

OPERATOR'S MANUAL

MetaSTAR™ RF Generator

Catalog No. 3195



Manufactured By:

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Patents pending

CAUTION: Federal law (USA) restricts this device to sale by or on the order of a physician.

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Although this guide has been prepared with every regard to insure the accuracy of its contents, Merit Medical Systems, Inc. assumes no liability for any damages incurred from the application of this information. The recommendations are designed to serve as a general guideline. They are not intended to supersede institutional protocols or professional clinical judgment concerning patient care.

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MetaSTAR RF Generator User Manual

Catalog No. 3195 (English) (EN)

CAUTION: Federal law (US) restricts this device to sale by or on the order of a physician.

1. BRIEF DEVICE DESCRIPTION:

The MetaSTAR RF Generator is a microprocessor controlled low power radiofrequency (RF) generator used for percutaneous delivery of bi-polar radiofrequency energy intended to heat the target tissue of the SpineSTAR™ Ablation Instrument.

2. INDICATIONS FOR USE:

The MetaSTAR RF Generator is indicated for palliative treatment in spinal procedures by ablation of metastatic malignant lesions in a vertebral body.

3. CONTRAINDICATIONS:

In some cases the system may interfere with normal functions of some types of implanted pacemakers. The MetaSTAR RF Generator is contraindicated for patients who have pacemakers or other electrical implants. Please refer to the SpineSTAR Ablation Instrument instructions for use for a more comprehensive list of contraindications regarding specific procedures.

4. WARNINGS:

- Warning:** Do not ablate in painful osteoporotic vertebra without tumor.
- Warning:** Do not use this device in patients without metastatic malignant lesions in a vertebral body.
- Warning:** Do not use this device in patients with multiple myeloma, solitary plasma cytoma, or primary malignant lesions in the index vertebra.
- Warning:** The device is designed for tumor ablation; follow the IFU for the applicable device(s) used during the procedure.
- Warning:** Hazardous electrical output. This equipment is for use only by qualified medical personnel trained in the use of the MetaSTAR RF Generator.
- Warning:** Do not operate the unit in close proximity to volatile solvents such as methanol or alcohol, or in the presence of flammable anesthetics, as explosion may occur.
- Warning:** Do not operate unit in moist environment, as a shock hazard may exist. If liquids have entered the unit, the MetaSTAR RF Generator must be returned to the manufacturer for testing prior to use.
- Warning:** Interference produced by the operation of high-frequency equipment may adversely affect the operation of other electronic medical equipment such as monitors, imaging systems.
- Warning:** Failure of the equipment could result in an unintended increase of output power.
- Warning:** Use of accessories and cables, other than those specified may affect system performance, resulting in increased emissions or decreased immunity of the system.
- Warning:** Servicing other than replacing the fuse should be performed by the manufacturer.
- Warning:** Use only hospital grade power cord.
- Warning:** In case of Generator failure switch off/unplug the power cord.
- Warning:** Ablation procedures must be performed under fluoroscopic image guidance. Do not perform ablation without imaging as it may result in severe injury to patient.
- Warning:** Do not remove data port cover or connect any equipment to the data port.
- Warning:** To avoid risk of electric shock, this equipment must only be connected to a supply mains with protective earth.

5. PRECAUTIONS:

Caution: Removing screws and opening of this device may invalidate the warranty.

Caution: 

Caution: It is important to read these instructions for use and these precautions prior to device operation.

Caution: Replace fuses only with the same type and rating: 5 x 20 mm 3.15A/250V(2 each).

Caution: Do not sterilize the MetaSTAR RF Generator. Sterilization may damage the unit.

Caution: Reconditioning, refurbishing, repair, modification, of the device to enable further use is expressly prohibited as it may result in loss of function and/or patient injury.

Caution: Do not block or restrict the openings on the bottom and back of the MetaSTAR RF Generator, as they provide the required airflow for cooling.

Caution: If electromagnetic interference with other equipment is suspected, reorient the device or remove possible sources of interference (e.g., cellular phones, radios, etc.) from the room.

