0	12	56	12	57	6	35	16	47
180.0	12	58	11	58	5	34	9	46
200.0	22	63	20	61	14	40	18	50
Average	-3	27	-3	24	-6	8	3	22
Minimum	-27	-3	-28	-6	-30	-20	-19	-4
Maximum	22	63	20	61	14	40	18	50

<u>Overall</u>	Unity	60°Lag
Average	-2	20
Minimum	-30	-20
Maximum	22	63

Calibration Report

RD-33-234 Dytronic Portable Standard

	Function.....	Watts	60 Hz	Phase B
Date.....	22-Jun-17	Uncertainty at Unity.....		16
Serial Number.....	3XXXXX	Uncertainty at 60° Phase Angle....		25

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 watt calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 5 seconds and stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in $\mu\text{W/W}$. The Automated Calibration System has at least a 2 times greater accuracy than the instrument under test. The results presented on this page are compliant with ANSI/NCCL Z540-1-1994 and accredited to ISO/IEC 17025:2005.

Voltage & Phase Angle

	120 Unity	120 60°Lag	240 Unity	240 60°Lag	480 Unity	480 60°Lag	600 Unity	600 60°Lag
Amps								
0.2	-59	10	-42	9	-34	0	-36	11
0.25	-58	2	-39	-1	-34	-6	-29	5
0.3	-56	-1	-39	-3	-33	-4	-28	5
0.5	-57	-1	-42	1	-38	-6	-33	3
1.0	-38	24	-25	25	-20	21	-15	30
2.0	-32	25	-20	25	-15	21	-9	30
2.5	-36	18	-24	19	-20	14	-14	25
3.0	-43	2	-32	2	-28	-4	-24	5
4.0	-51	-4	-41	-4	-36	-8	-31	2
5.0	-55	-8	-44	-8	-40	-12	-34	-2
7.0	-37	7	-27	7	-22	1	-17	11
10.0	-33	1	-24	0	-20	-3	-13	7
15.0	-38	-9	-29	-10	-25	-16	-20	-7
20.0	-30	-1	-21	-3	-17	-9	-12	1
25.0	-35	-9	-26	-10	-23	-17	-20	-9
30.0	-40	-13	-32	-13	-28	-21	-23	-12
35.0	-43	-16	-35	-16	-33	-23	-27	-15
40.0	-46	-18	-38	-17	-36	-26	-30	-17
45.0	-47	-20	-39	-20	-37	-29	-33	-21
50.0	-38	-6	-30	-7	-28	-15	-25	-8
60.0	-41	0	-34	-3	-32	-12	-27	-4
80.0	-36	-4	-29	-1	-29	-15	-23	-5
100.0	-38	3	-30	5	-31	-9	-31	-4
120.0	-37	10	-31	11	-32	-5	-28	3
150.0	-29	17	-23	17	-25	-1	-21	8
180.0	-27	18	-22	17	-25	-3	-25	3
200.0	-31	10	-27	8	-31	-13	-31	-8
Average	-41	1	-31	1	-29	-7	-24	1
Minimum	-59	-20	-44	-20	-40	-29	-36	-21
Maximum	-27	25	-20	25	-15	21	-9	30

Overall	Unity	60°Lag
Average	-31	-1
Minimum	-59	-29
Maximum	-9	30

Calibration Report

RD-33-234 Dytronic Portable Standard

	Function.....	Watts	60 Hz	Phase C
Date.....	22-Jun-17	Uncertainty at Unity.....		16
Serial Number.....	3XXXXX	Uncertainty at 60° Phase Angle....		25

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 watt calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 5 seconds and stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in $\mu\text{W/W}$. The Automated Calibration System has at least a 2 times greater accuracy than the instrument under test. The results presented on this page are compliant with ANSI/NCCL Z540-1-1994 and accredited to ISO/IEC 17025:2005.

Voltage & Phase Angle

	120 Unity	120 60°Lag	240 Unity	240 60°Lag	480 Unity	480 60°Lag	600 Unity	600 60°Lag
Amps								
0.2	-22	15	-12	23	-7	19	-16	24
0.25	-15	35	-4	36	-1	35	-3	42
0.3	-17	32	-5	37	-1	38	-4	42
0.5	-21	30	-11	32	-7	31	-10	36
1.0	-24	38	-14	40	-11	41	-14	46
2.0	-21	34	-11	36	-7	36	-10	41
2.5	-18	33	-8	36	-5	36	-7	41
3.0	-15	23	-6	27	-2	26	-7	30
4.0	-17	25	-8	28	-4	27	-8	33
5.0	-20	21	-11	24	-7	23	-10	30
7.0	-20	28	-11	31	-6	30	-11	35
10.0	-22	-6	-13	-3	-8	-2	-11	4
15.0	-19	-6	-9	-3	-6	-4	-10	2
20.0	-20	-4	-11	-1	-7	-1	-9	4
25.0	-16	1	-7	4	-3	2	-9	7
30.0	-15	3	-6	5	-2	4	-6	9
35.0	-18	0	-9	2	-5	1	-8	7
40.0	-21	-4	-13	-2	-9	-2	-11	3
45.0	-19	-4	-10	-2	-7	-3	-12	1
50.0	-20	-13	-12	-11	-8	-11	-13	-8
60.0	-23	-6	-15	-6	-12	-7	-15	-3
80.0	-22	6	-14	6	-11	4	-13	9
100.0	-22	11	-14	11	-10	8	-19	10
120.0	-23	16	-16	14	-12	12	-16	16
150.0	-16	21	-12	14	-7	13	-11	19
180.0	-14	23	-12	13	-7	15	-15	17
200.0	-22	11	-21	-2	-15	1	-23	2
Average	-19	13	-11	14	-7	14	-11	19
Minimum	-24	-13	-21	-11	-15	-11	-23	-8
Maximum	-14	38	-4	40	-1	41	-3	46

Overall	Unity	60°Lag
Average	-12	15
Minimum	-24	-13
Maximum	-1	46

Calibration Report

RD-33-234 Dytronic Portable Standard

	Function.....	Watts	60 Hz	Total
Date.....	22-Jun-17	Uncertainty at Unity.....		23
Serial Number.....	3XXXXX	Uncertainty at 60° Phase Angle....		40

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 watt calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 5 seconds and stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in $\mu\text{W}/\text{W}$. The Automated Calibration System has at least a 2 times greater accuracy than the instrument under test. The results presented on this page are compliant with ANSI/NCSL Z540-1-1994 and accredited to ISO/IEC 17025:2005.

Voltage & Phase Angle

	120 Unity	120 60°Lag	240 Unity	240 60°Lag	480 Unity	480 60°Lag	600 Unity	600 60°Lag
Amps								
0.2	-28	13	-15	14	-12	4	-13	14
0.25	-28	13	-18	12	-16	5	-11	16
0.3	-28	12	-19	11	-16	7	-11	16
0.5	-32	8	-24	9	-22	1	-18	11
1.0	-25	27	-18	28	-15	22	-11	33
2.0	-20	28	-14	27	-12	22	-7	32
2.5	-21	24	-15	25	-12	18	-8	29
3.0	-20	18	-14	18	-11	11	-9	20
4.0	-26	15	-20	14	-17	9	-13	19
5.0	-30	10	-23	11	-21	5	-16	15
7.0	-28	17	-22	16	-20	9	-16	19
10.0	-19	6	-13	5	-10	1	-6	11
15.0	-19	1	-14	1	-12	-6	-8	3
20.0	-16	7	-10	6	-8	-1	-3	9
25.0	-14	9	-8	8	-6	0	-4	9
30.0	-16	7	-11	7	-9	-2	-5	8
35.0	-19	4	-14	3	-13	-5	-9	5
40.0	-23	1	-18	1	-17	-8	-12	2
45.0	-23	0	-17	0	-16	-10	-14	-1
50.0	-19	2	-14	1	-13	-6	-12	2
60.0	-23	9	-18	6	-17	-3	-14	6
80.0	-20	10	-16	11	-16	-1	-11	9
100.0	-21	17	-16	17	-17	5	-18	11
120.0	-22	23	-18	22	-19	9	-15	17
150.0	-11	32	-8	30	-9	16	-5	24
180.0	-9	33	-8	30	-9	15	-11	22
200.0	-11	28	-10	22	-11	9	-12	15
Average	-21	14	-15	13	-14	5	-11	14
Minimum	-32	0	-24	0	-22	-10	-18	-1
Maximum	-9	33	-8	30	-6	22	-3	33

<u>Overall</u>	Unity	60°Lag
Average	-15	11
Minimum	-32	-10
Maximum	-3	33

Calibration Report

RD-33-234 Dytronic Portable Standard

Function..... VAR-hour 60 Hz Phase A

Date..... 22-Jun-17 Uncertainty 24

Serial Number..... 3XXXXX

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 VAR-hour calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 2 seconds and stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in μ VARh/VARh. The Automated Calibration System has at least a 2 times greater accuracy than the instrument under test. The results presented on this page are compliant with ANSI/NCSL Z540-1-1994 and accredited to ISO/IEC 17025:2005.

Voltage & Phase Angle

Amps	120	120	240	240	480	480	600	600
	90°Lag	30°Lag	90°Lag	30°Lag	90°Lag	30°Lag	90°Lag	30°Lag
0.2	-5	9	-4	13	-14	8	-1	19
0.25	-15	-9	-13	-6	-24	-8	-10	1
0.3	-17	-12	-16	-8	-27	-4	-11	1
0.5	-17	-15	-15	-11	-25	-7	-12	0
1.0	-16	-22	-14	-18	-23	-17	-10	-8
2.0	-15	-20	-13	-16	-22	-16	-9	-7
2.5	-17	-20	-15	-16	-24	-19	-10	-9
3.0	-8	-8	-5	-1	-13	0	1	10
4.0	-13	-16	-10	-11	-20	-13	-7	-2
5.0	-16	-18	-14	-13	-24	-17	-10	-7
7.0	-27	-37	-24	-31	-32	-33	-19	-20
10.0	-15	-16	-13	-10	-23	-17	-9	-6
15.0	-14	-14	-10	-6	-21	-14	-8	1
20.0	-14	-15	-11	-7	-23	-18	-9	-4
25.0	-6	-6	-1	4	-12	-2	2	12
30.0	-8	-8	-3	2	-15	-9	-2	7
35.0	-11	-11	-6	-1	-19	-14	-6	2
40.0	-14	-14	-9	-3	-22	-16	-8	-3
45.0	-14	-13	-8	-1	-23	-16	-10	-3
50.0	-12	-12	-4	3	-16	-9	-3	6
60.0	-13	-15	-4	1	-19	-15	-7	1
80.0	-16	-18	-6	3	-21	-18	-8	-3
100.0	-17	-21	-5	2	-23	-21	-11	-8
120.0	-18	-24	-4	3	-24	-22	-13	-9
150.0	-12	-16	4	16	-17	-14	-5	-2
180.0	-14	-22	4	14	-19	-17	-8	-9
200.0	-10	-15	10	23	-14	-10	-4	-1
Average	-14	-15	-8	-3	-21	-13	-8	-1
Minimum	-27	-37	-24	-31	-32	-33	-19	-20
Maximum	-5	9	10	23	-12	8	2	19

Overall	90°Lag	30°Lag
Average	-12	-8
Minimum	-32	-37
Maximum	10	23

Calibration Report

RD-33-234 Dytronic Portable Standard

Function..... VAR-hour 60 Hz Phase B

Date..... 22-Jun-17 Uncertainty 24

Serial Number..... 3XXXXX

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 VAR-hour calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 2 seconds and stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in μ VARh/VARh. The Automated Calibration System has at least a 2 times greater accuracy than the instrument under test. The results presented on this page are compliant with ANSI/NCSS Z540-1-1994 and accredited to ISO/IEC 17025:2005.

