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

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. 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 ................................................... ±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**

<table>
<thead>
<tr>
<th>Load Resistance Setting</th>
<th>Bandwidth (kHz) 5% Accuracy</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 – 25 Ω</td>
<td>1kHz – 400 kHz</td>
</tr>
<tr>
<td>50 – 125 Ω</td>
<td>1kHz – 3000 kHz</td>
</tr>
<tr>
<td>200 – 275 Ω</td>
<td>1kHz – 1800 kHz</td>
</tr>
<tr>
<td>400 – 500 Ω</td>
<td>1kHz – 1800 kHz</td>
</tr>
<tr>
<td>800 – 1400 Ω</td>
<td>1kHz – 1800 kHz</td>
</tr>
<tr>
<td>1650 – 2300 Ω</td>
<td>1kHz – 3000 kHz</td>
</tr>
<tr>
<td>2500 – 2900 Ω</td>
<td>1kHz – 3000 kHz</td>
</tr>
<tr>
<td>4200 – 4300 Ω</td>
<td>1kHz – 1800 kHz</td>
</tr>
<tr>
<td>4600 – 5100 Ω</td>
<td>1kHz – 1800 kHz</td>
</tr>
<tr>
<td>All other settings</td>
<td>1kHz – 1000 kHz</td>
</tr>
</tbody>
</table>
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:

| K  | Conforms to relevant South Korean EMC Standards. |

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

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