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RF-EXPOSURE ASSESSMENT REPORT

FCC 47 CFR Part 2.1091
Industry Canada RSS-102

RF-Exposure evaluation of mobile equipment

Report Reference No.....:	G0M-1501-4486-TFC091MEM-V01
Testing Laboratory.....:	Eurofins Product Service GmbH
Address.....:	Storkower Str. 38c 15526 Reichenwalde Germany
Accreditation.....:	A2LA Accredited Testing Laboratory, Certificate No.: 1983.01 FCC Filed Test Laboratory, Reg.-No.: 96970 IC OATS Filing assigned code: 3470A
Applicant's name.....:	Olympus Winter & Ibe GmbH
Address.....:	Kuehnstr. 61 22045 Hamburg Germany
Test specification:	
Standard.....:	47 CFR 1.1310 / 47 CFR 2.1091 / 47 CFR 2.1093 OET Bulletin 65:1997 RSS-102, Issue 5:2015 Safety Code 6:2015
Equipment under test (EUT):	
Product description	Electrosurgical Generator
Model No.	CELON ELITE ESG-200 (WA90001A, WA90002A)
Additional Model(s)	CELON Precision (WA90008A, WA90009A)
Brand Name(s)	OLYMPUS
Hardware version	W7106586-02 - Zero Series / (incl. Rework to W7112354-03)
Firmware / Software version	CELON ELITE (EMC Test) Software Version 3.06-X
	FCC-ID: 2AERUESG200 IC: 20280-ESG200
Test result	**Passed**

Possible test case verdicts:	
- neither assessed nor tested ..... :	N/N
- required by standard but not appl. to test object..... :	N/A
- required by standard but not tested..... :	N/T
- not required by standard for the test object ..... :	N/R
- test object does meet the requirement..... :	P (Pass)
- test object does not meet the requirement..... :	F (Fail)

Testing:

Test Lab Temperature ..... :	20 – 23 °C	
Test Lab Humidity ..... :	32 – 38 %	
Date of receipt of test item ..... :	2015-02-23	
Date (s) of assessment ..... :	2015-05-08	
Compiled by ..... :	Christian Weber	
Assessed by (+ signature) ..... : (Responsible for Assessment)	Christian Weber	C. Locka .....
Approved by (+ signature) ..... :	Toralf Jahn	T. J .....
Date of issue ..... :	2016-01-27	
Total number of pages ..... :	13	

General remarks:

The test results presented in this report relate only to the object tested.

The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report.

Additional comments:

OLYMPUS

Your Vision, Our Future

OLYMPUS SURGICAL TECHNOLOGIES EUROPE, Rheinstraße 8, 14513 Teltow

To whom it may concern

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Ihre Nachricht vom:
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Datum: 2015-09-09

Differences between CELON Elite ESG-200 and CELON Precision

The ESG-200 exists in four variants. There are two different types of CELON Elite ESG-200 (WA90001A, WA90002A) and two different types of CELON Precision (WA90008A, WA90009A).

The hardware is identical except for the following differences:
E-type (WA90001A; WA90008A) and B-type (WA90002A; WA90009A) feature different monopolar front sockets (E = "Erbe" socket; B = "Bovie" socket). Each of the four variants has its proper type plate, front panel and labelling.

The software is 100% identical. During final assembly the software is programmed and a software flag is set in order to define the product type – CELON Elite ESG-200 or CELON Precision. This flag enables and disables certain output modes. Only for CELON Elite ESG-200 the monopolar cut mode PulseCut is available. In addition the dedicated RFITT modes are only available with certain RFITT probes and enabled via instrument recognition. For CELON Elite ESG-200 these are Fine RFITT, Pure RFITT, Strong RFITT, and Strong RFITT + RCAP. For CELON Precision these are Pulse RFITT, RFITT, and Strong RFITT.

Best regards,

Erik Paul
Manager Regulatory Affairs
Regulatory Affairs

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Geschäftsführer: Dr. André Roggan (Vorsitzender), Stefan Kaufmann, Tetsuaki Mori, Akihiro Taguchi, Ken Yoshimasu, Reinhard Zentner
Sitz der Gesellschaft: Hamburg, Handelsregister: Amtsgericht Hamburg HRB 16 328

Version History

Version	Issue Date	Remarks	Revised by
01	2016-01-27	Initial Release	

Eurofins Product Service GmbH
Storkower Str. 38c, D-15526 Reichenwalde, Germany

REPORT INDEX

1 Equipment (Test item) Description

Description	Electrosurgical Generator
Model	CELON ELITE ESG-200 (WA90001A, WA90002A)
Additional Model(s)	CELON Precision (WA90008A, WA90009A)
Brand Name(s)	OLYMPUS
Serial number	W000004
Hardware version	W7106586-02 - Zero Series / (incl. Rework to W7112354-03)
Software / Firmware version	CELON ELITE (EMC Test) Software Version 3.06-X
FCC-ID	2AERUESG200
IC	20280-ESG200
Equipment type	End product