Voltage & Phase Angle

Amps	120	120	240	240	480	480	600	600
	90°Lag	30°Lag	90°Lag	30°Lag	90°Lag	30°Lag	90°Lag	30°Lag
0.2	-34	-49	-26	-29	0	29	10	36
0.25	-36	-41	-28	-35	-8	19	1	20
0.3	-38	-47	-31	-39	-13	10	-4	10
0.5	-30	-39	-21	-29	-2	25	7	29
1.0	-26	-37	-18	-25	3	26	11	29
2.0	-22	-28	-14	-15	7	35	15	40
2.5	-28	-33	-21	-23	-4	20	5	22
3.0	-33	-27	-22	-7	4	54	16	64
4.0	-40	-40	-31	-25	-11	23	-3	29
5.0	-45	-45	-38	-33	-21	9	-13	11
7.0	-22	-18	-11	2	11	53	20	63
10.0	-25	-19	-18	-4	-1	35	7	40
15.0	-22	-9	-12	13	8	58	17	68
20.0	-23	-8	-14	9	1	41	9	50
25.0	-27	-8	-14	19	9	66	20	83
30.0	-31	-14	-19	10	0	48	8	64
35.0	-36	-20	-24	2	-8	34	0	47
40.0	-39	-24	-28	-2	-14	26	-6	36
45.0	-40	-24	-29	-2	-17	22	-11	29
50.0	-26	-11	-9	21	11	64	22	81
60.0	-28	-17	-13	15	3	47	11	62
80.0	-31	-17	-15	15	-5	36	3	44
100.0	-33	-21	-16	13	-10	25	-5	31
120.0	-33	-22	-15	14	-13	20	-10	24
150.0	-31	-17	-12	21	-14	19	-10	20
180.0	-32	-19	-11	24	-16	15	-14	14
200.0	-36	-20	-8	24	-21	12	-14	11
Average	-31	-25	-19	-2	-5	32	3	39
Minimum	-45	-49	-38	-39	-21	9	-14	10
Maximum	-22	-8	-8	24	11	66	22	83

Overall	90°Lag	30°Lag
Average	-13	11
Minimum	-45	-49
Maximum	22	83

Calibration Report

RD-33-234 Dytronic Portable Standard

Function..... VAR-hour 60 Hz Phase C

Date..... 22-Jun-17 Uncertainty 24

Serial Number..... 3XXXXX

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 VAR-hour calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 2 seconds and stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in μ VARh/VARh. The Automated Calibration System has at least a 2 times greater accuracy than the instrument under test. The results presented on this page are compliant with ANSI/NCSL Z540-1-1994 and accredited to ISO/IEC 17025:2005.

Voltage & Phase Angle

Amps	120	120	240	240	480	480	600	600
	90°Lag	30°Lag	90°Lag	30°Lag	90°Lag	30°Lag	90°Lag	30°Lag
0.2	-20	-36	-15	-23	3	33	5	14
0.25	-18	-38	-13	-29	3	20	3	2
0.3	-20	-42	-17	-33	-2	14	-2	-6
0.5	-19	-43	-14	-32	1	19	1	-1
1.0	-19	-43	-14	-31	1	19	1	-1
2.0	-18	-34	-13	-23	2	23	2	8
2.5	-20	-33	-15	-24	-3	17	-2	-1
3.0	-13	-12	-6	3	12	54	15	43
4.0	-15	-21	-10	-9	5	33	5	21
5.0	-19	-23	-15	-14	-2	23	-2	9
7.0	-15	-25	-8	-12	8	30	9	23
10.0	-20	-15	-15	-4	-3	24	-2	19
15.0	-15	-8	-10	6	5	36	5	37
20.0	-19	-12	-15	0	-3	24	-2	21
25.0	-14	-6	-6	12	10	45	13	48
30.0	-14	-7	-7	7	7	36	7	36
35.0	-17	-10	-11	3	1	27	2	26
40.0	-20	-12	-14	0	-4	21	-3	18
45.0	-19	-11	-14	1	-5	20	-5	14
50.0	-16	2	-7	20	8	51	11	52
60.0	-17	-4	-10	13	3	40	3	39
80.0	-21	-15	-14	3	-4	22	-3	18
100.0	-21	-14	-14	2	-7	14	-8	10
120.0	-22	-16	-15	0	-10	8	-12	4
150.0	-24	-18	-17	-2	-14	3	-15	-3
180.0	-26	-23	-19	-7	-17	-4	-18	-11
200.0	-33	-29	-24	-14	-24	-12	-25	-18
Average	-19	-20	-13	-7	-1	24	-1	16
Minimum	-33	-43	-24	-33	-24	-12	-25	-18
Maximum	-13	2	-6	20	12	54	15	52

Overall	90°Lag	30°Lag
Average	-8	3
Minimum	-33	-43
Maximum	15	54

Calibration Report

RD-33-234 Dytronic Portable Standard

Function..... VAR-hour 60 Hz Total

Date..... 22-Jun-17 Uncertainty 39

Serial Number..... 3XXXXX

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 VAR-hour calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 2 seconds and stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in μ VARh/VARh. The Automated Calibration System has at least a 2 times greater accuracy than the instrument under test. The results presented on this page are compliant with ANSI/NCSL Z540-1-1994 and accredited to ISO/IEC 17025:2005.

Voltage & Phase Angle

Amps	120 90°Lag	120 30°Lag	240 90°Lag	240 30°Lag	480 90°Lag	480 30°Lag	600 90°Lag	600 30°Lag
0.2	-20	-26	-15	-13	-4	23	5	23
0.25	-23	-29	-18	-23	-10	11	-2	8
0.3	-25	-34	-21	-27	-14	7	-6	1
0.5	-22	-33	-17	-24	-9	12	-1	9
1.0	-20	-34	-15	-25	-7	9	1	7
2.0	-19	-27	-13	-18	-4	14	3	14
2.5	-21	-29	-17	-21	-10	6	-3	4
3.0	-18	-16	-11	-2	1	36	10	39
4.0	-23	-26	-17	-15	-9	14	-2	16
5.0	-27	-29	-23	-20	-16	5	-8	4
7.0	-21	-27	-15	-14	-4	17	3	22
10.0	-20	-17	-15	-6	-9	14	-1	17
15.0	-17	-10	-11	4	-2	27	5	35
20.0	-19	-11	-13	1	-8	15	-1	22
25.0	-16	-7	-7	11	3	36	12	48
30.0	-18	-10	-9	6	-3	25	4	36
35.0	-21	-14	-14	2	-9	16	-1	25
40.0	-24	-17	-17	-2	-13	10	-6	17
45.0	-24	-16	-17	-1	-15	8	-9	13
50.0	-18	-7	-7	15	1	35	10	46
60.0	-19	-12	-9	10	-4	24	3	34
80.0	-23	-17	-11	7	-10	13	-3	20
100.0	-24	-19	-12	5	-14	6	-8	11
120.0	-24	-21	-11	6	-16	2	-12	6
150.0	-22	-17	-8	12	-15	2	-10	5
180.0	-24	-22	-9	10	-17	-2	-13	-2
200.0	-26	-22	-8	11	-20	-3	-14	-3
Average	-21	-20	-13	-4	-9	14	-2	18
Minimum	-27	-34	-23	-27	-20	-3	-14	-3
Maximum	-16	-7	-7	15	3	36	12	48

Overall	90°Lag	30°Lag
Average	-11	2
Minimum	-27	-34
Maximum	12	48

Calibration Report

RD-33-234 Dytronic Portable Standard

Function..... VAR 60 Hz Phase A

Date..... 22-Jun-17 Uncertainty 24

Serial Number..... 3XXXXX

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 VAR calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 2 seconds and stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in μ VAR/VAR. The Automated Calibration System has at least a 2 times greater accuracy than the instrument under test. The results presented on this page are compliant with ANSI/NCSS Z540-1-1994 and accredited to ISO/IEC 17025:2005.

Voltage & Phase Angle

Amps	120	120	240	240	480	480	600	600
	90°Lag	30°Lag	90°Lag	30°Lag	90°Lag	30°Lag	90°Lag	30°Lag
0.2	-5	9	-4	15	-14	7	0	19
0.25	-15	-10	-13	-8	-24	-6	-10	1
0.3	-17	-12	-16	-7	-27	-4	-12	2
0.5	-17	-16	-15	-11	-25	-8	-12	0
1.0	-16	-20	-14	-19	-23	-16	-10	-9
2.0	-14	-21	-13	-15	-21	-15	-9	-7
2.5	-17	-22	-15	-16	-24	-19	-10	-9
3.0	-8	-8	-5	-1	-13	1	1	10
4.0	-13	-16	-10	-12	-19	-13	-7	-1
5.0	-16	-17	-14	-13	-24	-17	-10	-7
7.0	-27	-38	-24	-32	-32	-31	-19	-20
10.0	-15	-16	-13	-10	-24	-17	-9	-6
15.0	-14	-16	-10	-5	-20	-13	-8	2
20.0	-15	-15	-11	-9	-23	-17	-9	-4
25.0	-6	-9	-1	5	-11	-2	2	13
30.0	-8	-8	-3	2	-15	-10	-2	7
35.0	-11	-10	-6	-1	-19	-13	-5	2
40.0	-14	-13	-8	-3	-22	-17	-8	-2
45.0	-14	-12	-8	0	-23	-16	-10	-3
50.0	-12	-13	-4	3	-16	-9	-2	6
60.0	-13	-15	-4	0	-19	-15	-6	1
80.0	-15	-19	-6	4	-21	-17	-8	-4
100.0	-17	-21	-5	3	-23	-20	-11	-7
120.0	-18	-23	-4	3	-24	-22	-13	-9
150.0	-11	-15	4	15	-17	-15	-5	-2
180.0	-14	-23	4	14	-18	-16	-8	-8
200.0	-10	-13	9	23	-14	-10	-4	0
Average	-14	-15	-8	-3	-21	-13	-7	-1
Minimum	-27	-38	-24	-32	-32	-31	-19	-20
Maximum	-5	9	9	23	-11	7	2	19

Overall	90°Lag	30°Lag
Average	-12	-8
Minimum	-32	-38
Maximum	9	23

Calibration Report

RD-33-234 Dytronic Portable Standard

Function..... VAR 60 Hz Phase B

Date..... 22-Jun-17 Uncertainty 24

Serial Number..... 3XXXXX

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 VAR calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 2 seconds and stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in μ VAR/VAR. The Automated Calibration System has at least a 2 times greater accuracy than the instrument under test. The results presented on this page are compliant with ANSI/NCSS Z540-1-1994 and accredited to ISO/IEC 17025:2005.

Voltage & Phase Angle

Amps	120	120	240	240	480	480	600	600
	90°Lag	30°Lag	90°Lag	30°Lag	90°Lag	30°Lag	90°Lag	30°Lag
0.2	-34	-49	-26	-30	1	28	11	36
0.25	-36	-38	-29	-35	-9	22	2	20
0.3	-38	-45	-31	-40	-13	13	-4	10
0.5	-30	-38	-22	-29	-1	26	7	27
1.0	-25	-36	-17	-25	3	28	10	31
2.0	-22	-27	-14	-15	7	35	15	41
2.5	-28	-36	-20	-23	-3	19	5	22
3.0	-33	-26	-22	-5	4	54	15	64
4.0	-39	-40	-30	-25	-11	23	-3	31
5.0	-45	-45	-38	-32	-21	10	-13	12
7.0	-22	-18	-11	2	11	53	20	63
10.0	-25	-17	-18	-4	-1	35	7	39
15.0	-23	-9	-12	12	8	58	17	68
20.0	-23	-9	-14	10	1	40	9	49
25.0	-27	-7	-14	18	9	67	20	83
30.0	-30	-13	-18	9	0	47	8	63
35.0	-36	-21	-24	4	-9	33	0	47
40.0	-39	-25	-28	-2	-14	27	-6	36
45.0	-39	-23	-28	-4	-17	22	-10	31
50.0	-25	-13	-9	19	11	63	23	80
60.0	-28	-15	-12	16	3	48	12	63
80.0	-31	-17	-15	14	-5	35	3	43
100.0	-32	-20	-16	13	-10	25	-5	31
120.0	-33	-22	-14	14	-13	21	-9	24
150.0	-31	-17	-12	23	-14	20	-10	21
180.0	-33	-19	-11	23	-16	16	-13	13
200.0	-36	-20	-8	25	-21	13	-14	12
Average	-31	-25	-19	-2	-5	33	4	39
Minimum	-45	-49	-38	-40	-21	10	-14	10
Maximum	-22	-7	-8	25	11	67	23	83

<u>Overall</u>	90°Lag	30°Lag
Average	-13	11
Minimum	-45	-49
Maximum	23	83

Calibration Report

RD-33-234 Dytronic Portable Standard

Function..... VAR 60 Hz Phase C

Date..... 22-Jun-17 Uncertainty 24

Serial Number..... 3XXXXX

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 VAR calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 2 seconds and stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in μ VAR/VAR. The Automated Calibration System has at least a 2 times greater accuracy than the instrument under test. The results presented on this page are compliant with ANSI/NCCL Z540-1-1994 and accredited to ISO/IEC 17025:2005.

