PSL

Power Standards Lab
980 Atlantic Avenue
Alameda, CA 94501 USA
TEL ++1-510-522-4400
FAX ++1-510-522-4455
www.PowerStandards.com

Calibration Certificate No. P3001143-05072015

PQube 3 S/N P3001143

Calibration date: 07 May 2015
Calibration time: 4:15 PM
Calibration location: PSL – Alameda, CA
Temperature: 24°C
Relative humidity: 47%
Calibration software: 1.3.7
Calibrated by: Chuck Lopez

Reference or Source	Serial Number	NIST (or NIST-equivalent) Trace Path	Due Date	Equip. Used
Leeds & Northrup 4221-B 0.1-Ω Standard Resistor	1709567	NIST 817/271591-05	—	
Fluke 731B DC Reference Standard	4455007	NIST 817/271591-05	—	
HP 3458A Digital Multimeter	2823A14288	Simco Cert. No. 6936554	05/06/16	✓
National Instruments USB-9269 Analog Output Module	1876CF6	N/R	N/A	✓
Trek 2210 High-Voltage Amplifier	241	N/R	N/A	✓
Chroma 61601 Programmable AC Source	616010002046	N/R	N/A	✓
HP 33120A Function Generator	US34000902	N/R	N/A	
Fluke 5220A Transconductance Amplifier	2700009	N/R	N/A	

Parameter	PQube 3 Reading	Reference Reading	Reference Uncertainty X% rdg + X% FS	PQube 3 Error X% rdg + X% FS	Published Specification X% rdg + X% FS	Factory Pass/Fail X% rdg + X% FS	Pass/ Fail	Notes
L1-N	120.06 V_{rms}	120.04 V_{rms}	± 0.009%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 600 V_{rms}
L1-N	230.08 V_{rms}	230.06 V_{rms}	± 0.014%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 600 V_{rms}
L1-N	600.30 V_{rms}	600.13 V_{rms}	± 0.022%	0.01%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 600 V_{rms}
L2-N	120.06 V_{rms}	120.04 V_{rms}	± 0.009%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 600 V_{rms}
L2-N	230.08 V_{rms}	230.06 V_{rms}	± 0.014%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 600 V_{rms}
L2-N	600.27 V_{rms}	600.13 V_{rms}	± 0.022%	0.01%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 600 V_{rms}
L3-N	120.06 V_{rms}	120.04 V_{rms}	± 0.009%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 600 V_{rms}
L3-N	230.08 V_{rms}	230.06 V_{rms}	± 0.014%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 600 V_{rms}
L3-N	600.27 V_{rms}	600.13 V_{rms}	± 0.022%	0.01%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 600 V_{rms}
N-Earth	120.06 V_{rms}	120.06 V_{rms}	± 0.009%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 600 V_{rms}
N-Earth	230.12 V_{rms}	230.11 V_{rms}	± 0.014%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 600 V_{rms}
N-Earth	600.30 V_{rms}	600.25 V_{rms}	± 0.022%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 600 V_{rms}
L1-N	120.03 V_{rms}	120.00 V_{rms}	± 0.009%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 600 V_{rms}
L1-N	230.01 V_{rms}	230.00 V_{rms}	± 0.014%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 600 V_{rms}
L1-N	600.09 V_{rms}	599.96 V_{rms}	± 0.022%	0.01%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 600 V_{rms}
L2-N	120.03 V_{rms}	120.00 V_{rms}	± 0.009%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 600 V_{rms}
L2-N	230.01 V_{rms}	230.00 V_{rms}	± 0.014%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 600 V_{rms}
L2-N	600.09 V_{rms}	599.96 V_{rms}	± 0.022%	0.01%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 600 V_{rms}
L3-N	120.03 V_{rms}	120.00 V_{rms}	± 0.009%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 600 V_{rms}
L3-N	230.01 V_{rms}	230.00 V_{rms}	± 0.014%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 600 V_{rms}
L3-N	600.09 V_{rms}	599.96 V_{rms}	± 0.022%	0.01%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 600 V_{rms}
N-Earth	120.03 V_{rms}	120.03 V_{rms}	± 0.009%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 600 V_{rms}
N-Earth	230.05 V_{rms}	230.06 V_{rms}	± 0.014%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 600 V_{rms}
N-Earth	600.16 V_{rms}	600.12 V_{rms}	± 0.022%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 600 V_{rms}
AN1-Earth High Range	-70.136 V	-70.135 V	± 0.0005%	0.00%	± 0.05%	± 0.025%	Pass	DC, FS = 60 V
AN1-Earth High Range	-10.004 V	-10.005 V	± 0.0002%	0.00%	± 0.05%	± 0.025%	Pass	DC, FS = 60 V
AN1-Earth High Range	10.034 V	10.035 V	± 0.0002%	0.00%	± 0.05%	± 0.025%	Pass	DC, FS = 60 V
AN1-Earth High Range	70.126 V	70.136 V	± 0.0005%	-0.01%	± 0.05%	± 0.025%	Pass	DC, FS = 60 V

