



YOKOGAWA

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



CALIBRATION-CERTIFICATE

Certificate number 58518P10126
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Applicant

Example Certificate

Example

Instrument

Precision Power Analyzer
Manufacturer Yokogawa
Type WT5000-HE/M1/MTR1/MTR2
Serial number C2UL23017V
Inventory number DEMO_1_177
ID numbers used standards CSE820 CSE976 CSE981 CSE965 CSE1029
Procedure CALWT5000_Freq_MTR2 Version: 1 of 22-01-2019

Calibration method

The Powermeter was compared to the Yokogawa 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 (42 ± 4) %rh

Date of Calibration

04 February 2019

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 2 such that the coverage probability corresponds to approximately 95 %.
The standard uncertainty of measurement has been determined in accordance with the EA-4/02 M:2013.
The long term stability of the calibrated object is not included in the reported expanded uncertainty measurement.
This certificate of calibration is issued in compliance with ISO/IEC 17025:2005

Traceability

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

Date

04 February 2019

Name

E.J. Kroon

Function

Manager European Standards Laboratory

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Example

Motor 1

Analog Torque Calibration (1V = 1 Nm) set in the instrument.

Range	Applied	Measured	±Uncertainty	Unit	Deviation %
torqueanalog20V	20.000000	19.999800	0.000002	Nm	-0.001
torqueanalog20V	-20.000000	-20.000000	0.000002	Nm	0.000
torqueanalog10V	10.0000	9.9999	0.0005	Nm	-0.001
torqueanalog10V	2.00000	1.99990	0.00008	Nm	-0.005
torqueanalog10V	-2.00000	-2.00010	0.00029	Nm	0.005
torqueanalog10V	-10.0000	-10.0001	0.0006	Nm	0.001
torqueanalog5V	5.0000	4.9996	0.0006	Nm	-0.007
torqueanalog5V	-5.0000	-4.9999	0.0006	Nm	-0.002
torqueanalog2V	2.00000	1.99991	0.00008	Nm	-0.004
torqueanalog2V	-2.00000	-2.00015	0.00029	Nm	0.008
torqueanalog1V	1.00000	0.99989	0.00021	Nm	-0.011
torqueanalog1V	-1.00000	-1.00013	0.00014	Nm	0.013

Pulse Torque Calibration 1 KHz (1000 Hz = 1000 nm) set in the instrument.

Range	Applied	Measured	±Uncertainty	Unit	Deviation %
torquepulse	1000.00000	999.99800	0.00014	Nm	0.000

Pulse Speed Calibration 1 kHz (1000 Hz = 1000 rpm) set in the instrument.

Range	Applied	Measured	±Uncertainty	Unit	Deviation %
speedpulse	1000.00000	999.99800	0.00014	rpm	0.000

Motor 2

Analog Torque Calibration (1V = 1 Nm) set in the instrument.

Range	Applied	Measured	±Uncertainty	Unit	Deviation %
torqueanalog20V	20.000000	20.000267	0.000002	Nm	0.001
torqueanalog20V	-20.000000	-20.000300	0.000002	Nm	0.001
torqueanalog10V	10.0000	10.0002	0.0005	Nm	0.002
torqueanalog10V	2.00000	2.00013	0.00010	Nm	0.007
torqueanalog10V	-2.00000	-2.00003	0.00029	Nm	0.002
torqueanalog10V	-10.0000	-10.0002	0.0006	Nm	0.002
torqueanalog5V	5.0000	4.9998	0.0006	Nm	-0.004
torqueanalog5V	-5.0000	-4.9999	0.0006	Nm	-0.001
torqueanalog2V	2.00000	1.99998	0.00008	Nm	-0.001
torqueanalog2V	-2.00000	-2.00015	0.00029	Nm	0.008
torqueanalog1V	1.00000	0.99994	0.00021	Nm	-0.006
torqueanalog1V	-1.00000	-1.00011	0.00014	Nm	0.011

Pulse Torque Calibration 1 KHz (1000 Hz = 1000 nm) set in the instrument.