Voltage & Phase Angle

Amps	120	120	240	240	480	480	600	600
	90°Lag	30°Lag	90°Lag	30°Lag	90°Lag	30°Lag	90°Lag	30°Lag
0.2	-20	-36	-16	-23	3	33	5	16
0.25	-18	-37	-13	-27	3	19	3	0
0.3	-20	-41	-16	-33	-2	13	-2	-6
0.5	-20	-43	-15	-35	1	20	2	-2
1.0	-19	-43	-14	-31	1	19	1	-1
2.0	-18	-35	-13	-23	2	24	2	8
2.5	-20	-33	-15	-25	-3	15	-2	-1
3.0	-13	-12	-6	3	12	54	15	44
4.0	-15	-22	-10	-10	5	34	5	21
5.0	-19	-24	-15	-13	-2	21	-2	10
7.0	-15	-25	-8	-12	8	29	9	22
10.0	-20	-16	-16	-4	-3	23	-2	18
15.0	-16	-7	-10	6	5	37	6	37
20.0	-19	-11	-14	1	-3	23	-2	21
25.0	-14	-7	-6	11	11	45	13	48
30.0	-14	-8	-7	5	7	36	7	37
35.0	-17	-11	-11	3	1	26	3	26
40.0	-20	-12	-14	-1	-4	21	-3	19
45.0	-19	-11	-14	1	-5	21	-5	15
50.0	-15	2	-7	19	8	51	11	53
60.0	-17	-3	-9	15	3	40	4	40
80.0	-21	-14	-13	4	-5	20	-3	20
100.0	-21	-16	-14	2	-8	15	-8	9
120.0	-22	-17	-15	1	-10	7	-13	5
150.0	-25	-19	-17	-2	-14	3	-14	-2
180.0	-26	-24	-19	-7	-17	-5	-18	-12
200.0	-33	-28	-24	-13	-23	-11	-24	-19
Average	-19	-20	-13	-7	-1	23	-1	16
Minimum	-33	-43	-24	-35	-23	-11	-24	-19
Maximum	-13	2	-6	19	12	54	15	53

<u>Overall</u>	90°Lag	30°Lag
Average	-8	3
Minimum	-33	-43
Maximum	15	54

Calibration Report

RD-33-234 Dytronic Portable Standard

	Function.....	VAR	60 Hz	Total
Date.....	22-Jun-17	Uncertainty		39
Serial Number.....	3XXXXX			

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 VAR calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 2 seconds and stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in μ VAR/VAR. The Automated Calibration System has at least a 2 times greater accuracy than the instrument under test. The results presented on this page are compliant with ANSI/NCSL Z540-1-1994 and accredited to ISO/IEC 17025:2005.

Voltage & Phase Angle

Amps	120 90°Lag	120 30°Lag	240 90°Lag	240 30°Lag	480 90°Lag	480 30°Lag	600 90°Lag	600 30°Lag
0.2	-19	-25	-15	-12	-4	23	5	23
0.25	-23	-29	-18	-25	-10	12	-1	8
0.3	-25	-34	-21	-26	-14	8	-6	1
0.5	-22	-32	-17	-24	-8	13	-1	9
1.0	-20	-34	-15	-24	-7	9	0	7
2.0	-18	-27	-13	-18	-4	14	3	14
2.5	-21	-29	-17	-21	-10	6	-2	4
3.0	-18	-17	-11	-2	1	36	11	39
4.0	-22	-25	-17	-16	-8	14	-2	17
5.0	-26	-29	-23	-20	-16	5	-8	5
7.0	-21	-26	-15	-13	-5	16	3	22
10.0	-20	-16	-16	-6	-9	14	-2	17
15.0	-17	-10	-11	4	-3	26	5	35
20.0	-19	-12	-13	0	-8	16	0	22
25.0	-16	-7	-7	12	3	37	12	48
30.0	-17	-10	-10	6	-3	24	5	36
35.0	-21	-13	-14	1	-9	16	-1	26
40.0	-24	-16	-17	-2	-14	11	-6	17
45.0	-24	-16	-17	-1	-15	8	-8	14
50.0	-17	-7	-7	15	1	35	10	46
60.0	-20	-13	-9	9	-4	24	3	34
80.0	-22	-17	-11	7	-10	14	-3	19
100.0	-23	-18	-12	5	-14	6	-8	12
120.0	-24	-20	-11	5	-15	2	-12	7
150.0	-22	-17	-8	12	-15	2	-10	5
180.0	-24	-22	-9	11	-18	-2	-13	-3
200.0	-26	-21	-7	11	-20	-3	-14	-2
Average	-21	-20	-13	-4	-9	14	-2	18
Minimum	-26	-34	-23	-26	-20	-3	-14	-3
Maximum	-16	-7	-7	15	3	37	12	48

Overall	90°Lag	30°Lag
Average	-11	2
Minimum	-26	-34
Maximum	12	48

Calibration Report

RD-33-234 Dytronic Portable Standard

	Function.....VA-hour RMS	60 Hz	Phase A
Date.....	22-Jun-17	Uncertainty at Unity.....	16
Serial Number.....	3XXXXX	Uncertainty at 60° Phase Angle....	22

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 VA-hour calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 2 seconds and stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in $\mu\text{VAh}/\text{VAh}$. The Automated Calibration System has at least a 2 times greater accuracy than the instrument under test. The results presented on this page are compliant with ANSI/NCSS Z540-1-1994 and accredited to ISO/IEC 17025:2005.

Voltage & Phase Angle

Amps	120 Unity	120 60°Lag	240 Unity	240 60°Lag	480 Unity	480 60°Lag	600 Unity	600 60°Lag
0.2	-1	-1	-4	-1	-10	-3	-1	8
0.25	-12	-12	-13	-11	-19	-14	-10	-3
0.3	-12	-12	-13	-12	-19	-15	-10	-5
0.5	-13	-14	-14	-13	-20	-15	-12	-4
1.0	-12	-13	-14	-12	-19	-14	-10	-3
2.0	-11	-12	-13	-11	-18	-13	-10	-3
2.5	-12	-12	-14	-12	-19	-15	-10	-5
3.0	-5	-5	-7	-4	-12	-5	-4	6
4.0	-9	-9	-10	-9	-16	-11	-8	0
5.0	-12	-12	-13	-11	-19	-15	-10	-4
7.0	-23	-23	-24	-22	-30	-24	-21	-13
10.0	-9	-11	-11	-9	-16	-13	-7	-2
15.0	-9	-10	-10	-8	-16	-11	-8	0
20.0	-9	-10	-9	-8	-16	-12	-7	-2
25.0	-2	-3	-2	1	-9	-2	0	9
30.0	-2	-4	-3	0	-10	-4	-1	6
35.0	-4	-6	-5	-2	-12	-8	-3	3
40.0	-7	-9	-8	-5	-15	-11	-6	-1
45.0	-7	-9	-8	-5	-15	-11	-7	-2
50.0	-5	-7	-5	-1	-13	-6	-5	4
60.0	-5	-8	-6	-2	-14	-8	-6	2
80.0	-6	-10	-6	-2	-14	-10	-5	0
100.0	-6	-12	-6	-2	-15	-12	-7	-3
120.0	-6	-12	-6	-1	-15	-13	-7	-4
150.0	4	-4	4	9	-5	-5	3	4
180.0	3	-7	2	8	-8	-8	0	1
200.0	9	-2	8	14	-2	-3	6	6
Average	-7	-9	-8	-5	-15	-10	-6	0
Minimum	-23	-23	-24	-22	-30	-24	-21	-13
Maximum	9	-1	8	14	-2	-2	6	9

Overall	Unity	60°Lag
Average	-9	-6
Minimum	-30	-24
Maximum	9	14

Calibration Report

RD-33-234 Dytronic Portable Standard

	Function.....VA-hour RMS	60 Hz	Phase B
Date.....	22-Jun-17	Uncertainty at Unity.....	16
Serial Number.....	3XXXXX	Uncertainty at 60° Phase Angle....	22

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 VA-hour calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 2 seconds and stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in μ VAh/VAh. The Automated Calibration System has at least a 2 times greater accuracy than the instrument under test. The results presented on this page are compliant with ANSI/NCSS Z540-1-1994 and accredited to ISO/IEC 17025:2005.

Voltage & Phase Angle

Amps	120 Unity	120 60°Lag	240 Unity	240 60°Lag	480 Unity	480 60°Lag	600 Unity	600 60°Lag
0.2	-42	-31	-46	-24	-46	-7	-44	4
0.25	-42	-31	-43	-25	-45	-12	-41	1
0.3	-41	-32	-42	-27	-43	-17	-39	-5
0.5	-36	-25	-36	-18	-39	-6	-35	4
1.0	-33	-23	-34	-16	-37	-4	-32	7
2.0	-29	-19	-30	-12	-32	-1	-28	11
2.5	-32	-24	-33	-18	-36	-10	-31	1
3.0	-43	-32	-44	-22	-46	-6	-42	8
4.0	-47	-38	-47	-31	-50	-19	-46	-8
5.0	-50	-43	-50	-37	-53	-28	-49	-18
7.0	-29	-21	-30	-12	-33	1	-29	14
10.0	-30	-24	-30	-17	-33	-9	-29	1
15.0	-30	-22	-30	-13	-33	-2	-30	10
20.0	-27	-22	-27	-14	-31	-6	-27	3
25.0	-35	-27	-35	-15	-39	-2	-36	11
30.0	-37	-31	-37	-20	-41	-10	-38	2
35.0	-39	-34	-39	-24	-44	-17	-40	-6
40.0	-42	-37	-42	-27	-47	-22	-42	-12
45.0	-42	-38	-42	-29	-47	-25	-43	-16
50.0	-33	-25	-32	-11	-38	0	-34	13
60.0	-33	-27	-33	-14	-39	-7	-35	5
80.0	-33	-29	-32	-15	-38	-13	-34	-4
100.0	-33	-31	-32	-16	-39	-18	-35	-11
120.0	-32	-30	-31	-14	-38	-20	-35	-13
150.0	-26	-27	-26	-10	-34	-20	-31	-14
180.0	-27	-28	-27	-9	-35	-22	-32	-17
200.0	-28	-31	-30	-12	-38	-27	-35	-22
Average	-35	-29	-35	-19	-40	-12	-36	-2
Minimum	-50	-43	-50	-37	-53	-28	-49	-22
Maximum	-26	-19	-26	-9	-31	1	-27	14

Overall	Unity	60°Lag
Average	-37	-15
Minimum	-53	-43
Maximum	-26	14

Calibration Report

RD-33-234 Dytronic Portable Standard

	Function.....VA-hour RMS	60 Hz	Phase C
Date.....	22-Jun-17	Uncertainty at Unity.....	16
Serial Number.....	3XXXXX	Uncertainty at 60° Phase Angle....	22

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 VA-hour calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 2 seconds and stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in $\mu\text{VAh}/\text{VAh}$. The Automated Calibration System has at least a 2 times greater accuracy than the instrument under test. The results presented on this page are compliant with ANSI/NCSL Z540-1-1994 and accredited to ISO/IEC 17025:2005.

Voltage & Phase Angle

Amps	120 Unity	120 60°Lag	240 Unity	240 60°Lag	480 Unity	480 60°Lag	600 Unity	600 60°Lag
0.2	-25	-21	-26	-16	-23	-3	-26	0
0.25	-18	-17	-19	-13	-19	-2	-20	1
0.3	-19	-18	-20	-15	-18	-6	-20	-4
0.5	-21	-18	-21	-14	-20	-4	-22	-1
1.0	-21	-18	-21	-14	-20	-3	-22	-1
2.0	-20	-17	-21	-13	-20	-3	-22	0
2.5	-20	-17	-20	-14	-19	-6	-21	-4
3.0	-17	-13	-18	-7	-17	6	-18	11
4.0	-17	-15	-18	-10	-17	0	-19	3
5.0	-20	-18	-20	-14	-19	-6	-21	-4
7.0	-17	-14	-17	-9	-16	3	-19	6
10.0	-20	-18	-21	-15	-20	-7	-21	-5
15.0	-18	-15	-18	-10	-17	0	-20	3
20.0	-20	-18	-20	-13	-19	-6	-21	-4
25.0	-17	-13	-17	-6	-16	5	-18	9
30.0	-16	-13	-16	-7	-15	2	-17	5
35.0	-17	-15	-17	-10	-16	-2	-18	0
40.0	-20	-18	-20	-13	-19	-6	-20	-5
45.0	-19	-17	-19	-13	-18	-7	-20	-5
50.0	-18	-15	-19	-7	-17	3	-19	7
60.0	-19	-16	-19	-9	-18	-1	-20	2
80.0	-19	-19	-20	-13	-19	-7	-20	-5
100.0	-18	-20	-19	-14	-17	-10	-19	-9
120.0	-18	-20	-19	-15	-17	-11	-19	-11
150.0	-15	-21	-18	-16	-15	-14	-17	-14
180.0	-15	-23	-20	-19	-15	-17	-18	-17
200.0	-20	-30	-26	-27	-21	-25	-23	-25
Average	-19	-18	-20	-13	-18	-5	-20	-3
Minimum	-25	-30	-26	-27	-23	-25	-26	-25
Maximum	-15	-13	-16	-6	-15	6	-17	11

Overall	Unity	60°Lag
Average	-19	-9
Minimum	-26	-30
Maximum	-15	11

Calibration Report

RD-33-234 Dytronic Portable Standard

	Function.....VA-hour RMS	60 Hz	Total
Date.....	22-Jun-17	Uncertainty at Unity.....	22
Serial Number.....	3XXXXX	Uncertainty at 60° Phase Angle....	35

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 VA-hour calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 2 seconds and stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in $\mu\text{VAh}/\text{VAh}$. The Automated Calibration System has at least a 2 times greater accuracy than the instrument under test. The results presented on this page are compliant with ANSI/NCSS Z540-1-1994 and accredited to ISO/IEC 17025:2005.