Caution: Any monitoring electrodes recommended to be placed as far as possible from the SpineSTAR Ablation Instrument when high frequency surgical equipment and physiological monitoring equipment are used simultaneously on the same patient. Monitoring systems incorporating high frequency current-limiting devices are recommended for use.

Caution: Needle monitoring electrodes are not recommended.

Caution: Patient should not come into contact with earthed metal parts, the use of antistatic sheeting is recommended.

Caution: Cables to the surgical electrodes are recommended to be positioned such that contact with patient or other leads is avoided.

Caution: Do not continue to deliver RF for more than 30 seconds if the impedance bar is more than 75% filled and temperature is not increasing.



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of un-insulated "dangerous voltage" within the products enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The symbol with an open book with the letter "i" is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the unit.



The symbol with a person reading an open book is intended to alert the user to read and understand the operator's manual prior to use. Failure to follow instructions could result in death or serious injury.

6. ENVIRONMENTAL PROTECTION:

Follow local governing ordinances and hospital practice regarding the disposal of the SpineSTAR Ablation Instrument (see SpineSTAR Ablation Instrument IFU)

7. HOW SUPPLIED:

The MetaSTAR RF Generator is supplied in a semi-ready-to-use state. The units' box contains the MetaSTAR RF Generator, and a detached power cord. All other devices are available separately.

7.1. Accessories:

7.1.1. Hand Switch Cable

7.1.2. AE Cable

7.2. Single Use Devices – See below for other devices required for Tumor Ablation.

SpineSTAR Ablation Instrument*

* Applied Part, V_{PPMax} : Same as **Output**. See Appendix A, I. Specifications.

8. DEVICE PREPARATION:

8.1. Cleaning the MetaSTAR RF Generator

Clean the MetaSTAR RF Generator prior to use with a damp cloth and water, isopropyl alcohol, 1.5% hydrogen peroxide, or a mild bleach solution after each use. Prolonged exposure to any corrosive solvents or disinfectants should be avoided.

8.2. Device Set Up

Examine the unit for damages prior to use. DO NOT use a damaged device.




































Verify that the unit is fully operational prior to use.

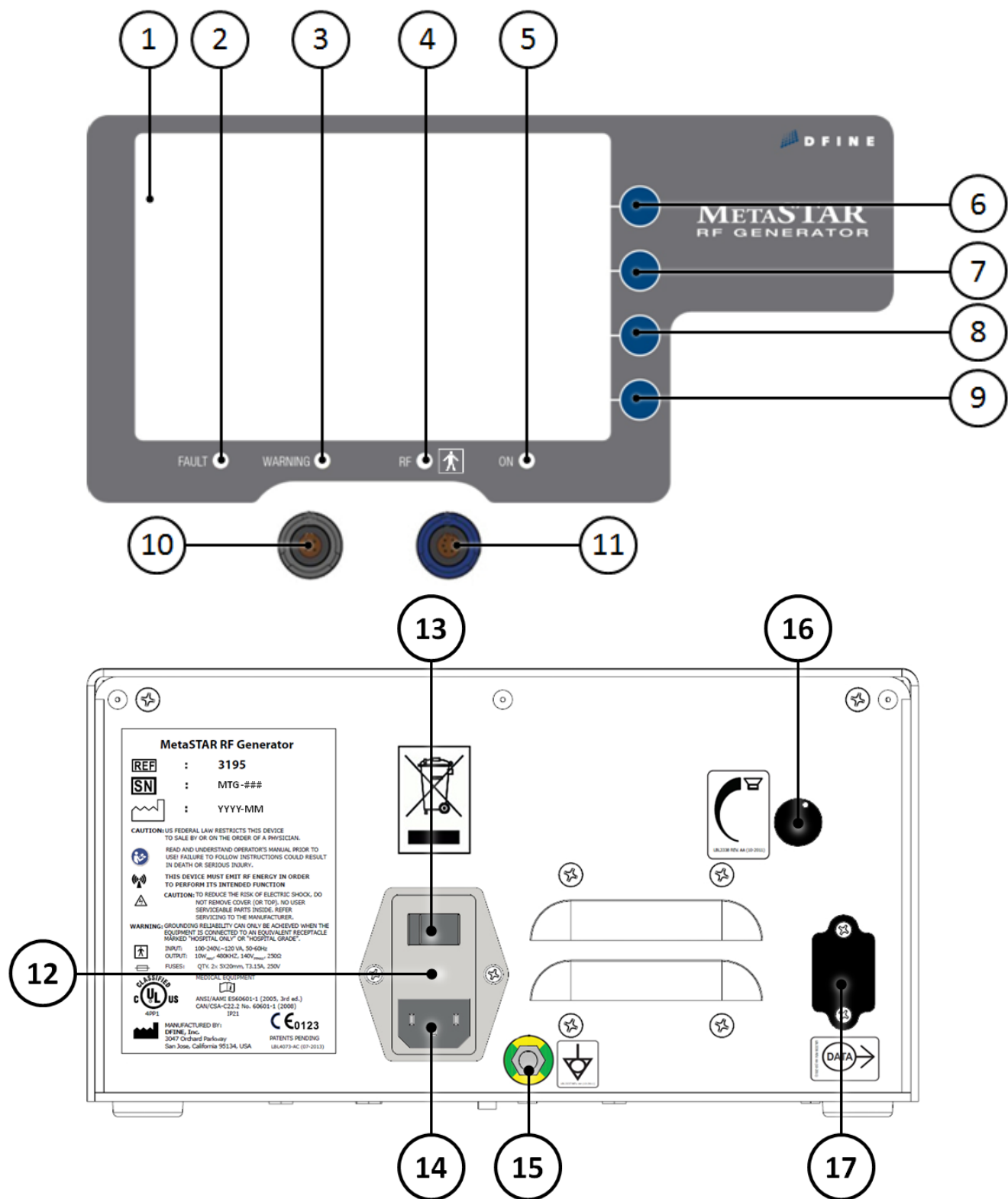
Connect the power cord to the Power Socket (8.2) on the back of the MetaSTAR RF Generator and to an electrical outlet. The power requirements for the MetaSTAR RF Generator are located on the label on the back of the unit.