(Certificate No. P3001143-05072015 continued on next page)

Parameter	PQube 3 Reading	Reference Reading	Reference Uncertainty X% rdg + X% FS	PQube 3 Error X% rdg + X% FS	Published Specification X% rdg + X% FS	Factory Pass/Fail X% rdg + X% FS	Pass/ Fail	Notes
AN2-Earth High Range	-70.136 V	-70.135 V	± 0.0005%	0.00%	± 0.05%	± 0.025%	Pass	DC, FS = 60 V
AN2-Earth High Range	-10.004 V	-10.005 V	± 0.0002%	0.00%	± 0.05%	± 0.025%	Pass	DC, FS = 60 V
AN2-Earth High Range	10.034 V	10.035 V	± 0.0002%	0.00%	± 0.05%	± 0.025%	Pass	DC, FS = 60 V
AN2-Earth High Range	70.126 V	70.136 V	± 0.0005%	-0.01%	± 0.05%	± 0.025%	Pass	DC, FS = 60 V
AN3-Earth High Range	-70.140 V	-70.135 V	± 0.0005%	0.00%	± 0.05%	± 0.025%	Pass	DC, FS = 60 V
AN3-Earth High Range	-10.004 V	-10.005 V	± 0.0002%	0.00%	± 0.05%	± 0.025%	Pass	DC, FS = 60 V
AN3-Earth High Range	10.034 V	10.035 V	± 0.0002%	0.00%	± 0.05%	± 0.025%	Pass	DC, FS = 60 V
AN3-Earth High Range	70.126 V	70.136 V	± 0.0005%	-0.01%	± 0.05%	± 0.025%	Pass	DC, FS = 60 V
AN4-Earth High Range	-70.136 V	-70.135 V	± 0.0005%	0.00%	± 0.05%	± 0.025%	Pass	DC, FS = 60 V
AN4-Earth High Range	-10.004 V	-10.005 V	± 0.0002%	0.00%	± 0.05%	± 0.025%	Pass	DC, FS = 60 V
AN4-Earth High Range	10.031 V	10.035 V	± 0.0002%	-0.01%	± 0.05%	± 0.025%	Pass	DC, FS = 60 V
AN4-Earth High Range	70.123 V	70.136 V	± 0.0005%	-0.01%	± 0.05%	± 0.025%	Pass	DC, FS = 60 V
AN1-Earth High Range	4.9880 V_{rms}	4.9900 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 42 V_{rms}
AN1-Earth High Range	20.014 V_{rms}	20.013 V_{rms}	± 0.010%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 42 V_{rms}
AN1-Earth High Range	69.932 V_{rms}	69.933 V_{rms}	± 0.014%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 42 V_{rms}
AN2-Earth High Range	4.9880 V_{rms}	4.9900 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 42 V_{rms}
AN2-Earth High Range	20.014 V_{rms}	20.013 V_{rms}	± 0.010%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 42 V_{rms}
AN2-Earth High Range	69.932 V_{rms}	69.933 V_{rms}	± 0.014%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 42 V_{rms}
AN3-Earth High Range	4.9880 V_{rms}	4.9900 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 42 V_{rms}
AN3-Earth High Range	20.014 V_{rms}	20.013 V_{rms}	± 0.010%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 42 V_{rms}
AN3-Earth High Range	69.935 V_{rms}	69.933 V_{rms}	± 0.014%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 42 V_{rms}
AN4-Earth High Range	4.9880 V_{rms}	4.9900 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 42 V_{rms}
AN4-Earth High Range	20.014 V_{rms}	20.013 V_{rms}	± 0.010%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 42 V_{rms}
AN4-Earth High Range	69.935 V_{rms}	69.933 V_{rms}	± 0.014%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 42 V_{rms}
AN1-Earth High Range	4.9850 V_{rms}	4.9860 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 42 V_{rms}
AN1-Earth High Range	19.997 V_{rms}	19.997 V_{rms}	± 0.010%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 42 V_{rms}
AN1-Earth High Range	69.871 V_{rms}	69.876 V_{rms}	± 0.014%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 42 V_{rms}
AN2-Earth High Range	4.9850 V_{rms}	4.9860 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 42 V_{rms}
AN2-Earth High Range	19.997 V_{rms}	19.997 V_{rms}	± 0.010%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 42 V_{rms}