Voltage & Phase Angle

	120 Unity	120 60°Lag	240 Unity	240 60°Lag	480 Unity	480 60°Lag	600 Unity	600 60°Lag
Amps								
0.2	-23	-18	-25	-14	-26	-5	-24	4
0.25	-24	-20	-25	-16	-28	-9	-23	-1
0.3	-24	-21	-25	-18	-27	-13	-23	-5
0.5	-24	-19	-24	-15	-27	-9	-23	-1
1.0	-22	-18	-23	-14	-25	-7	-22	1
2.0	-20	-16	-21	-12	-23	-6	-20	3
2.5	-21	-18	-22	-15	-25	-10	-21	-3
3.0	-22	-17	-23	-11	-25	-1	-22	8
4.0	-24	-21	-25	-17	-28	-10	-24	-2
5.0	-27	-24	-28	-21	-30	-16	-26	-9
7.0	-23	-19	-24	-15	-26	-7	-23	2
10.0	-20	-17	-20	-14	-23	-9	-19	-2
15.0	-19	-16	-19	-10	-22	-4	-19	4
20.0	-19	-17	-19	-12	-22	-8	-18	-1
25.0	-18	-14	-18	-7	-21	0	-18	10
30.0	-18	-16	-19	-9	-22	-4	-19	4
35.0	-20	-18	-20	-12	-24	-9	-21	-1
40.0	-23	-22	-23	-15	-27	-13	-23	-6
45.0	-23	-22	-23	-15	-27	-15	-23	-8
50.0	-19	-16	-19	-6	-23	-1	-19	8
60.0	-19	-17	-19	-8	-24	-5	-20	3
80.0	-19	-19	-19	-10	-24	-10	-20	-3
100.0	-19	-21	-19	-10	-24	-13	-21	-8
120.0	-19	-21	-19	-10	-24	-15	-20	-10
150.0	-12	-17	-14	-6	-18	-13	-15	-8
180.0	-13	-19	-15	-7	-19	-16	-17	-11
200.0	-13	-21	-16	-9	-20	-18	-17	-14
Average	-20	-19	-21	-12	-24	-9	-21	-2
Minimum	-27	-24	-28	-21	-30	-18	-26	-14
Maximum	-12	-14	-14	-6	-18	0	-15	10

Overall	Unity	60°Lag
Average	-22	-10
Minimum	-30	-24
Maximum	-12	10

Calibration Report

RD-33-234 Dytronic Portable Standard

	Function.....	VA RMS 60 Hz	Phase A
Date.....	22-Jun-17	Uncertainty at Unity.....	16
Serial Number.....	3XXXXX	Uncertainty at 60° Phase Angle....	22

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 VA calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 2 seconds and stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in $\mu\text{VA}/\text{VA}$. The Automated Calibration System has at least a 2 times greater accuracy than the instrument under test. The results presented on this page are compliant with ANSI/NCCL Z540-1-1994 and accredited to ISO/IEC 17025:2005.

Voltage & Phase Angle

	120 Unity	120 60°Lag	240 Unity	240 60°Lag	480 Unity	480 60°Lag	600 Unity	600 60°Lag
Amps								
0.2	-1	-1	-4	-1	-10	-3	-1	8
0.25	-11	-12	-12	-11	-19	-13	-9	-3
0.3	-12	-12	-13	-13	-19	-14	-10	-4
0.5	-13	-14	-15	-13	-20	-15	-11	-5
1.0	-12	-12	-14	-12	-19	-14	-10	-3
2.0	-11	-12	-13	-11	-18	-13	-9	-2
2.5	-12	-12	-13	-12	-19	-15	-10	-4
3.0	-5	-5	-6	-4	-12	-4	-4	7
4.0	-8	-9	-10	-8	-16	-10	-7	0
5.0	-11	-12	-13	-11	-19	-15	-9	-4
7.0	-23	-23	-24	-22	-30	-24	-21	-13
10.0	-10	-11	-11	-10	-16	-13	-8	-2
15.0	-9	-10	-11	-8	-16	-11	-8	0
20.0	-9	-10	-9	-8	-16	-12	-7	-2
25.0	-1	-2	-3	1	-9	-2	0	9
30.0	-2	-4	-4	0	-10	-4	-2	6
35.0	-4	-6	-5	-2	-12	-7	-3	3
40.0	-7	-9	-8	-5	-15	-11	-6	0
45.0	-7	-9	-8	-5	-16	-11	-6	-2
50.0	-5	-7	-5	-1	-13	-6	-5	5
60.0	-5	-7	-6	-2	-14	-8	-6	2
80.0	-6	-10	-6	-1	-14	-10	-6	0
100.0	-6	-12	-6	-2	-15	-12	-6	-3
120.0	-5	-11	-6	0	-15	-13	-6	-4
150.0	5	-4	4	9	-5	-5	3	4
180.0	3	-7	2	8	-7	-8	0	1
200.0	9	-1	8	14	-2	-2	6	6
Average	-7	-9	-8	-5	-15	-10	-6	0
Minimum	-23	-23	-24	-22	-30	-24	-21	-13
Maximum	9	-1	8	14	-2	-2	6	9

<u>Overall</u>	Unity	60°Lag
Average	-9	-6
Minimum	-30	-24
Maximum	9	14

Calibration Report

RD-33-234 Dytronic Portable Standard

	Function.....	VA RMS 60 Hz	Phase B
Date.....	22-Jun-17	Uncertainty at Unity.....	16
Serial Number.....	3XXXXX	Uncertainty at 60° Phase Angle....	22

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 VA calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 2 seconds and stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in $\mu\text{VA}/\text{VA}$. The Automated Calibration System has at least a 2 times greater accuracy than the instrument under test. The results presented on this page are compliant with ANSI/NCSL Z540-1-1994 and accredited to ISO/IEC 17025:2005.

Voltage & Phase Angle

	120 Unity	120 60°Lag	240 Unity	240 60°Lag	480 Unity	480 60°Lag	600 Unity	600 60°Lag
Amps								
0.2	-42	-31	-46	-24	-45	-7	-44	5
0.25	-42	-31	-42	-25	-45	-12	-40	1
0.3	-41	-31	-41	-27	-43	-18	-39	-5
0.5	-37	-25	-36	-18	-39	-7	-35	5
1.0	-33	-23	-33	-16	-36	-4	-32	7
2.0	-29	-19	-29	-12	-32	-1	-28	11
2.5	-32	-24	-32	-18	-35	-10	-31	1
3.0	-43	-31	-43	-22	-46	-6	-42	9
4.0	-47	-38	-47	-31	-50	-19	-46	-8
5.0	-50	-43	-49	-37	-53	-28	-49	-18
7.0	-30	-21	-30	-12	-32	1	-29	14
10.0	-30	-24	-30	-17	-33	-9	-28	1
15.0	-30	-22	-30	-13	-33	-2	-30	10
20.0	-27	-21	-27	-14	-31	-6	-27	3
25.0	-35	-27	-35	-15	-39	-2	-35	12
30.0	-37	-31	-37	-19	-41	-10	-38	2
35.0	-39	-34	-39	-24	-44	-16	-40	-6
40.0	-41	-37	-42	-27	-46	-22	-42	-12
45.0	-42	-38	-42	-28	-47	-25	-43	-16
50.0	-32	-25	-32	-11	-38	0	-34	13
60.0	-33	-27	-33	-14	-39	-6	-35	5
80.0	-32	-28	-32	-14	-38	-13	-34	-4
100.0	-33	-31	-32	-16	-39	-18	-35	-11
120.0	-31	-30	-30	-14	-38	-20	-35	-13
150.0	-27	-26	-26	-10	-34	-19	-30	-14
180.0	-26	-28	-27	-9	-35	-22	-32	-17
200.0	-28	-31	-29	-12	-38	-27	-34	-22
Average	-35	-29	-35	-18	-40	-12	-36	-2
Minimum	-50	-43	-49	-37	-53	-28	-49	-22
Maximum	-26	-19	-26	-9	-31	1	-27	14

Overall	Unity	60°Lag
Average	-36	-15
Minimum	-53	-43
Maximum	-26	14

Calibration Report

RD-33-234 Dytronic Portable Standard

	Function.....	VA RMS 60 Hz	Phase C
Date.....	22-Jun-17	Uncertainty at Unity.....	16
Serial Number.....	3XXXXX	Uncertainty at 60° Phase Angle....	22

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 VA calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 2 seconds and stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in $\mu\text{VA}/\text{VA}$. The Automated Calibration System has at least a 2 times greater accuracy than the instrument under test. The results presented on this page are compliant with ANSI/NCSL Z540-1-1994 and accredited to ISO/IEC 17025:2005.

Voltage & Phase Angle

	120 Unity	120 60°Lag	240 Unity	240 60°Lag	480 Unity	480 60°Lag	600 Unity	600 60°Lag
Amps								
0.2	-25	-21	-26	-16	-23	-3	-26	0
0.25	-18	-17	-19	-13	-18	-2	-19	2
0.3	-19	-18	-19	-15	-17	-6	-20	-4
0.5	-21	-18	-21	-14	-20	-4	-22	-1
1.0	-21	-18	-21	-14	-21	-3	-23	-1
2.0	-20	-17	-20	-13	-19	-3	-22	0
2.5	-19	-17	-20	-14	-19	-6	-21	-4
3.0	-17	-13	-18	-7	-16	6	-18	11
4.0	-17	-15	-17	-10	-17	0	-19	3
5.0	-20	-18	-20	-14	-19	-6	-21	-4
7.0	-17	-14	-17	-9	-16	3	-19	6
10.0	-20	-18	-20	-15	-19	-7	-21	-5
15.0	-18	-15	-18	-10	-17	0	-20	3
20.0	-20	-18	-20	-13	-19	-6	-20	-4
25.0	-17	-13	-17	-6	-16	5	-18	9
30.0	-16	-13	-16	-7	-15	2	-17	5
35.0	-17	-15	-16	-10	-16	-2	-18	1
40.0	-19	-18	-20	-13	-19	-6	-20	-4
45.0	-19	-17	-19	-13	-18	-7	-20	-5
50.0	-18	-15	-18	-7	-18	4	-19	7
60.0	-19	-16	-19	-9	-18	-1	-20	2
80.0	-18	-19	-20	-13	-18	-7	-20	-5
100.0	-18	-20	-19	-14	-17	-10	-20	-9
120.0	-18	-20	-20	-15	-17	-12	-19	-11
150.0	-15	-21	-18	-16	-15	-14	-17	-14
180.0	-15	-23	-20	-19	-15	-17	-18	-17
200.0	-20	-30	-26	-27	-21	-24	-22	-25
Average	-18	-18	-19	-13	-18	-5	-20	-2
Minimum	-25	-30	-26	-27	-23	-24	-26	-25
Maximum	-15	-13	-16	-6	-15	6	-17	11

Overall	Unity	60°Lag
Average	-19	-9
Minimum	-26	-30
Maximum	-15	11

Calibration Report

RD-33-234 Dytronic Portable Standard

	Function.....	VA RMS 60 Hz	Total
Date.....	22-Jun-17	Uncertainty at Unity.....	22
Serial Number.....	3XXXXX	Uncertainty at 60° Phase Angle....	35

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 VA calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 2 seconds and stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in $\mu\text{VA}/\text{VA}$. The Automated Calibration System has at least a 2 times greater accuracy than the instrument under test. The results presented on this page are compliant with ANSI/NCCL Z540-1-1994 and accredited to ISO/IEC 17025:2005.