1.1 Reference Documents

Document type	Document No.	Issued by	Date
FCC 15.225 Test Report	G0M-1501-4486-TFC225RIM-V01	Eurofins Product Service GmbH	2016-01-26

1.2 Radiation Sources

Mode #	Description	
13.56MHz	Frequency range [MHz]	13.56
	Channels	1
	Modulations	OOK
	Maximum transmission duty cycle [%]	100

2 Result Summary

FCC 47 CFR Part 2.1091, IC RSS-102			
Product Specific Standard Section	**Requirement**	**Result**	**Remarks**
47 CFR 2.1091	Maximum permissible exposure @ 20cm below limit	PASS	
RSS-102 2.5.2	Maximum permissible exposure @ 20cm below limit	PASS	
Remarks:			

3 RF-Exposure Classifications

Device Types	
Fixed	A fixed device is defined as a device physically secured at one fixed location and cannot be easily re-located.
Mobile	A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. (47 CFR 2.1091)
Portable	A portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user. (47 CFR 2.1093)

Exposure Categories	
Occupational / Controlled	Limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.
General population / uncontrolled	Exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

4 Assessment

4.1 MPE Assessment – 47 CFR 2.1091 / RSS-102

MPE Assessment acc. to 47 CFR 2.1091 / IC RSS-102				**Verdict: PASS**
Assessment according to reference	Reference Method			
	FCC OET Bulletin 65 / RSS-102 & Safety Code 6			
Device type	mobile			
Exposure category	General public			
IC Limits – Occupational / Controlled Exposure				
Frequency range [MHz]	Electric field strength [V/M]	Magnetic field strength [A/M]	Power density [W/m^2]	Averaging time [min]
0.003-10	83	90	-	Instantaneous*
0.1-10	-	0.73/ f	-	6**
1.1-10	87/ $f^{0.5}$	-	-	6**
10-20	27.46	0.0728	-2	6
20-48	58.07/ $f^{0.25}$	0.1540/ $f^{0.25}$	8.944/ $f^{0.5}$	6
48-300	22.06	0.05852	1.291	6
300-6000	3.142 $f^{0.3417}$	0.008335 $f^{0.3417}$	0.02619 $f^{0.6834}$	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	616000/ $f^{1.2}$
150000-300000	0.158 $f^{0.5}$	4.21 x 10^{-4} $f^{0.5}$	6.67 x 10^{-5} f	616000/$f^{1.2}$
IC Limits – General Population / Uncontrolled Exposure				
Frequency range [MHz]	Electric field strength [V/M]	Magnetic field strength [A/M]	Power density [W/m^2]	Averaging time [min]
0.003-10	170	180	-	Instantaneous*
0.1-10	-	1.6/ f	-	6**
1.29-10	193/ $f^{0.5}$	-	-	6**
10-20	61.4	0.163	-10	6
20-48	129.8/ $f^{0.25}$	0.3444/ $f^{0.25}$	44.72/ $f^{0.5}$	6
48-100	49.33	0.1309	6.455	6
100-6000	15.60 $f^{0.25}$	0.04138 $f^{0.25}$	0.6455$f^{0.5}$	6
6000-15000	137	0.364	50	6
15000-150000	137	0.364	50	616000/$f^{1.2}$
150000-300000	0.354 $f^{0.5}$	9.40 x 10^{-4} $f^{0.5}$	3.33 x 10^{-4} f	616000/$f^{1.2}$
* Based on nerve stimulation (NS). ** Based on specific absorption rate (SAR). f in MHz				

FCC Limits – Occupational / Controlled Exposure				
Frequency range [MHz]	Electric field strength [V/M]	Magnetic field strength [A/M]	Power density [mW/cm^2]	Averaging time [min]
0.3 – 3.0	614	1.63	(100)*	6
3.0 - 30	1842/f	4.89/f	(900/f^2)*	6
30 - 300	61.4	0.163	1.0	6
300 - 1500	N/A	N/A	f/300	6
1500 - 100000	N/A	N/A	5.0	6
FCC Limits – General Population / Uncontrolled Exposure				
Frequency range [MHz]	Electric field strength [V/M]	Magnetic field strength [A/M]	Power density [mW/cm^2]	Averaging time [min]
0.3 – 1.34	614	1.63	(100)*	30
1.34 - 30	842/f	2.19/f	(180/f^2)*	30
30 - 300	27.5	0.073	0.2	30
300 - 1500	N/A	N/A	f/1500	30
1500 - 100000	N/A	N/A	1.0	30
* = Plane wave equivalent power density; f in MHz				

Assessment procedure
For each radio and frequency band the worst case transmission mode with the highest Electric Field and Magnetic Field is evaluated at the frequency that results in the most restrictive rf-exposure limit.

Assessment results	
Transmission mode	
Operating mode frequency range [MHz]	13.56
Assessment frequency [MHz]	13.56
RF Field Strength Limit	
Electric Field (V/m)	27.46
Magnetic Field Strength (A/m, RMS)	0.0728
Measured RF Field Strength @ 0cm to EUT	
Electric Field (V/m)	13.91
Magnetic Field Strength (A/m, RMS)	0.051
Verdict	
PASS	
Comments:	

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