AN2-Earth High Range	69.871 V_{rms}	69.876 V_{rms}	± 0.014%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 42 V_{rms}
AN3-Earth High Range	4.9850 V_{rms}	4.9860 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 42 V_{rms}
AN3-Earth High Range	19.997 V_{rms}	19.997 V_{rms}	± 0.010%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 42 V_{rms}
AN3-Earth High Range	69.871 V_{rms}	69.876 V_{rms}	± 0.014%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 42 V_{rms}
AN4-Earth High Range	4.9850 V_{rms}	4.9860 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 42 V_{rms}
AN4-Earth High Range	19.997 V_{rms}	19.997 V_{rms}	± 0.010%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 42 V_{rms}
AN4-Earth High Range	69.871 V_{rms}	69.876V_{rms}	± 0.014%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 42 V_{rms}
AN1-Earth Low Range	-4.9961 V	-4.9964 V	± 0.0002%	0.00%	± 0.05%	± 0.025%	Pass	DC, FS = 10 V
AN1-Earth Low Range	-0.49817 V	-0.49847 V	± 0.0001%	0.00%	± 0.05%	± 0.025%	Pass	DC, FS = 10 V
AN1-Earth Low Range	0.50085 V	0.50104 V	± 0.0001%	0.00%	± 0.05%	± 0.025%	Pass	DC, FS = 10 V
AN1-Earth Low Range	4.9988 V	4.9994 V	± 0.0002%	0.00%	± 0.05%	± 0.025%	Pass	DC, FS = 10 V
AN2-Earth Low Range	-4.9965 V	-4.9964 V	± 0.0002%	0.00%	± 0.05%	± 0.025%	Pass	DC, FS = 10 V
AN2-Earth Low Range	-0.49817 V	-0.49847 V	± 0.0001%	0.00%	± 0.05%	± 0.025%	Pass	DC, FS = 10 V
AN2-Earth Low Range	0.50085 V	0.50104 V	± 0.0001%	0.00%	± 0.05%	± 0.025%	Pass	DC, FS = 10 V
AN2-Earth Low Range	4.9988 V	4.9994 V	± 0.0002%	0.00%	± 0.05%	± 0.025%	Pass	DC, FS = 10 V
AN3-Earth Low Range	-4.9961 V	-4.9964 V	± 0.0002%	0.00%	± 0.05%	± 0.025%	Pass	DC, FS = 10 V
AN3-Earth Low Range	-0.49817 V	-0.49847 V	± 0.0001%	0.00%	± 0.05%	± 0.025%	Pass	DC, FS = 10 V
AN3-Earth Low Range	0.50085 V	0.50104 V	± 0.0001%	0.00%	± 0.05%	± 0.025%	Pass	DC, FS = 10 V
AN3-Earth Low Range	4.9988 V	4.9994 V	± 0.0002%	0.00%	± 0.05%	± 0.025%	Pass	DC, FS = 10 V
AN4-Earth Low Range	-4.9965 V	-4.9964 V	± 0.0002%	0.00%	± 0.05%	± 0.025%	Pass	DC, FS = 10 V
AN4-Earth Low Range	-0.49817 V	-0.49847 V	± 0.0001%	0.00%	± 0.05%	± 0.025%	Pass	DC, FS = 10 V
AN4-Earth Low Range	0.50085 V	0.50104 V	± 0.0001%	0.00%	± 0.05%	± 0.025%	Pass	DC, FS = 10 V
AN4-Earth Low Range	4.9988 V	4.9994 V	± 0.0002%	0.00%	± 0.05%	± 0.025%	Pass	DC, FS = 10 V
AN1-Earth Low Range	0.24976 V_{rms}	0.25060 V_{rms}	± 0.001%	-0.01%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 7 V_{rms}
AN1-Earth Low Range	2.4979 V_{rms}	2.4976 V_{rms}	± 0.004%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 7 V_{rms}
AN1-Earth Low Range	6.9989 V_{rms}	6.9981 V_{rms}	± 0.005%	0.01%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 7 V_{rms}
AN2-Earth Low Range	0.24976 V_{rms}	0.25060 V_{rms}	± 0.001%	-0.01%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 7 V_{rms}
AN2-Earth Low Range	2.4979 V_{rms}	2.4976 V_{rms}	± 0.004%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 7 V_{rms}
AN2-Earth Low Range	6.9989 V_{rms}	6.9981 V_{rms}	± 0.005%	0.01%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 7 V_{rms}
AN3-Earth Low Range	0.24976 V_{rms}	0.25060 V_{rms}	± 0.001%	-0.01%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 7 V_{rms}
AN3-Earth Low Range	2.4979 V_{rms}	2.4976 V_{rms}	± 0.004%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 7 V_{rms}
AN3-Earth Low Range	6.9985 V_{rms}	6.9981 V_{rms}	± 0.005%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 7 V_{rms}