Voltage & Phase Angle

	120 Unity	120 60°Lag	240 Unity	240 60°Lag	480 Unity	480 60°Lag	600 Unity	600 60°Lag
Amps								
0.2	-23	-18	-25	-14	-26	-5	-24	4
0.25	-23	-20	-25	-16	-27	-9	-23	0
0.3	-24	-21	-25	-18	-27	-13	-22	-4
0.5	-24	-19	-24	-15	-27	-9	-23	0
1.0	-22	-18	-23	-14	-25	-7	-22	1
2.0	-20	-16	-21	-12	-23	-5	-19	3
2.5	-21	-18	-22	-15	-24	-10	-20	-3
3.0	-22	-16	-23	-11	-25	-1	-21	8
4.0	-24	-21	-25	-17	-27	-10	-24	-2
5.0	-27	-24	-28	-21	-30	-16	-26	-9
7.0	-24	-19	-24	-14	-26	-7	-23	2
10.0	-20	-18	-20	-14	-23	-9	-20	-2
15.0	-19	-16	-20	-10	-22	-4	-19	4
20.0	-18	-16	-19	-12	-22	-8	-18	-1
25.0	-18	-14	-18	-7	-21	0	-18	10
30.0	-18	-16	-19	-9	-22	-4	-19	4
35.0	-20	-18	-21	-12	-24	-9	-20	-1
40.0	-22	-21	-23	-15	-27	-13	-23	-6
45.0	-23	-22	-23	-15	-27	-15	-23	-8
50.0	-19	-16	-18	-6	-23	-1	-20	8
60.0	-19	-17	-20	-8	-24	-5	-20	3
80.0	-19	-19	-19	-10	-23	-10	-20	-3
100.0	-19	-21	-19	-10	-24	-13	-21	-7
120.0	-18	-21	-19	-10	-23	-15	-20	-9
150.0	-12	-17	-13	-5	-18	-13	-15	-8
180.0	-12	-19	-15	-7	-20	-15	-17	-11
200.0	-13	-21	-16	-9	-20	-18	-17	-14
Average	-20	-19	-21	-12	-24	-9	-21	-1
Minimum	-27	-24	-28	-21	-30	-18	-26	-14
Maximum	-12	-14	-13	-5	-18	0	-15	10

Overall	Unity	60°Lag
Average	-21	-10
Minimum	-30	-24
Maximum	-12	10

Calibration Report

RD-33-234 Dytronic Portable Standard

Function..... Q-hour 60 Hz Phase A
Date..... 22-Jun-17
Serial Number..... 3XXXXX

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 Q-hour calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 2 seconds and the stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in $\mu\text{Qh}/\text{Qh}$. The RS-933 has at least a 2 times greater accuracy than the Instrument under test. The results presented on this page are compliant with ANSI/NC SL Z540-1-1994. They are not within Radian 's 17025 Scope of Accreditation.

Voltage & Phase Angle

Amps	120 Unity	120 60°Lag	240 Unity	240 60°Lag	480 Unity	480 60°Lag	600 Unity	600 60°Lag
0.2	16	0	17	0	26	-2	33	8
0.25	-6	-11	-3	-11	4	-13	15	-3
0.3	-8	-11	-5	-11	1	-13	11	-5
0.5	-12	-13	-9	-12	-1	-15	9	-4
1.0	-19	-12	-16	-11	-8	-13	2	-3
2.0	-18	-11	-15	-10	-7	-12	3	-2
2.5	-17	-11	-14	-11	-8	-13	1	-5
3.0	-4	-5	-1	-3	9	-4	18	6
4.0	-13	-8	-10	-8	-3	-10	7	0
5.0	-15	-11	-12	-10	-6	-13	3	-4
7.0	-35	-23	-30	-21	-22	-23	-12	-13
10.0	-12	-9	-8	-8	-3	-11	6	-2
15.0	-10	-9	-4	-7	2	-10	12	0
20.0	-11	-9	-4	-6	-2	-11	7	-2
25.0	0	-2	8	1	13	-2	22	9
30.0	-3	-3	5	1	8	-3	18	7
35.0	-5	-5	3	-2	5	-7	13	3
40.0	-9	-8	2	-4	1	-9	10	-1
45.0	-7	-7	3	-3	2	-10	8	-2
50.0	-5	-7	8	-1	9	-6	17	5
60.0	-9	-7	6	-1	4	-7	12	2
80.0	-11	-8	8	0	2	-9	9	0
100.0	-13	-11	9	-1	-1	-12	4	-3
120.0	-15	-11	9	0	-4	-12	2	-4
150.0	-6	-3	21	10	5	-4	10	4
180.0	-10	-6	21	9	2	-6	4	1
200.0	-2	-1	31	14	10	-2	12	6
Average	-10	-8	1	-4	1	-9	9	0
Minimum	-35	-23	-30	-21	-22	-23	-12	-13
Maximum	16	0	31	14	26	-2	33	9

	60°Lag	Unity
Average	0	-5
Minimum	-35	-23
Maximum	33	14

Calibration Report

RD-33-234 Dytronic Portable Standard

Function..... Q-hour 60 Hz Phase B
Date..... 22-Jun-17
Serial Number..... 3XXXXX

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 Q-hour calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 2 seconds and the stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in $\mu\text{Qh/Qh}$. The RS-933 has at least a 2 times greater accuracy than the Instrument under test. The results presented on this page are compliant with ANSI/NC SL Z540-1-1994. They are not within Radian 's 17025 Scope of Accreditation.

Voltage & Phase Angle

Amps	120 Unity	120 60°Lag	240 Unity	240 60°Lag	480 Unity	480 60°Lag	600 Unity	600 60°Lag
0.2	-58	-31	-38	-24	-2	-7	15	4
0.25	-57	-30	-38	-24	-11	-11	1	1
0.3	-57	-31	-42	-25	-20	-16	-9	-6
0.5	-49	-24	-35	-17	-7	-6	7	5
1.0	-47	-22	-33	-15	-7	-3	9	8
2.0	-38	-18	-23	-11	3	0	19	12
2.5	-42	-23	-30	-17	-10	-8	4	1
3.0	-36	-31	-16	-22	19	-5	39	9
4.0	-49	-37	-33	-30	-7	-19	9	-7
5.0	-54	-41	-41	-35	-20	-27	-8	-18
7.0	-27	-20	-7	-11	22	2	40	14
10.0	-25	-22	-11	-16	8	-7	21	1
15.0	-15	-21	4	-12	30	-1	46	11
20.0	-15	-20	2	-12	19	-5	32	3
25.0	-13	-26	12	-15	41	-1	58	12
30.0	-20	-30	2	-19	25	-9	41	2
35.0	-25	-33	-4	-23	14	-16	27	-6
40.0	-29	-36	-8	-26	5	-21	17	-13
45.0	-29	-37	-8	-27	1	-24	11	-16
50.0	-15	-25	15	-10	40	1	56	13
60.0	-21	-26	8	-13	25	-6	40	5
80.0	-21	-27	9	-13	14	-12	26	-4
100.0	-22	-31	9	-15	6	-18	12	-11
120.0	-23	-29	9	-13	1	-19	8	-13
150.0	-16	-25	19	-8	3	-18	6	-14
180.0	-15	-26	22	-8	0	-21	1	-17
200.0	-16	-31	22	-12	-3	-27	-3	-22
Average	-31	-28	-9	-18	7	-11	19	-2
Minimum	-58	-41	-42	-35	-20	-27	-9	-22
Maximum	-13	-18	22	-8	41	2	58	14

	60°Lag	Unity
Average	-3	-15
Minimum	-58	-41
Maximum	58	14

Calibration Report

RD-33-234 Dytronic Portable Standard

Function..... Q-hour 60 Hz Phase C
Date..... 22-Jun-17
Serial Number..... 3XXXXX

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 Q-hour calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 2 seconds and the stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in $\mu\text{Qh/Qh}$. The RS-933 has at least a 2 times greater accuracy than the Instrument under test. The results presented on this page are compliant with ANSI/NC SL Z540-1-1994. They are not within Radian 's 17025 Scope of Accreditation.

Voltage & Phase Angle

	120 Unity	120 60°Lag	240 Unity	240 60°Lag	480 Unity	480 60°Lag	600 Unity	600 60°Lag
Amps								
0.2	-40	-21	-27	-16	2	-2	1	0
0.25	-41	-16	-30	-12	-10	-1	-10	2
0.3	-44	-17	-34	-14	-17	-5	-18	-4
0.5	-46	-17	-36	-13	-15	-3	-14	-1
1.0	-46	-17	-35	-13	-16	-3	-14	0
2.0	-37	-16	-26	-12	-7	-2	-5	0
2.5	-36	-16	-27	-13	-11	-4	-11	-4
3.0	-16	-12	-1	-7	24	7	27	10
4.0	-24	-14	-13	-9	6	1	8	3
5.0	-26	-16	-17	-13	-1	-5	-1	-4
7.0	-29	-13	-15	-8	6	3	9	6
10.0	-16	-17	-7	-13	8	-5	8	-5
15.0	-11	-14	2	-9	21	1	23	3
20.0	-15	-16	-4	-12	10	-5	11	-5
25.0	-8	-13	8	-6	31	5	32	9
30.0	-11	-12	3	-6	21	3	23	6
35.0	-14	-14	-1	-9	15	-1	15	1
40.0	-16	-17	-3	-11	9	-5	9	-5
45.0	-15	-16	-3	-11	9	-6	6	-5
50.0	-2	-14	16	-7	37	4	38	7
60.0	-8	-15	9	-8	25	0	27	2
80.0	-16	-17	-1	-11	9	-5	9	-6
100.0	-15	-20	-1	-13	7	-9	3	-9
120.0	-17	-19	-4	-14	2	-11	-1	-11
150.0	-18	-20	-6	-15	-2	-13	-6	-14
180.0	-21	-21	-10	-17	-8	-15	-14	-17
200.0	-26	-29	-17	-27	-13	-24	-20	-25
Average	-23	-17	-10	-12	5	-4	5	-2
Minimum	-46	-29	-36	-27	-17	-24	-20	-25
Maximum	-2	-12	16	-6	37	7	38	10

	60°Lag	Unity
Average	-6	-9
Minimum	-46	-29
Maximum	38	10

Calibration Report

RD-33-234 Dytronic Portable Standard

Function..... Volts RMS 60 Hz **Phase A**
Date..... 22-Jun-17
Serial Number..... 3XXXXX

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 Volt calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 2 seconds and the stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in $\mu\text{V/V}$. The RS-933 has at least a 2 times greater accuracy than the Instrument under test. The results presented on this page are compliant with ANSI/NC SL Z540-1-1994. They are not within Radian 's 17025 Scope of Accreditation.

Voltage	
	V RMS
60	-2
80	-6
100	-2
120	-1
140	-4
160	-8
180	-5
200	-4
220	-2
240	-2
260	-3
280	-2
300	-18
320	-18
340	-16
360	-14
380	-12
400	-12
420	-10
440	-9
460	-9
480	-8
500	-7
520	-6
540	-4
560	-3
580	-1
600	0
Average	-7
Minimum	-18
Maximum	0

Calibration Report

RD-33-234 Dytronic Portable Standard

Function..... Volts RMS 60 Hz **Phase B**
Date..... 22-Jun-17
Serial Number..... 3XXXXX

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 Volt calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 2 seconds and the stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in $\mu\text{V/V}$. The RS-933 has at least a 2 times greater accuracy than the Instrument under test. The results presented on this page are compliant with ANSI/NC SL Z540-1-1994. They are not within Radian 's 17025 Scope of Accreditation.

Voltage
V RMS

60	1
80	11
100	5
120	-1
140	6
160	3
180	0
200	6
220	3
240	-1
260	4
280	0
300	-1
320	0
340	-2
360	-4
380	-4
400	-1
420	-2
440	-3
460	-1
480	-3
500	-3
520	-1
540	-1
560	-2
580	2
600	2
Average	0
Minimum	-4
Maximum	11

Calibration Report

RD-33-234 Dytronic Portable Standard

Function..... Volts RMS 60 Hz **Phase C**
Date..... 22-Jun-17
Serial Number..... 3XXXXX

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 Volt calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 2 seconds and the stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in $\mu\text{V/V}$. The RS-933 has at least a 2 times greater accuracy than the Instrument under test. The results presented on this page are compliant with ANSI/NC SL Z540-1-1994. They are not within Radian 's 17025 Scope of Accreditation.

Voltage

	V RMS
60	-3
80	16
100	7
120	-2
140	6
160	6
180	0
200	7
220	2
240	-2
260	1
280	-3
300	8
320	9
340	6
360	4
380	2
400	5
420	3
440	1
460	1
480	0
500	-2
520	-1
540	-2
560	-3
580	-1
600	-2
Average	2
Minimum	-3
Maximum	16

Calibration Report

RD-33-234 Dytronic Portable Standard

Function..... **Amps RMS 60 Hz** **Phase A**
Date..... **22-Jun-17**
Serial Number..... **3XXXXX**

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 Amp calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 2 seconds and the stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in μ A/A. The RS-933 has at least a 2 times greater accuracy than the Instrument under test. The results presented on this page are compliant with ANSI/NC SL Z540-1-1994. They are not within Radian 's 17025 Scope of Accreditation.

