



YOKOGAWA

European Standards Laboratory
Yokogawa Europe Solutions B.V.
Amersfoort, The Netherlands



CALIBRATION-CERTIFICATE

Certificate number 57678M10163
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Applicant

Instrument WT3000E Digital Power Analyzer Transformer Version
Manufacturer Yokogawa
Type 7WT3003E-2A0-30A3-F/G6/C7/C5/Z
Serial number 91S903698
Inventory number CCE_1_690
ID numbers used standards CSE845 CSE959 CSE960 CSE956 CSE963 CSE1014
Procedure WT3000T_CAL1 Version: 1 of 11-11-2015

Calibration method The Powermeter was compared to the Yokogawa Primary Power Calibration System via a phantom technique. During the calibration the distortion of the applied voltage and current were below 0.1 %. Before calibration the device was powered on for at least 12 hours.

Environmental conditions Temperature (22.7 ± 1) °C
Relative Humidity (52 ± 4) %rh

Date of Calibration 17 October 2016

Result The results of the calibration are shown on the next pages.

The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k such that the coverage probability corresponds to approximately 95%.
The standard uncertainty of measurement has been determined in accordance with the EA4/02.
The long term stability of the calibrated object is not included in the reported expanded uncertainty measurement.
All reported measurements had a normal distribution.
This certificate of calibration is issued in compliance with ISO/IEC 17025

Traceability The measurements have been executed using standards for which the traceability to (inter)national standards has been demonstrated towards the RvA.

Date 17 October 2016
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The Raad voor Accreditatie is member of the European Co-operation for Accreditation (EA) and is one of the signatories to the ILAC Mutual Recognition Arrangements (MRA) for the mutual recognition of calibration Certificates.

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Element 1

Power Calibration 53 Hz 100 V & 1 A range PF = Inductive

Range	Applied	Measured	±Uncertainty	Unit	Deviation %
100 V 1A PF=1	100.000	100.002	0.004	W	0.002
100V 1A PF=0.5	50.000	50.002	0.004	W	0.004
100 V 1A PF=0.05	5.000	5.002	0.003	W	0.032
100 V 1A PF=0.02	2.000	2.002	0.003	W	0.090
100 V 1A PF=0.01	1.000	1.002	0.003	W	0.170
100 V 1A PF=0.001	0.100	0.102	0.003	W	1.700
80 V 1A PF=1	80.000	80.002	0.004	W	0.003
80V 1A PF=0.5	40.000	40.002	0.003	W	0.006
80 V 1A PF=0.05	4.0000	4.0012	0.0028	W	0.030
80 V 1A PF=0.02	1.6000	1.6012	0.0028	W	0.075
80 V 1A PF=0.01	0.8000	0.8010	0.0028	W	0.125
80 V 1A PF=0.001	0.0800	0.0811	0.0028	W	1.375
60 V 0.8A PF=1	48.000	48.002	0.003	W	0.005
60V 0.8A PF=0.5	24.0000	24.0016	0.0021	W	0.007
60 V 0.8A PF=0.05	2.4000	2.4006	0.0017	W	0.025
60 V 0.8A PF=0.02	0.9600	0.9605	0.0017	W	0.052
60 V 0.8A PF=0.01	0.4800	0.4806	0.0017	W	0.125
60 V 0.8A PF=0.001	0.0480	0.0487	0.0017	W	1.458
40 V 0.5A PF=1	20.0000	20.0003	0.0020	W	0.001
40 V 0.5A PF=0.5	10.0000	10.0000	0.0013	W	0.000
40 V 0.5A PF=0.05	1.0000	1.0001	0.0009	W	0.01
40 V 0.5A PF=0.02	0.4000	0.4000	0.0009	W	0.00
40 V 0.5A PF=0.01	0.2000	0.2001	0.0009	W	0.05
40 V 0.5A PF=0.001	0.0200	0.0201	0.0009	W	0.50

Voltage Calibration 53 Hz 100 Volt Range

Range	Applied	Measured	±Uncertainty	Unit	Deviation %
100 V	100.000	100.000	0.003	V	0.000

Current Calibration 53 Hz 1 A Range

Range	Applied	Measured	±Uncertainty	Unit	Deviation %
1 Amp	1.00000	1.00001	0.00003	A	0.001

