TECHNOLOGY PROMOTION ASSOCIATION (THAILAND-JAPAN)
CORPORATE SERVICES 3 : EQUIPMENT CALIBRATION AND TESTING SERVICES
534/4 PATTANAKARN ROAD SOI 18, SUANLUANG, SUANLUANG BANGKOK 10250
TEL. 0-2717-3000-29 FAX. 0-2719-9484

Certificate of Calibration

Equipment :	Electrosurgery Analyzer
Model :	QA-ES III
Serial No. :	5728726
ID No. :	-
Manufacturer :	Fluke Biomedical
Submitted by :	National Healthcare Systems Co., Ltd. 2301/2 New Petchburi Soi 47 (Soonvijai), Bangkapi, Huaykwang, Bangkok 10310
Place of calibration :	TPA Medical Equipment Calibration Lab.
Ambient temperature :	(23 ± 2) °C
Relative humidity :	(50 ± 15) %
Calibrated by :	Natjika Kaewmadeengam

Approved by : Malee.

Approved signatory

(✓) Malee Butkruea
( ) Surin Yenprasert
( ) Nattachai Sawangkunnopchai

Issue date : 26 June 2023

The Uncertainties are for a confidence probability of approximately 95%.

Received order : 20 June 2023
Condition as received : Used item
Calibration date : 21 June 2023
Reference : 2306-0654DSC-1

Procedure used :-

Calibration was conducted using in-house calibration procedure : CP-MD10, according to direct measurement method for load resistors and indirect measurement method for electrical power.

Conditions of this result of calibration

1. Reference standard instrument :-

Instrument	Model	Serial No.	Cert. No.	Due date
1) Digital Multimeter	34410A	MY53002082	22E2922	1 Sep 2023
2) RMS/Peak Voltmeter	URE3	101202	23E1379	25 Apr 2024

2. The certificate is valid only to the item calibrated on date and place of calibration.
3. This result of calibration was made on requested at the point specified by customer.
4. This certification is traceable to the International System of Units, through :-

- National Institute of Metrology (Thailand), through Technology Promotion Association (Thailand-Japan)

Result of checking : Without adjustment
Check step : Foot switch output

Port of UUC*	Measure Value (Ω)	Criteria Acceptance (Ω)	Result
Foot switch	0.0364	< 0.5	Pass

Result of calibration : Without adjustment
Calibration step : Measure the Fixed Load
Port of UUC* : Fixed Load

UUC* Nominal value (Ω)	Standard Reading (Ω)	UUC* Error (Ω)	Uncertainty (± Ω)
200	200.101	-0.101	0.035

UUC* : Unit Under Calibration

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Result of calibration : Without adjustment
Calibration step : Measure the Load resistors
Mode : Generator output
Port of UUC* : Load / Variable (HI & LO)

UUC* Setting (Ω)	Standard Reading (Ω)	UUC* Error (Ω)	Uncertainty (± Ω)
10	10.0816	-0.0816	0.00079
50	50.0627	-0.0627	0.011
100	100.180	-0.180	0.017
200	200.128	-0.128	0.035
300	300.135	-0.135	0.047
400	400.338	-0.338	0.058
500	500.347	-0.347	0.070
800	799.478	0.522	0.11
1600	1595.00	5.00	0.31

Result of calibration : Without adjustment
Function : RF Leakage current
Port of UUC* : Load / Variable (HI & LO)

Applied Current (mA)	UUC* Reading (mA)	UUC* Error (mA)	Uncertainty (± mA)
75.5226	75	-0.5226	0.051
150.606	149	-1.606	0.10

UUC* : Unit Under Calibration

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Result of calibration : Without adjustment

Function : Power measurement

Mode : Generator output

Port of UUC* : Load / Variable (HI & LO)

UUC* Load setting (Ω)	Applied Power (Watt)	UUC* Reading (Watt)	UUC* Error (Watt)	Uncertainty (± Watt)
300	52.89	51.9	-0.99	0.060
300	105.7	106	0.3	0.58
300	161.7	161	-0.7	0.58
300	215.8	216	0.2	0.58
300	266.9	262	-4.9	0.58
300	321.2	315	-6.2	0.58

UUC* : Unit Under Calibration

The reported uncertainty of measurement was based on a standard uncertainty multiplied by a coverage factor (k = 2), providing a level of confidence of approximately 95 %.

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