Amps	A RMS
0.2	-5
0.25	-13
0.3	-13
0.5	-15
1.0	-14
2.0	-13
2.5	-13
3.0	-7
4.0	-10
5.0	-13
7.0	-25
10.0	-11
15.0	-11
20.0	-11
25.0	-4
30.0	-6
35.0	-7
40.0	-10
45.0	-11
50.0	-9
60.0	-10
80.0	-9
100.0	-11
120.0	-11
150.0	-1
180.0	-4
200.0	1
Average	-10
Minimum	-25
Maximum	1

Calibration Report

RD-33-234 Dytronic Portable Standard

Function..... **Amps RMS 60 Hz** **Phase B**
Date..... **22-Jun-17**
Serial Number..... **3XXXXX**

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 Amp calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 2 seconds and the stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in $\mu A/A$. The RS-933 has at least a 2 times greater accuracy than the Instrument under test. The results presented on this page are compliant with ANSI/NCSL Z540-1-1994. They are not within Radian 's 17025 Scope of Accreditation.

Amps	A RMS
0.2	-43
0.25	-42
0.3	-40
0.5	-36
1.0	-33
2.0	-29
2.5	-32
3.0	-43
4.0	-47
5.0	-50
7.0	-30
10.0	-30
15.0	-30
20.0	-28
25.0	-36
30.0	-39
35.0	-41
40.0	-43
45.0	-44
50.0	-35
60.0	-36
80.0	-35
100.0	-37
120.0	-36
150.0	-33
180.0	-34
200.0	-37
Average	-37
Minimum	-50
Maximum	-28

Calibration Report

RD-33-234 Dytronic Portable Standard

Function..... **Amps RMS 60 Hz** **Phase C**
Date..... **22-Jun-17**
Serial Number..... **3XXXXX**

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 Amp calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 2 seconds and the stabilization time in between points is 5 seconds. For lagging power factors the current lags the voltage. All results are listed in μ A/A. The RS-933 has at least a 2 times greater accuracy than the Instrument under test. The results presented on this page are compliant with ANSI/NC SL Z540-1-1994. They are not within Radian 's 17025 Scope of Accreditation.

Amps	A RMS
0.2	-22
0.25	-18
0.3	-18
0.5	-20
1.0	-20
2.0	-20
2.5	-19
3.0	-16
4.0	-17
5.0	-19
7.0	-16
10.0	-19
15.0	-17
20.0	-19
25.0	-16
30.0	-15
35.0	-16
40.0	-18
45.0	-18
50.0	-17
60.0	-18
80.0	-17
100.0	-17
120.0	-16
150.0	-14
180.0	-14
200.0	-19
Average	-18
Minimum	-22
Maximum	-14

Calibration Report

RD-33-234 Dytronic Portable Standard

Mode..... Frequency Phase A
Date..... 22-Jun-17
Serial Number..... 3XXXXX

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 time base calibration is derived directly from a Keysight Technologies 53220A Universal Counter/Timer, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test Time is 2 seconds with a stabilization of 2 seconds in between points. All Results are listed in Hz/MHz. The RS-933 has at least a 2 times greater accuracy than the instrument under test.

The results presented on this page are compliant with ANSI/NCSL Z540-1-1994. They are not within Radian 's 17025 Scope of Accreditation.

Frequency

45	-0.20
46	-1.63
47	-0.42
48	-0.83
49	-0.61
50	-0.65
51	-0.49
52	-0.70
53	-0.54
54	-0.47
55	-0.99
56	-0.32
57	-0.91
58	-0.79
59	-0.74
60	-0.90
61	-0.84
62	-0.79
63	-0.74
64	-0.60
65	-0.45
Average	-0.70
Minimum	-1.63
Maximum	-0.20

Calibration Report

RD-33-234 Dytronic Portable Standard

Mode..... Frequency Phase B
Date..... 22-Jun-17
Serial Number..... 3XXXXX

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 time base calibration is derived directly from a Keysight Technologies 53220A Universal Counter/Timer, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test Time is 2 seconds with a stabilization of 2 seconds in between points. All Results are listed in Hz/MHz. The RS-933 has at least a 2 times greater accuracy than the instrument under test.

The results presented on this page are compliant with ANSI/NCSL Z540-1-1994. They are not within Radian 's 17025 Scope of Accreditation.

Frequency

45	-0.69
46	-1.23
47	-0.57
48	-1.07
49	-0.74
50	-0.70
51	-0.85
52	-0.09
53	-0.34
54	-0.54
55	-0.23
56	-0.05
57	-0.35
58	-0.08
59	-0.79
60	-0.70
61	-0.83
62	-0.72
63	-0.98
64	-0.73
65	-0.35
Average	-0.60
Minimum	-1.23
Maximum	-0.05

Calibration Report

RD-33-234 Dytronic Portable Standard

Mode..... Frequency Phase C
Date..... 22-Jun-17
Serial Number..... 3XXXXX

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 time base calibration is derived directly from a Keysight Technologies 53220A Universal Counter/Timer, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test Time is 2 seconds with a stabilization of 2 seconds in between points. All Results are listed in Hz/MHz. The RS-933 has at least a 2 times greater accuracy than the instrument under test.

The results presented on this page are compliant with ANSI/NCSL Z540-1-1994. They are not within Radian 's 17025 Scope of Accreditation.

Frequency

45	-0.66
46	0.19
47	-0.72
48	-0.82
49	-0.71
50	-0.38
51	-0.69
52	-0.34
53	-0.40
54	-0.46
55	-0.38
56	-1.16
57	-0.42
58	-1.62
59	-0.95
60	-0.84
61	-1.16
62	-0.82
63	-0.98
64	-0.36
65	-0.59
Average	-0.68
Minimum	-1.62
Maximum	0.19

Calibration Report

RD-33-234 Dytronic Portable Standard

Function..... Phase 60 Hz

Date..... 22-Jun-17 Phase A

Serial Number..... 3XXXXX

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 phase calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). The test time is 2 seconds and the stabilization time in between points is 2 seconds. For lagging power factors the current lags the voltage. All results are listed as $\mu\text{rad}/\text{rad}$. The RS933 has at least a 2 times greater accuracy than the Instrument under test. The results presented on this page are compliant with ANSI/NCSL Z540-1-1994. They are not within Radian's 17025 scope of accreditation.

Voltage & Current

	120 1	120 5	120 15	120 30	120 50	240 1	240 5	240 15	240 30	240 50	480 1	480 5	480 15	480 30	480 50
Phase															
-179.9	1	1	0	-1	-2	3	2	1	1	0	6	4	2	2	0
-150	0	0	-1	-2	-3	2	1	0	0	-1	4	3	1	1	-1
-120	0	0	-1	-1	-2	1	0	0	0	-1	2	1	0	0	-1
-90	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	-1
-60	0	0	0	0	0	-1	-1	-1	-1	-1	-3	-3	-2	-2	-1
-30	-1	-1	-1	0	0	-3	-2	-2	-2	-1	-6	-5	-3	-3	-2
0	-2	-1	-1	0	0	-3	-3	-2	-2	-1	-7	-5	-4	-3	-3
30	-1	0	0	0	0	-2	-2	-1	-1	-1	-5	-4	-3	-2	-2
60	0	0	0	0	0	-1	-1	-1	-1	0	-1	-2	-2	-1	-1
90	-1	-1	-1	-1	-2	-1	-1	-1	-1	-1	-1	-1	-1	-1	-2
120	0	-1	-1	-1	-2	1	0	0	0	-1	2	1	0	0	-1
150	1	0	-1	-1	-2	2	2	1	1	-1	5	4	2	1	0
179.9	1	1	0	-1	-2	3	2	1	1	0	6	4	2	2	0
Average	0	0	-1	-1	-1	0	0	0	0	-1	0	0	0	-1	-1
Minimum	-2	-1	-1	-2	-3	-3	-3	-2	-2	-1	-7	-5	-4	-3	-3
Maximum	1	1	0	0	0	3	2	1	1	0	6	4	2	2	0

Calibration Report

RD-33-234 Dytronic Portable Standard

Function..... Phase 60 Hz

Date..... 22-Jun-17 Phase B

Serial Number..... 3XXXXX

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 phase calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). The test time is 2 seconds and the stabilization time in between points is 2 seconds. For lagging power factors the current lags the voltage. All results are listed as $\mu\text{rad}/\text{rad}$. The RS933 has at least a 2 times greater accuracy than the Instrument under test. The results presented on this page are compliant with ANSI/NCSL Z540-1-1994. They are not within Radian's 17025 scope of accreditation.

Voltage & Current

	120 1	120 5	120 15	120 30	120 50	240 1	240 5	240 15	240 30	240 50	480 1	480 5	480 15	480 30	480 50
Phase															
-179.9	2	1	0	0	-1	4	3	2	2	1	7	5	3	3	2
-150	1	0	-1	-1	-1	3	1	1	1	0	6	4	2	2	0
-120	0	0	-1	-1	-1	1	1	0	0	0	2	2	0	0	0
-90	0	0	0	0	0	0	0	0	0	0	-1	-1	-1	-1	-1
-60	0	-1	0	0	1	-2	-1	-1	-1	-1	-4	-4	-2	-2	-2
-30	-1	-1	-1	0	0	-3	-3	-2	-2	-1	-8	-6	-4	-4	-3
0	-2	-1	-1	0	0	-4	-3	-2	-2	-2	-8	-7	-5	-4	-3
30	-1	0	0	0	1	-3	-2	-1	-1	0	-7	-5	-3	-3	-2
60	0	0	0	0	0	-1	-1	0	0	0	-4	-3	-2	-2	-1
90	0	0	-1	-1	-1	0	0	0	0	0	-1	-1	-1	-1	-1
120	1	0	-1	-1	-1	2	1	0	0	0	3	2	1	1	0
150	2	1	0	0	-1	3	3	2	2	1	6	5	3	3	1
179.9	2	1	0	0	-1	4	3	2	2	1	7	6	3	3	2
Average	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1
Minimum	-2	-1	-1	-1	-1	-4	-3	-2	-2	-2	-8	-7	-5	-4	-3
Maximum	2	1	0	0	1	4	3	2	2	1	7	6	3	3	2

Calibration Report

RD-33-234 Dytronic Portable Standard

Function..... Phase 60 Hz

Date..... 22-Jun-17 Phase C

Serial Number..... 3XXXXX

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 phase calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). The test time is 2 seconds and the stabilization time in between points is 2 seconds. For lagging power factors the current lags the voltage. All results are listed as $\mu\text{rad}/\text{rad}$. The RS933 has at least a 2 times greater accuracy than the Instrument under test. The results presented on this page are compliant with ANSI/NCSL Z540-1-1994. They are not within Radian's 17025 scope of accreditation.

Voltage & Current

	120 1	120 5	120 15	120 30	120 50	240 1	240 5	240 15	240 30	240 50	480 1	480 5	480 15	480 30	480 50
Phase															
-179.9	1	1	0	-1	-1	3	3	1	1	0	7	5	3	2	1
-150	0	0	-1	-1	-2	2	1	0	0	-2	5	4	2	1	-1
-120	0	0	-1	-1	-2	1	1	0	-1	-1	2	2	1	0	-1
-90	0	0	0	0	0	0	0	0	0	-1	0	0	0	0	0
-60	0	0	0	0	0	-1	-1	0	-1	0	-4	-3	-2	-1	-1
-30	-2	-1	0	0	1	-3	-2	-1	-1	0	-7	-5	-3	-3	-1
0	-2	-1	0	0	1	-3	-3	-1	-1	0	-8	-6	-3	-3	-1
30	-1	0	0	1	2	-3	-1	0	0	1	-6	-4	-2	-2	0
60	-1	0	0	1	1	-1	-1	0	1	1	-3	-2	-1	-1	0
90	-1	0	0	0	0	-1	0	0	0	0	-1	-1	-1	-1	-1
120	0	0	0	0	-1	1	1	0	0	0	2	2	1	0	0
150	1	1	0	0	-1	3	2	1	1	0	6	4	2	2	0
179.9	1	1	0	0	-1	3	3	1	1	0	7	5	3	2	1
Average	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum	-2	-1	-1	-1	-2	-3	-3	-1	-1	-2	-8	-6	-3	-3	-1
Maximum	1	1	0	1	2	3	3	1	1	1	7	5	3	2	1

Calibration Report

RD-33-234 Dytronic Portable Standard

Function..... Watt-hour 60 Hz Phase A
Date..... 22-Jun-17 Pulse Output
Serial Number..... 3XXXXX

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 watt-hour calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 3 seconds and the stabilization time in between points is 3 seconds. For lagging power factors the current lags the voltage. All results are listed in $\mu\text{Wh}/\text{Wh}$. The RS-933 has at least a 2 times greater accuracy than the Instrument under test. The results presented on this page are compliant with ANSI/NC SL Z540-1-1994. They are not within Radian 's 17025 Scope of Accreditation.