Element 2

Power Calibration 53 Hz 100 V & 1 A range PF = Inductive

Range	Applied	Measured	±Uncertainty	Unit	Deviation %
100 V 1A PF=1	100.000	100.001	0.004	W	0.001
100V 1A PF=0.5	50.000	50.002	0.004	W	0.003
100 V 1A PF=0.05	5.000	5.001	0.003	W	0.016
100 V 1A PF=0.02	2.000	2.001	0.003	W	0.050
100 V 1A PF=0.01	1.000	1.001	0.003	W	0.090
100 V 1A PF=0.001	0.100	0.101	0.003	W	0.800
80 V 1A PF=1	80.000	80.002	0.004	W	0.002
80V 1A PF=0.5	40.000	40.002	0.003	W	0.004
80 V 1A PF=0.05	4.0000	4.0004	0.0028	W	0.010
80 V 1A PF=0.02	1.6000	1.6007	0.0028	W	0.044
80 V 1A PF=0.01	0.8000	0.8006	0.0028	W	0.075
80 V 1A PF=0.001	0.0800	0.0805	0.0028	W	0.625
60 V 0.8A PF=1	48.000	48.004	0.003	W	0.009
60V 0.8A PF=0.5	24.0000	24.0023	0.0021	W	0.010
60 V 0.8A PF=0.05	2.4000	2.4004	0.0017	W	0.017
60 V 0.8A PF=0.02	0.9600	0.9604	0.0017	W	0.042
60 V 0.8A PF=0.01	0.4800	0.4804	0.0017	W	0.083
60 V 0.8A PF=0.001	0.0480	0.0485	0.0017	W	1.042
40 V 0.5A PF=1	20.0000	20.0011	0.0020	W	0.006
40 V 0.5A PF=0.5	10.0000	10.0004	0.0013	W	0.004
40 V 0.5A PF=0.05	1.0000	1.0000	0.0009	W	0.00
40 V 0.5A PF=0.02	0.4000	0.3999	0.0009	W	-0.03
40 V 0.5A PF=0.01	0.2000	0.1999	0.0009	W	-0.05
40 V 0.5A PF=0.001	0.0200	0.0200	0.0009	W	0.00

Voltage Calibration 53 Hz 100 Volt Range

Range	Applied	Measured	±Uncertainty	Unit	Deviation %
100 V	100.000	100.000	0.003	V	0.000

Current Calibration 53 Hz 1 A Range

Range	Applied	Measured	±Uncertainty	Unit	Deviation %
1 Amp	1.00000	1.00001	0.00003	A	0.001

Element 3

Power Calibration 53 Hz 100 V & 1 A range PF = Inductive

Range	Applied	Measured	±Uncertainty	Unit	Deviation %
100 V 1A PF=1	100.000	100.001	0.004	W	0.001
100V 1A PF=0.5	50.000	50.001	0.004	W	0.002
100 V 1A PF=0.05	5.000	5.001	0.003	W	0.010
100 V 1A PF=0.02	2.000	2.000	0.003	W	0.015
100 V 1A PF=0.01	1.000	1.001	0.003	W	0.050
100 V 1A PF=0.001	0.100	0.100	0.003	W	0.300
80 V 1A PF=1	80.000	80.001	0.004	W	0.001
80V 1A PF=0.5	40.000	40.001	0.003	W	0.001
80 V 1A PF=0.05	4.0000	3.9999	0.0028	W	-0.003
80 V 1A PF=0.02	1.6000	1.6001	0.0028	W	0.006
80 V 1A PF=0.01	0.8000	0.8002	0.0028	W	0.025
80 V 1A PF=0.001	0.0800	0.0802	0.0028	W	0.250
60 V 0.8A PF=1	48.000	48.001	0.003	W	0.003
60V 0.8A PF=0.5	24.0000	24.0006	0.0021	W	0.002
60 V 0.8A PF=0.05	2.4000	2.4000	0.0017	W	0.000
60 V 0.8A PF=0.02	0.9600	0.9601	0.0017	W	0.010
60 V 0.8A PF=0.01	0.4800	0.4799	0.0017	W	-0.021
60 V 0.8A PF=0.001	0.0480	0.0479	0.0017	W	-0.208
40 V 0.5A PF=1	20.0000	19.9996	0.0020	W	-0.002
40 V 0.5A PF=0.5	10.0000	9.9995	0.0013	W	-0.005
40 V 0.5A PF=0.05	1.0000	0.9996	0.0009	W	-0.04
40 V 0.5A PF=0.02	0.4000	0.3998	0.0009	W	-0.05
40 V 0.5A PF=0.01	0.2000	0.1998	0.0009	W	-0.10
40 V 0.5A PF=0.001	0.0200	0.0199	0.0009	W	-0.50

Voltage Calibration 53 Hz 100 Volt Range

Range	Applied	Measured	±Uncertainty	Unit	Deviation %
100 V	100.000	100.001	0.003	V	0.001

Current Calibration 53 Hz 1 A Range

Range	Applied	Measured	±Uncertainty	Unit	Deviation %
1 Amp	1.00000	1.00001	0.00003	A	0.001

Comments :