(Certificate No. P3001143-05072015 continued on next page)

Parameter	PQube 3 Reading	Reference Reading	Reference Uncertainty X% rdg + X% FS	PQube 3 Error X% rdg + X% FS	Published Specification X% rdg + X% FS	Factory Pass/Fail X% rdg + X% FS	Pass/ Fail	Notes
AN4-Earth Low Range	0.24976 V_{rms}	0.25060 V_{rms}	± 0.001%	-0.01%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 7 V_{rms}
AN4-Earth Low Range	2.4979 V_{rms}	2.4976 V_{rms}	± 0.004%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 7 V_{rms}
AN4-Earth Low Range	6.9989 V_{rms}	6.9981 V_{rms}	± 0.005%	0.01%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 7 V_{rms}
AN1-Earth Low Range	0.24976 V_{rms}	0.25047 V_{rms}	± 0.001%	-0.01%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 7 V_{rms}
AN1-Earth Low Range	2.4976 V_{rms}	2.4975 V_{rms}	± 0.004%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 7 V_{rms}
AN1-Earth Low Range	6.9985 V_{rms}	6.9983 V_{rms}	± 0.005%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 7 V_{rms}
AN2-Earth Low Range	0.24976 V_{rms}	0.25047 V_{rms}	± 0.001%	-0.01%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 7 V_{rms}
AN2-Earth Low Range	2.4976 V_{rms}	2.4975 V_{rms}	± 0.004%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 7 V_{rms}
AN2-Earth Low Range	6.9985 V_{rms}	6.9983 V_{rms}	± 0.005%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 7 V_{rms}
AN3-Earth Low Range	0.24976 V_{rms}	0.25047 V_{rms}	± 0.001%	-0.01%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 7 V_{rms}
AN3-Earth Low Range	2.4976 V_{rms}	2.4975 V_{rms}	± 0.004%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 7 V_{rms}
AN3-Earth Low Range	6.9985 V_{rms}	6.9983 V_{rms}	± 0.005%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 7 V_{rms}
AN4-Earth Low Range	0.24976 V_{rms}	0.25047 V_{rms}	± 0.001%	-0.01%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 7 V_{rms}
AN4-Earth Low Range	2.4979 V_{rms}	2.4975 V_{rms}	± 0.004%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 7 V_{rms}
AN4-Earth Low Range	6.9985 V_{rms}	6.9983 V_{rms}	± 0.005%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 7 V_{rms}
L1 Current 3.33V Range	0.16892 V_{rms}	0.16883 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 3.33 V_{rms}
L1 Current 3.33V Range	1.6882 V_{rms}	1.6883 V_{rms}	± 0.006%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 3.33 V_{rms}
L1 Current 3.33V Range	4.0013 V_{rms}	4.0012 V_{rms}	± 0.007%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 3.33 V_{rms}
L2 Current 3.33V Range	0.16892 V_{rms}	0.16883 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 3.33 V_{rms}
L2 Current 3.33V Range	1.6882 V_{rms}	1.6883 V_{rms}	± 0.006%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 3.33 V_{rms}
L2 Current 3.33V Range	4.0013 V_{rms}	4.0012 V_{rms}	± 0.007%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 3.33 V_{rms}
L3 Current 3.33V Range	0.16892 V_{rms}	0.16883 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 3.33 V_{rms}
L3 Current 3.33V Range	1.6882 V_{rms}	1.6883 V_{rms}	± 0.006%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 3.33 V_{rms}
L3 Current 3.33V Range	4.0013 V_{rms}	4.0012 V_{rms}	± 0.007%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 3.33 V_{rms}
L4 Current 3.33V Range	0.16892 V_{rms}	0.16883 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 3.33 V_{rms}
L4 Current 3.33V Range	1.6882 V_{rms}	1.6883 V_{rms}	± 0.006%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 3.33 V_{rms}
L4 Current 3.33V Range	4.0009 V_{rms}	4.0012 V_{rms}	± 0.007%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 3.33 V_{rms}
L5 Current 3.33V Range	0.16892 V_{rms}	0.16883 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 3.33 V_{rms}
L5 Current 3.33V Range	1.6882 V_{rms}	1.6883 V_{rms}	± 0.006%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 3.33 V_{rms}