Voltage & Phase Angle

Amps	120 Unity	120 60°Lag	240 Unity	240 60°Lag	480 Unity	480 60°Lag	600 Unity	600 60°Lag
0.2	-1	-9	-2	-13	-9	-25	-3	-16
0.25	-11	-19	-10	-19	-16	-30	-7	-19
0.3	-11	-18	-11	-18	-16	-29	-7	-19
0.5	-13	-13	-12	-16	-18	-27	-10	-16
1.0	-12	-6	-12	-7	-18	-19	-9	-8
2.0	-10	-3	-10	-4	-15	-16	-7	-5
2.5	-10	-4	-10	-5	-16	-17	-7	-6
3.0	-3	0	-3	0	-9	-12	-3	-3
4.0	-7	0	-8	-2	-14	-14	-6	-3
5.0	-10	-3	-10	-3	-16	-16	-7	-5
7.0	-24	-7	-23	-7	-30	-19	-22	-9
10.0	-12	-2	-11	-2	-17	-14	-8	-4
15.0	-12	-4	-13	-4	-19	-17	-10	-7
20.0	-8	1	-7	0	-14	-13	-5	-3
25.0	1	10	1	10	-5	-5	0	3
30.0	-6	6	-6	6	-13	-8	-5	1
35.0	-3	4	-3	4	-11	-11	-2	0
40.0	-5	3	-6	4	-13	-12	-5	-1
45.0	-8	2	-9	2	-17	-14	-10	-5
50.0	-3	5	-4	6	-12	-11	-6	-2
60.0	-7	1	-7	1	-14	-12	-5	-2
80.0	-6	6	-6	7	-14	-11	-5	0
100.0	-6	6	-5	8	-15	-10	-9	-3
120.0	-7	10	-6	11	-15	-9	-8	0
150.0	4	18	4	19	-6	-1	2	10
180.0	3	20	4	20	-7	0	-1	9
200.0	11	24	9	24	-1	4	2	12
Average	-6	1	-7	1	-14	-14	-6	-4
Minimum	-24	-19	-23	-19	-30	-30	-22	-19
Maximum	11	24	9	24	-1	4	2	12

Overall	Unity	60°Lag
Average	-8	-4
Minimum	-30	-30
Maximum	11	24

Calibration Report

RD-33-234 Dytronic Portable Standard

Function..... Watt-hour 60 Hz Phase B
Date..... 22-Jun-17 Pulse Output
Serial Number..... 3XXXXX

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 watt-hour calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 3 seconds and the stabilization time in between points is 3 seconds. For lagging power factors the current lags the voltage. All results are listed in $\mu\text{Wh}/\text{Wh}$. The RS-933 has at least a 2 times greater accuracy than the Instrument under test. The results presented on this page are compliant with ANSI/NCSL Z540-1-1994. They are not within Radian 's 17025 Scope of Accreditation.

Voltage & Phase Angle

Amps	120 Unity	120 60°Lag	240 Unity	240 60°Lag	480 Unity	480 60°Lag	600 Unity	600 60°Lag
0.2	-38	-18	-40	-18	-45	-20	-43	-22
0.25	-34	-29	-37	-25	-37	-30	-34	-24
0.3	-37	-23	-38	-28	-41	-26	-36	-21
0.5	-33	-19	-34	-19	-37	-23	-32	-16
1.0	-31	-17	-32	-17	-34	-20	-30	-14
2.0	-26	-16	-27	-16	-30	-19	-26	-13
2.5	-29	-18	-30	-18	-32	-21	-27	-15
3.0	-40	-37	-40	-37	-43	-41	-41	-37
4.0	-45	-38	-45	-38	-47	-41	-44	-35
5.0	-48	-40	-47	-39	-49	-42	-45	-37
7.0	-29	-23	-28	-22	-31	-26	-27	-20
10.0	-29	-24	-29	-23	-32	-27	-27	-21
15.0	-31	-29	-28	-29	-31	-33	-27	-28
20.0	-25	-23	-25	-22	-28	-27	-24	-22
25.0	-33	-33	-33	-32	-36	-39	-35	-34
30.0	-39	-36	-38	-35	-42	-41	-39	-36
35.0	-39	-37	-38	-35	-42	-43	-38	-37
40.0	-41	-38	-40	-36	-44	-44	-40	-37
45.0	-42	-40	-41	-38	-46	-46	-44	-41
50.0	-31	-25	-29	-23	-35	-32	-34	-28
60.0	-25	-23	-24	-23	-28	-27	-23	-21
80.0	-31	-25	-29	-22	-35	-33	-31	-27
100.0	-32	-24	-29	-22	-36	-33	-35	-29
120.0	-32	-23	-30	-20	-36	-33	-33	-28
150.0	-26	-17	-25	-14	-33	-29	-29	-23
180.0	-25	-16	-24	-15	-32	-30	-31	-26
200.0	-27	-19	-27	-19	-36	-35	-36	-31
Average	-33	-26	-33	-25	-37	-32	-34	-27
Minimum	-48	-40	-47	-39	-49	-46	-45	-41
Maximum	-25	-16	-24	-14	-28	-19	-23	-13

Overall	Unity	60°Lag
Average	-34	-28
Minimum	-49	-46
Maximum	-23	-13

Calibration Report

RD-33-234 Dytronic Portable Standard

Function..... Watt-hour 60 Hz Phase C
Date..... 22-Jun-17 Pulse Output
Serial Number..... 3XXXXX

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 watt-hour calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 3 seconds and the stabilization time in between points is 3 seconds. For lagging power factors the current lags the voltage. All results are listed in $\mu\text{Wh}/\text{Wh}$. The RS-933 has at least a 2 times greater accuracy than the Instrument under test. The results presented on this page are compliant with ANSI/NC SL Z540-1-1994. They are not within Radian 's 17025 Scope of Accreditation.

Voltage & Phase Angle

Amps	120 Unity	120 60°Lag	240 Unity	240 60°Lag	480 Unity	480 60°Lag	600 Unity	600 60°Lag
0.2	-26	14	-24	14	-24	17	-27	15
0.25	-25	13	-25	13	-23	14	-24	17
0.3	-20	17	-18	14	-17	16	-18	18
0.5	-22	19	-20	17	-19	16	-21	20
1.0	-22	18	-21	16	-20	16	-22	19
2.0	-21	9	-20	7	-19	8	-21	10
2.5	-19	9	-19	8	-18	8	-19	11
3.0	-17	-1	-16	-2	-15	-2	-19	-2
4.0	-18	2	-17	0	-16	0	-18	2
5.0	-20	-1	-19	-2	-18	-2	-19	1
7.0	-18	8	-17	7	-17	7	-19	9
10.0	-16	-7	-17	-7	-16	-8	-17	-5
15.0	-21	-11	-20	-12	-19	-13	-21	-11
20.0	-19	-10	-18	-12	-17	-11	-18	-8
25.0	-16	-6	-15	-6	-14	-7	-18	-6
30.0	-18	-6	-17	-7	-16	-7	-19	-5
35.0	-17	-8	-16	-9	-15	-9	-17	-6
40.0	-19	-8	-19	-10	-18	-9	-19	-7
45.0	-20	-11	-20	-12	-18	-12	-22	-10
50.0	-18	-20	-17	-21	-16	-21	-20	-20
60.0	-16	-10	-15	-11	-15	-11	-16	-8
80.0	-19	-8	-18	-10	-17	-9	-19	-6
100.0	-19	-12	-19	-15	-18	-14	-22	-12
120.0	-20	-13	-20	-18	-18	-15	-20	-13
150.0	-15	-11	-18	-17	-15	-14	-17	-11
180.0	-16	-11	-20	-21	-16	-14	-20	-12
200.0	-19	-17	-24	-28	-18	-20	-25	-19
Average	-19	-2	-19	-5	-17	-4	-20	-1
Minimum	-26	-20	-25	-28	-24	-21	-27	-20
Maximum	-15	19	-15	17	-14	17	-16	20

Overall	Unity	60°Lag
Average	-19	-3
Minimum	-27	-28
Maximum	-14	20

Calibration Report

RD-33-234 Dytronic Portable Standard

Function..... VAR-hour 60 Hz Phase A
Date..... 22-Jun-17 Pulse Output
Serial Number..... 3XXXXX

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 VAR-hour calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 3 seconds and the stabilization time in between points is 3 seconds. For lagging power factors the current lags the voltage. All results are listed in μ VARh/VARh. The RS-933 has at least a 2 times greater accuracy than the Instrument under test. The results presented on this page are compliant with ANSI/NC SL Z540-1-1994. They are not within Radian 's 17025 Scope of Accreditation.

Voltage & Phase Angle

Amps	120	120	240	240	480	480	600	600
	90°Lag	30°Lag	90°Lag	30°Lag	90°Lag	30°Lag	90°Lag	30°Lag
0.2	-4	1	-4	0	-5	-5	6	5
0.25	-12	-9	-10	-8	-12	-13	-2	-3
0.3	-13	-8	-12	-8	-14	-13	-4	-3
0.5	-14	-8	-14	-8	-15	-12	-5	-2
1.0	-13	-8	-12	-8	-14	-12	-4	-3
2.0	-11	-7	-10	-7	-12	-11	-1	-1
2.5	-12	-7	-12	-8	-14	-12	-4	-3
3.0	-6	0	-4	0	-4	-3	7	6
4.0	-10	-5	-8	-4	-10	-8	0	1
5.0	-12	-7	-11	-7	-14	-11	-4	-2
7.0	-25	-18	-23	-18	-24	-22	-14	-12
10.0	-13	-4	-12	-4	-15	-9	-5	0
15.0	-15	-7	-12	-6	-14	-11	-3	-2
20.0	-11	-6	-8	-5	-12	-10	-2	-1
25.0	-3	3	2	7	0	2	11	12
30.0	-9	1	-5	2	-9	-4	2	6
35.0	-7	-2	-4	0	-8	-7	2	2
40.0	-11	-3	-6	-1	-11	-8	-2	1
45.0	-15	-4	-10	-3	-15	-11	-6	-2
50.0	-10	-5	-3	-2	-8	-9	3	0
60.0	-11	-5	-8	-5	-12	-11	-2	-1
80.0	-14	-4	-4	1	-12	-8	-3	0
100.0	-17	-5	-6	0	-15	-10	-6	-2
120.0	-16	-6	-4	1	-15	-11	-6	-3
150.0	-9	4	6	11	-7	-2	1	6
180.0	-12	2	5	11	-10	-4	-2	4
200.0	-8	5	10	15	-6	-1	0	5
Average	-12	-4	-6	-2	-11	-9	-2	0
Minimum	-25	-18	-23	-18	-24	-22	-14	-12
Maximum	-3	5	10	15	0	2	11	12

<i>Overall</i>	90°Lag	30°Lag
Average	-8	-4
Minimum	-25	-22
Maximum	11	15

Calibration Report

RD-33-234 Dytronic Portable Standard

Function..... VAR-hour 60 Hz Phase B
Date..... 22-Jun-17 Pulse Output
Serial Number..... 3XXXXX

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 VAR-hour calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 3 seconds and the stabilization time in between points is 3 seconds. For lagging power factors the current lags the voltage. All results are listed in μ VARh/VARh. The RS-933 has at least a 2 times greater accuracy than the Instrument under test. The results presented on this page are compliant with ANSI/NC SL Z540-1-1994. They are not within Radian 's 17025 Scope of Accreditation.

