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Biomedical

Manual Supplement Rev. 4 for QA-ES III Electrosurgical Analyzer Users Manual (Rev. 1)

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This supplement contains information necessary to ensure the accuracy of the above manual.

About This Manual Supplement

This document is a manual supplement against the QA-ES III Electrosurgical Analyzer User Manual (Rev. 1 12/15). This document acts as an erratum to the original manual. Any changes detailed in this document reflect the most up-to-date information about the product.

Change #1, 623, 229, 252

Starting on page 51, replace the **Technical Specification** section through the **HF Leakage Current** sub-section with:

Technical Specifications

Specifications apply for a period of one year from date of the most recent calibration.

Measures Cut and coag waveforms

Monopolar and bipolar outputs

Power and current

measurements true RMS

Bandwidth 30 Hz to 5 MHz at -3 dB including loads

Delay Time for single

measurements 0.2 seconds to 4.0 seconds from Foot Switch activation to start of measurement

Duty Cycle

Variable Load 10 seconds on, 30 seconds off, at 100 W, all loads

Fixed 200 Ω Load 10 seconds on, 30 seconds off, at 400 W

Load Bank

Load Resistance

Variable 0 Ω , 10 Ω , 20 Ω , 25 Ω to 2500 Ω (by 25 Ω), 2500 Ω to 5200 Ω (by 100 Ω)

DC Accuracy $\pm 2.5\%$

Power Handling (for inputs <5Mhz)

At 25% duty cycle (10 seconds on,

30 seconds off)..... 10 Ω : 300 W, 20 Ω to 2900 Ω : 400 W, 3000 Ω to 5200 Ω : 200 W

At 10% duty cycle (5 seconds on,
 45 seconds off)10 Ω : 300 W,
 20 Ω to 2400 Ω : 500 W,
 2425 Ω to 2900 Ω : 400 W,
 3000 Ω to 5200 Ω : 200 W

Power Handling (for inputs >5MHz):

150W maximum for all duty cycles/loads listed above.

Table 1. System Bandwidth including Load Bank

Load Resistance Setting	Bandwidth (kHz) 5% Accuracy
10 – 25 Ω	1kHz – 400 kHz
50 – 125 Ω	1kHz – 3000 kHz
200 – 275 Ω	1kHz – 1800 kHz
400 – 500 Ω	1kHz – 1800 kHz
800 – 1400 Ω	1kHz – 1800 kHz
1650 – 2300 Ω	1kHz – 3000 kHz
2500 – 2900 Ω	1kHz – 3000 kHz
4200 – 4300 Ω	1kHz – 1800 kHz
4600 – 5100 Ω	1kHz – 1800 kHz
All other settings	1kHz – 1000 kHz

System Bandwidth..... 3 MHz at -3 dB including loads (2 MHz for 10 Ω setting)

Power

Ranges 0.0 W to 99.9 W
 100 W to 500 W
 Accuracy..... < 10 W: ±5 % + 1 W
 10 W: ±5 %

Current

RMS 0 mA to 5,500 mA
 Accuracy..... ±(2.5 % of reading + 1 mA)

Voltage

Peak 10 kV Peak to Peak
 Accuracy..... ±(10 % of reading + 50 V)

Crest Factor 1.4 to 16.0

Defined as the ratio of Peak voltage to RMS voltage (Vpk / Vrms), using the larger of the 2 peaks (positive or negative)

Vessel Sealing Measurement

Loop Current, RMS..... 0 mA to 5500 mA
 Accuracy ±(2.5 % of reading + 1 mA)

HF Leakage Current

Fixed Load 200 Ω
 Load Accuracy ±2.5 %
 Power rating 400 W
 Additional Fixed Load..... 200 Ω
 Current, RMS 0 mA to 5500 mA

Accuracy.....±(2.5 % of reading + 1 mA)
 Bandwidth.....1 kHz – 6.5 MHz, ± 5%
 1 kHz – 10 MHz, -3 dB

Change #2, 781, 248

On page 2, add the following to the **Symbols** table:

	Conforms to relevant South Korean EMC Standards.
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On page 51, under **Electromagnetic Compatibility (EMC)**, add:

Korea (KCC).....Class A Equipment (Industrial Broadcasting & Communication Equipment)

Class A: Equipment meets requirements for industrial electromagnetic wave equipment and the seller or user should take notice of it. This equipment is intended for use in business environments and not to be used in homes.

Change #3, 18

On page 4, under **Safety Information**, add these warnings:

- The chassis ground of the ESU must be tied to the Ground Lug (Item 12 on Figure 1) of the QA-ES III using one of the safety leads, provided as a standard accessory, during all testing for ESUs with operating frequencies >1 MHz.
- The ESU and QA-ES III must be plugged in to the same power receptacle.
- Do not exceed 2-meter power leads for both the ESU and the QA-ES III.

- Avoid connecting the ESU and/or QA-ES III to power strips with long power leads or into tables fitted with outlets (that also have long power leads).
- Stay clear of the ESU, its leads, and the QA-ES III during powered operation and testing

Change #4, CK 5/7/21

Under **Technical Specifications**, which starts on page 51, change the following bandwidth spec:

From:

Bandwidth30 Hz to 5 MHz at -3 dB including loads

To:

Bandwidth.....3 MHz at -3 dB including loads (2 MHz for 10 Ω setting)