L5 Current 3.33V Range	4.0013 V_{rms}	4.0012 V_{rms}	± 0.007%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 3.33 V_{rms}
L6 Current 3.33V Range	0.16892 V_{rms}	0.16883 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 3.33 V_{rms}
L6 Current 3.33V Range	1.6882 V_{rms}	1.6883 V_{rms}	± 0.006%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 3.33 V_{rms}
L6 Current 3.33V Range	4.0013 V_{rms}	4.0012 V_{rms}	± 0.007%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 3.33 V_{rms}
L7 Current 3.33V Range	0.16892 V_{rms}	0.16883 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 3.33 V_{rms}
L7 Current 3.33V Range	1.6882 V_{rms}	1.6883 V_{rms}	± 0.006%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 3.33 V_{rms}
L7 Current 3.33V Range	4.0013 V_{rms}	4.0012 V_{rms}	± 0.007%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 3.33 V_{rms}
L8 Current 3.33V Range	0.16892 V_{rms}	0.16883 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 3.33 V_{rms}
L8 Current 3.33V Range	1.6882 V_{rms}	1.6883 V_{rms}	± 0.006%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 3.33 V_{rms}
L8 Current 3.33V Range	4.0013 V_{rms}	4.0012 V_{rms}	± 0.007%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 3.33 V_{rms}
L1 Current 3.33V Range	0.16892 V_{rms}	0.16883 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 3.33 V_{rms}
L1 Current 3.33V Range	1.6882 V_{rms}	1.6883 V_{rms}	± 0.006%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 3.33 V_{rms}
L1 Current 3.33V Range	4.0009 V_{rms}	4.0011 V_{rms}	± 0.007%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 3.33 V_{rms}
L2 Current 3.33V Range	0.16892 V_{rms}	0.16883 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 3.33 V_{rms}
L2 Current 3.33V Range	1.6882 V_{rms}	1.6883 V_{rms}	± 0.006%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 3.33 V_{rms}
L2 Current 3.33V Range	4.0009 V_{rms}	4.0011 V_{rms}	± 0.007%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 3.33 V_{rms}
L3 Current 3.33V Range	0.16892 V_{rms}	0.16883 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 3.33 V_{rms}
L3 Current 3.33V Range	1.6882 V_{rms}	1.6883 V_{rms}	± 0.006%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 3.33 V_{rms}
L3 Current 3.33V Range	4.0009 V_{rms}	4.0011 V_{rms}	± 0.007%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 3.33 V_{rms}
L4 Current 3.33V Range	0.16892 V_{rms}	0.16883 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 3.33 V_{rms}
L4 Current 3.33V Range	1.6882 V_{rms}	1.6883 V_{rms}	± 0.006%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 3.33 V_{rms}
L4 Current 3.33V Range	4.0009 V_{rms}	4.0011 V_{rms}	± 0.007%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 3.33 V_{rms}
L5 Current 3.33V Range	0.16892 V_{rms}	0.16883 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 3.33 V_{rms}
L5 Current 3.33V Range	1.6882 V_{rms}	1.6883 V_{rms}	± 0.006%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 3.33 V_{rms}
L5 Current 3.33V Range	4.0009 V_{rms}	4.0011 V_{rms}	± 0.007%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 3.33 V_{rms}
L6 Current 3.33V Range	0.16892 V_{rms}	0.16883 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 3.33 V_{rms}
L6 Current 3.33V Range	1.6882 V_{rms}	1.6883 V_{rms}	± 0.006%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 3.33 V_{rms}
L6 Current 3.33V Range	4.0009 V_{rms}	4.0011 V_{rms}	± 0.007%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 3.33 V_{rms}
L7 Current 3.33V Range	0.16892 V_{rms}	0.16883 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 3.33 V_{rms}
L7 Current 3.33V Range	1.6882 V_{rms}	1.6883 V_{rms}	± 0.006%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 3.33 V_{rms}
L7 Current 3.33V Range	4.0009 V_{rms}	4.0011 V_{rms}	± 0.007%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 3.33 V_{rms}
L8 Current 3.33V Range	0.16892 V_{rms}	0.16883 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 3.33 V_{rms}