Range	Applied	Measured	±Uncertainty	Unit	Deviation %
torquepulse	1000.00000	999.99800	0.00014	Nm	0.000

Pulse Speed Calibration 1 kHz (1000 Hz = 1000 rpm) set in the instrument.

Range	Applied	Measured	±Uncertainty	Unit	Deviation %
speedpulse	1000.00000	999.99800	0.00014	rpm	0.000



Motor 3

Analog Torque Calibration (1V = 1 Nm) set in the instrument.

Range	Applied	Measured	±Uncertainty	Unit	Deviation %
torqueanalog20V	20.000000	19.999700	0.000002	Nm	-0.001
torqueanalog20V	-20.000000	-20.000300	0.000002	Nm	0.001
torqueanalog10V	10.0000	10.0000	0.0005	Nm	0.000
torqueanalog10V	2.00000	2.00000	0.00008	Nm	0.000
torqueanalog10V	-2.00000	-2.00010	0.00029	Nm	0.005
torqueanalog10V	-10.0000	-10.0001	0.0006	Nm	0.001
torqueanalog5V	5.0000	4.9997	0.0006	Nm	-0.005
torqueanalog5V	-5.0000	-4.9998	0.0006	Nm	-0.003
torqueanalog2V	2.00000	1.99994	0.00008	Nm	-0.003
torqueanalog2V	-2.00000	-2.00012	0.00029	Nm	0.006
torqueanalog1V	1.00000	0.99990	0.00021	Nm	-0.010
torqueanalog1V	-1.00000	-1.00011	0.00014	Nm	0.011

Pulse Torque Calibration 1 KHz (1000 Hz = 1000 nm) set in the instrument.

Range	Applied	Measured	±Uncertainty	Unit	Deviation %
torquepulse	1000.00000	999.99800	0.00014	Nm	0.000

Pulse Speed Calibration 1 kHz (1000 Hz = 1000 rpm) set in the instrument.

Range	Applied	Measured	±Uncertainty	Unit	Deviation %
speedpulse	1000.00000	999.99800	0.00014	rpm	0.000

Motor 4

Analog Torque Calibration (1V = 1 Nm) set in the instrument.

Range	Applied	Measured	±Uncertainty	Unit	Deviation %
torqueanalog20V	20.000000	19.999733	0.000002	Nm	-0.001
torqueanalog20V	-20.000000	-19.999433	0.000002	Nm	-0.003
torqueanalog10V	10.0000	9.9999	0.0005	Nm	-0.001
torqueanalog10V	2.00000	2.00010	0.00008	Nm	0.005
torqueanalog10V	-2.00000	-1.99990	0.00029	Nm	-0.005
torqueanalog10V	-10.0000	-9.9998	0.0006	Nm	-0.002
torqueanalog5V	5.0000	4.9997	0.0006	Nm	-0.006
torqueanalog5V	-5.0000	-4.9997	0.0006	Nm	-0.007
torqueanalog2V	2.00000	1.99987	0.00008	Nm	-0.006
torqueanalog2V	-2.00000	-2.00010	0.00029	Nm	0.005
torqueanalog1V	1.00000	0.99989	0.00021	Nm	-0.011
torqueanalog1V	-1.00000	-1.00009	0.00014	Nm	0.009

Pulse Torque Calibration 1 KHz (1000 Hz = 1000 nm) set in the instrument.

Range	Applied	Measured	±Uncertainty	Unit	Deviation %
torquepulse	1000.00000	999.99800	0.00014	Nm	0.000

Pulse Speed Calibration 1 kHz (1000 Hz = 1000 rpm) set in the instrument.

Range	Applied	Measured	±Uncertainty	Unit	Deviation %
speedpulse	1000.00000	999.99800	0.00014	rpm	0.000

Comments :