Voltage & Phase Angle

Amps	120	120	240	240	480	480	600	600
	90°Lag	30°Lag	90°Lag	30°Lag	90°Lag	30°Lag	90°Lag	30°Lag
0.2	-34	-39	-25	-30	-6	-24	7	-15
0.25	-27	-35	-23	-33	-8	-26	4	-17
0.3	-29	-34	-27	-32	-16	-26	-4	-21
0.5	-26	-27	-21	-24	-5	-17	6	-10
1.0	-23	-26	-18	-22	-3	-16	10	-7
2.0	-19	-24	-13	-19	1	-14	14	-5
2.5	-23	-27	-20	-23	-8	-19	3	-11
3.0	-31	-35	-22	-29	-2	-21	14	-11
4.0	-38	-41	-31	-36	-17	-30	-3	-23
5.0	-42	-45	-37	-41	-26	-37	-15	-29
7.0	-21	-23	-11	-18	5	-11	19	-2
10.0	-26	-25	-19	-21	-8	-17	4	-10
15.0	-23	-25	-12	-19	2	-14	15	-6
20.0	-23	-23	-14	-18	-4	-15	7	-8
25.0	-28	-29	-14	-22	4	-16	19	-6
30.0	-34	-35	-22	-27	-8	-23	5	-15
35.0	-36	-36	-25	-30	-14	-27	-2	-20
40.0	-39	-38	-27	-31	-19	-31	-8	-23
45.0	-42	-41	-31	-34	-24	-34	-15	-27
50.0	-27	-28	-10	-20	5	-16	19	-6
60.0	-23	-23	-13	-18	-3	-15	7	-8
80.0	-31	-29	-14	-19	-9	-22	1	-15
100.0	-34	-30	-17	-20	-16	-25	-8	-19
120.0	-34	-29	-15	-19	-18	-25	-10	-20
150.0	-32	-24	-11	-14	-18	-23	-12	-19
180.0	-33	-25	-11	-14	-21	-25	-16	-21
200.0	-38	-28	-14	-16	-27	-29	-23	-27
Average	-30	-31	-19	-24	-10	-22	1	-15
Minimum	-42	-45	-37	-41	-27	-37	-23	-29
Maximum	-19	-23	-10	-14	5	-11	19	-2

Overall	90°Lag	30°Lag
Average	-14	-23
Minimum	-42	-45
Maximum	19	-2

Calibration Report

RD-33-234 Dytronic Portable Standard

Function..... VAR-hour 60 Hz Phase C
Date..... 22-Jun-17 Pulse Output
Serial Number..... 3XXXXX

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 VAR-hour calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 3 seconds and the stabilization time in between points is 3 seconds. For lagging power factors the current lags the voltage. All results are listed in μ VARh/VARh. The RS-933 has at least a 2 times greater accuracy than the Instrument under test. The results presented on this page are compliant with ANSI/NC SL Z540-1-1994. They are not within Radian 's 17025 Scope of Accreditation.

Voltage & Phase Angle

Amps	120	120	240	240	480	480	600	600
	90°Lag	30°Lag	90°Lag	30°Lag	90°Lag	30°Lag	90°Lag	30°Lag
0.2	-25	-15	-17	-9	-2	-3	2	0
0.25	-26	-19	-21	-18	-8	-10	-4	-8
0.3	-18	-19	-15	-18	-5	-11	-2	-11
0.5	-21	-17	-16	-15	-4	-8	0	-8
1.0	-21	-19	-16	-16	-4	-10	0	-9
2.0	-20	-19	-15	-17	-2	-10	1	-9
2.5	-21	-18	-17	-16	-6	-10	-3	-10
3.0	-16	-14	-8	-11	7	-2	13	0
4.0	-17	-16	-12	-13	1	-7	4	-5
5.0	-20	-18	-16	-16	-5	-11	-3	-10
7.0	-17	-15	-11	-11	3	-4	8	-3
10.0	-19	-16	-14	-14	-4	-9	-2	-8
15.0	-21	-18	-15	-14	-2	-8	3	-7
20.0	-20	-19	-15	-16	-6	-11	-3	-10
25.0	-16	-12	-8	-8	6	-1	11	1
30.0	-18	-15	-11	-12	1	-5	4	-4
35.0	-18	-17	-12	-14	-2	-8	1	-7
40.0	-21	-17	-15	-14	-7	-9	-4	-9
45.0	-23	-19	-17	-16	-10	-11	-8	-12
50.0	-18	-18	-10	-14	4	-7	9	-6
60.0	-18	-19	-13	-16	-4	-11	-1	-10
80.0	-23	-17	-15	-13	-8	-9	-5	-9
100.0	-26	-19	-18	-16	-14	-13	-12	-13
120.0	-26	-20	-18	-18	-15	-14	-14	-15
150.0	-26	-18	-18	-17	-17	-14	-16	-15
180.0	-29	-20	-22	-21	-21	-17	-21	-18
200.0	-35	-26	-28	-26	-27	-22	-29	-25
Average	-21	-18	-15	-15	-6	-9	-3	-9
Minimum	-35	-26	-28	-26	-27	-22	-29	-25
Maximum	-16	-12	-8	-8	7	-1	13	1

Overall	90°Lag	30°Lag
Average	-11	-13
Minimum	-35	-26
Maximum	13	1

Calibration Report

RD-33-234 Dytronic Portable Standard

Function.....VA-hour RMS 60 Hz Phase A
Date..... 22-Jun-17 Pulse Output
Serial Number..... 3XXXXX

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 VA-hour calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 3 seconds and the stabilization time in between points is 3 seconds. For lagging power factors the current lags the voltage. All results are listed in $\mu\text{VAh}/\text{VAh}$. The RS-933 has at least a 2 times greater accuracy than the Instrument under test. The results presented on this page are compliant with ANSI/NCSL Z540-1-1994. They are not within Radian 's 17025 Scope of Accreditation.

Voltage & Phase Angle

	120 Unity	120 60°Lag	240 Unity	240 60°Lag	480 Unity	480 60°Lag	600 Unity	600 60°Lag
Amps								
0.2	-2	0	-4	0	-10	-2	-2	8
0.25	-10	-9	-10	-9	-16	-11	-8	-1
0.3	-10	-10	-10	-10	-16	-12	-7	-2
0.5	-11	-9	-13	-8	-18	-10	-10	0
1.0	-11	-9	-12	-8	-18	-10	-10	0
2.0	-9	-8	-10	-7	-16	-9	-8	1
2.5	-10	-8	-11	-8	-17	-11	-8	-1
3.0	-3	0	-4	1	-11	-1	-2	10
4.0	-7	-6	-8	-4	-14	-7	-6	3
5.0	-10	-8	-10	-7	-17	-10	-8	-1
7.0	-23	-20	-23	-18	-29	-20	-21	-9
10.0	-11	-7	-12	-5	-17	-8	-9	1
15.0	-12	-9	-12	-6	-19	-10	-11	0
20.0	-8	-8	-8	-5	-15	-10	-6	0
25.0	1	4	0	7	-6	4	2	14
30.0	-5	-1	-6	2	-13	-2	-6	7
35.0	-2	-4	-3	0	-11	-6	-2	4
40.0	-6	-5	-7	-1	-14	-8	-6	2
45.0	-9	-7	-10	-3	-18	-10	-9	-1
50.0	-5	-8	-5	-2	-14	-7	-6	2
60.0	-8	-8	-8	-5	-15	-10	-6	0
80.0	-6	-8	-6	1	-15	-8	-6	1
100.0	-7	-9	-6	0	-16	-10	-8	-2
120.0	-6	-10	-6	1	-16	-12	-8	-3
150.0	4	-2	5	11	-6	-3	3	4
180.0	3	-3	2	11	-8	-5	0	3
200.0	9	-2	9	15	-1	-1	4	4
Average	-6	-6	-7	-2	-14	-8	-6	2
Minimum	-23	-20	-23	-18	-29	-20	-21	-9
Maximum	9	4	9	15	-1	4	4	14

Overall	Unity	60°Lag
Average	-8	-4
Minimum	-29	-20
Maximum	9	15

Calibration Report

RD-33-234 Dytronic Portable Standard

Function.....VA-hour RMS 60 Hz Phase B
Date..... 22-Jun-17 Pulse Output
Serial Number..... 3XXXXX

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 VA-hour calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 3 seconds and the stabilization time in between points is 3 seconds. For lagging power factors the current lags the voltage. All results are listed in $\mu\text{VAh}/\text{VAh}$. The RS-933 has at least a 2 times greater accuracy than the Instrument under test. The results presented on this page are compliant with ANSI/NC SL Z540-1-1994. They are not within Radian 's 17025 Scope of Accreditation.

Voltage & Phase Angle

Amps	120 Unity	120 60°Lag	240 Unity	240 60°Lag	480 Unity	480 60°Lag	600 Unity	600 60°Lag
0.2	-36	-34	-43	-24	-45	-9	-41	2
0.25	-30	-35	-34	-25	-39	-16	-33	-3
0.3	-33	-35	-39	-28	-42	-17	-35	-8
0.5	-31	-26	-34	-19	-37	-5	-33	6
1.0	-27	-24	-31	-17	-34	-4	-29	8
2.0	-23	-21	-27	-14	-29	-2	-25	10
2.5	-28	-25	-31	-19	-33	-9	-27	0
3.0	-39	-32	-42	-22	-44	-5	-39	9
4.0	-43	-39	-45	-31	-47	-19	-43	-7
5.0	-46	-43	-48	-36	-50	-27	-45	-18
7.0	-26	-21	-28	-11	-30	3	-26	15
10.0	-29	-23	-29	-16	-32	-8	-28	3
15.0	-28	-23	-28	-13	-31	-1	-27	11
20.0	-26	-22	-26	-13	-29	-6	-24	5
25.0	-33	-26	-34	-14	-37	1	-33	14
30.0	-38	-32	-38	-21	-42	-10	-38	1
35.0	-38	-35	-38	-24	-42	-16	-38	-6
40.0	-41	-37	-40	-26	-45	-21	-40	-11
45.0	-43	-40	-42	-28	-47	-25	-43	-16
50.0	-31	-26	-31	-11	-36	0	-32	13
60.0	-25	-22	-25	-13	-28	-6	-24	4
80.0	-31	-28	-30	-13	-36	-11	-32	-2
100.0	-32	-30	-30	-15	-37	-17	-33	-8
120.0	-30	-30	-29	-13	-36	-18	-32	-11
150.0	-26	-26	-24	-8	-32	-18	-29	-12
180.0	-25	-27	-25	-7	-33	-20	-29	-15
200.0	-28	-31	-28	-11	-36	-25	-35	-23
Average	-32	-29	-33	-18	-37	-11	-33	-1
Minimum	-46	-43	-48	-36	-50	-27	-45	-23
Maximum	-23	-21	-24	-7	-28	3	-24	15

Overall	Unity	60°Lag
Average	-34	-15
Minimum	-50	-43
Maximum	-23	15

Calibration Report

RD-33-234 Dytronic Portable Standard

Function.....VA-hour RMS 60 Hz Phase C
Date..... 22-Jun-17 Pulse Output
Serial Number..... 3XXXXX

The following data was collected by a Radian Research RS-933 Automated Calibration System. The RS-933 VA-hour calibration is derived directly from (3) Radian RD-22-RTS Dytronic Transfer Standards, traceable to the SI through the National Institute of Standards and Technology (NIST) and/or other National Metrology Institute (NMI). Test time is 3 seconds and the stabilization time in between points is 3 seconds. For lagging power factors the current lags the voltage. All results are listed in $\mu\text{VAh}/\text{VAh}$. The RS-933 has at least a 2 times greater accuracy than the Instrument under test. The results presented on this page are compliant with ANSI/NC SL Z540-1-1994. They are not within Radian 's 17025 Scope of Accreditation.

Voltage & Phase Angle

Amps	120 Unity	120 60°Lag	240 Unity	240 60°Lag	480 Unity	480 60°Lag	600 Unity	600 60°Lag
0.2	-27	-13	-27	-7	-24	6	-27	8
0.25	-25	-20	-24	-15	-24	-5	-25	-1
0.3	-19	-21	-19	-17	-18	-8	-19	-6
0.5	-21	-18	-21	-13	-20	-2	-22	0
1.0	-21	-18	-22	-14	-20	-3	-22	0
2.0	-20	-19	-20	-14	-19	-3	-21	-1
2.5	-20	-18	-20	-15	-19	-5	-20	-4
3.0	-17	-13	-18	-7	-16	7	-18	11
4.0	-17	-15	-18	-11	-16	0	-18	3
5.0	-20	-19	-20	-14	-19	-6	-20	-4
7.0	-18	-15	-18	-9	-16	3	-18	7
10.0	-19	-17	-19	-13	-17	-4	-19	-2
15.0	-21	-17	-21	-12	-20	-1	-22	2
20.0	-20	-19	-20	-15	-18	-6	-20	-4
25.0	-17	-12	-17	-5	-16	7	-18	11
30.0	-18	-14	-18	-8	-17	1	-19	5
35.0	-17	-17	-17	-11	-16	-3	-17	-1
40.0	-20	-17	-20	-12	-19	-5	-20	-3
45.0	-21	-19	-21	-15	-20	-8	-21	-6
50.0	-19	-18	-19	-11	-18	1	-19	5
60.0	-17	-19	-17	-14	-16	-6	-17	-4
80.0	-20	-17	-20	-12	-18	-5	-20	-3
100.0	-21	-21	-22	-15	-19	-10	-21	-9
120.0	-20	-22	-21	-16	-19	-12	-20	-12
150.0	-16	-22	-19	-18	-16	-15	-17	-15
180.0	-18	-24	-22	-21	-18	-18	-19	-19
200.0	-20	-31	-26	-28	-20	-25	-24	-27
Average	-20	-18	-20	-13	-18	-5	-20	-3
Minimum	-27	-31	-27	-28	-24	-25	-27	-27
Maximum	-16	-12	-17	-5	-16	7	-17	11

<u>Overall</u>	Unity	60°Lag
Average	-20	-10
Minimum	-27	-31
Maximum	-16	11