(Certificate No. P3001143-05072015 continued on next page)

Parameter	PQube 3 Reading	Reference Reading	Reference Uncertainty X% rdg + X% FS	PQube 3 Error X% rdg + X% FS	Published Specification X% rdg + X% FS	Factory Pass/Fail X% rdg + X% FS	Pass/ Fail	Notes
L8 Current 3.33V Range	1.6882 V_{rms}	1.6883 V_{rms}	± 0.006%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 3.33 V_{rms}
L8 Current 3.33V Range	4.0009 V_{rms}	4.0011 V_{rms}	± 0.007%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 3.33 V_{rms}
L1 Current 333mV Range	0.01686 V_{rms}	0.01685 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 0.333 V_{rms}
L1 Current 333mV Range	0.16884 V_{rms}	0.16883 V_{rms}	± 0.006%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 0.333 V_{rms}
L1 Current 333mV Range	0.40016 V_{rms}	0.40017 V_{rms}	± 0.007%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 0.333 V_{rms}
L2 Current 333mV Range	0.01686 V_{rms}	0.01685 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 0.333 V_{rms}
L2 Current 333mV Range	0.16884 V_{rms}	0.16883 V_{rms}	± 0.006%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 0.333 V_{rms}
L2 Current 333mV Range	0.40016 V_{rms}	0.40017 V_{rms}	± 0.007%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 0.333 V_{rms}
L3 Current 333mV Range	0.01686 V_{rms}	0.01685 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 0.333 V_{rms}
L3 Current 333mV Range	0.16884 V_{rms}	0.16883 V_{rms}	± 0.006%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 0.333 V_{rms}
L3 Current 333mV Range	0.40016 V_{rms}	0.40017 V_{rms}	± 0.007%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 0.333 V_{rms}
L4 Current 333mV Range	0.01686 V_{rms}	0.01685 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 0.333 V_{rms}
L4 Current 333mV Range	0.16884 V_{rms}	0.16883 V_{rms}	± 0.006%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 0.333 V_{rms}
L4 Current 333mV Range	0.40016 V_{rms}	0.40017 V_{rms}	± 0.007%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 0.333 V_{rms}
L5 Current 333mV Range	0.01686 V_{rms}	0.01685 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 0.333 V_{rms}
L5 Current 333mV Range	0.16884 V_{rms}	0.16883 V_{rms}	± 0.006%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 0.333 V_{rms}
L5 Current 333mV Range	0.40016 V_{rms}	0.40017 V_{rms}	± 0.007%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 0.333 V_{rms}
L6 Current 333mV Range	0.01686 V_{rms}	0.01685 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 0.333 V_{rms}
L6 Current 333mV Range	0.16884 V_{rms}	0.16883 V_{rms}	± 0.006%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 0.333 V_{rms}
L6 Current 333mV Range	0.40020 V_{rms}	0.40017 V_{rms}	± 0.007%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 0.333 V_{rms}
L7 Current 333mV Range	0.01686 V_{rms}	0.01685 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 0.333 V_{rms}
L7 Current 333mV Range	0.16884 V_{rms}	0.16883 V_{rms}	± 0.006%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 0.333 V_{rms}
L7 Current 333mV Range	0.40016 V_{rms}	0.40017 V_{rms}	± 0.007%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 0.333 V_{rms}
L8 Current 333mV Range	0.01686 V_{rms}	0.01685 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 0.333 V_{rms}
L8 Current 333mV Range	0.16884 V_{rms}	0.16883 V_{rms}	± 0.006%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 0.333 V_{rms}
L8 Current 333mV Range	0.40016 V_{rms}	0.40017 V_{rms}	± 0.007%	0.00%	± 0.05%	± 0.025%	Pass	50 Hz, FS = 0.333 V_{rms}
L1 Current 333mV Range	0.01686 V_{rms}	0.01686 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 0.333 V_{rms}
L1 Current 333mV Range	0.16884 V_{rms}	0.16883 V_{rms}	± 0.006%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 0.333 V_{rms}
L1 Current 333mV Range	0.40016 V_{rms}	0.40017 V_{rms}	± 0.007%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 0.333 V_{rms}
L2 Current 333mV Range	0.01686 V_{rms}	0.01686 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 0.333 V_{rms}
L2 Current 333mV Range	0.16880 V_{rms}	0.16883 V_{rms}	± 0.006%	-0.01%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 0.333 V_{rms}
L2 Current 333mV Range	0.40012 V_{rms}	0.40017 V_{rms}	± 0.007%	-0.01%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 0.333 V_{rms}
L3 Current 333mV Range	0.01686 V_{rms}	0.01686 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 0.333 V_{rms}
L3 Current 333mV Range	0.16884 V_{rms}	0.16883 V_{rms}	± 0.006%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 0.333 V_{rms}
L3 Current 333mV Range	0.40016 V_{rms}	0.40017 V_{rms}	± 0.007%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 0.333 V_{rms}
L4 Current 333mV Range	0.01686 V_{rms}	0.01686 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 0.333 V_{rms}
L4 Current 333mV Range	0.16884 V_{rms}	0.16883 V_{rms}	± 0.006%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 0.333 V_{rms}
L4 Current 333mV Range	0.40012 V_{rms}	0.40017 V_{rms}	± 0.007%	-0.01%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 0.333 V_{rms}
L5 Current 333mV Range	0.01686 V_{rms}	0.01686 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 0.333 V_{rms}
L5 Current 333mV Range	0.16884 V_{rms}	0.16883 V_{rms}	± 0.006%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 0.333 V_{rms}
L5 Current 333mV Range	0.40016 V_{rms}	0.40017 V_{rms}	± 0.007%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 0.333 V_{rms}
L6 Current 333mV Range	0.01686 V_{rms}	0.01686 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 0.333 V_{rms}
L6 Current 333mV Range	0.16884 V_{rms}	0.16883 V_{rms}	± 0.006%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 0.333 V_{rms}
L6 Current 333mV Range	0.40016 V_{rms}	0.40017 V_{rms}	± 0.007%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 0.333 V_{rms}
L7 Current 333mV Range	0.01686 V_{rms}	0.01686 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 0.333 V_{rms}
L7 Current 333mV Range	0.16884 V_{rms}	0.16883 V_{rms}	± 0.006%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 0.333 V_{rms}
L7 Current 333mV Range	0.40016 V_{rms}	0.40017 V_{rms}	± 0.007%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 0.333 V_{rms}
L8 Current 333mV Range	0.01686 V_{rms}	0.01686 V_{rms}	± 0.001%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 0.333 V_{rms}
L8 Current 333mV Range	0.16884 V_{rms}	0.16883 V_{rms}	± 0.006%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 0.333 V_{rms}
L8 Current 333mV Range	0.40016 V_{rms}	0.40017 V_{rms}	± 0.007%	0.00%	± 0.05%	± 0.025%	Pass	60 Hz, FS = 0.333 V_{rms}

As of this date, PQube 3 S/N P3001143 meets all factory calibration requirements, and its measurements are traceable through an unbroken chain of certified measurement standards to the United States National Institute of Standards and Technology (NIST) or other National Measurement Institutes (NMIs), or through the use of natural physical constants, intrinsic standards, or ratio calibration techniques.

For Power Standards Lab:

Matthew Muh, Senior Engineer
07 May 2015