Turn on the MetaSTAR RF Generator power and see if it passes self-test prior to use. Examine the SpineSTAR Ablation Instrument, AE Cable, and Hand Switch Cable prior to use. DO NOT use a damaged device.

Make sure that at least one disposable SpineSTAR Ablation Instrument, Hand Switch Cable, and AE Cable are available as backup, prior to use.

8.3. MetaSTAR RF Generator Nomenclature & Symbols

	"ON" (power)		Type BF Applied Part		Volume Control
	"OFF" (power)		Warning, electricity		Up Arrow
	Non-ionizing electromagnetic radiation		Reset Cycle		Down Arrow
	Equipotentiality		Reset All		Data Output
	Protective Earth Termination		RF Off		RF Icon on display
	Fuse		Confirm	 <p>UL Classified Medical Equipment with respect to electrical shock, fire and mechanical hazards only in accordance with ANSI/AAMI ES 60601-1 (2005, 3rd ed.), IEC 60601-1, CAN/CSA C22.2 No. 60601-1 (2008), IEC 60601-2-2 (2009)</p>	
	Caution (see Instruction for Use)		Use By Date		Keep dry
	Consult instructions for use		Do not use if package is damaged		Consult accompanying documents for system disposal
	Read and understand operator's manual prior to use! Failure to follow instructions could result in death or serious injury.		Keep away from sunlight		Sterilized using Irradiation
	Serial Number		Date of Manufacture		Temperature limit
	Catalog Number		Manufacturer		Fragile, handle with care
	Do no re-use		Authorized Representative in the European Community		



Indicators and Sockets

1. Graphical Display	6. Soft Key Button 1	12. Fuse Drawer
2. FAULT RED LED	7. Soft Key Button 2	13. ON/OFF Main Switch
3. WARNING YELLOW LED	8. Soft Key Button 3	14. Power Socket Equipotential
4. RF ON BLUE LED	9. Soft Key Button 4	15. Ground Lug
5. POWER ON GREEN LED	10. Hand Switch Cable Socket	16. Speaker Volume Knob
	11. AE Cable Socket	17. Data Output Port

9. INSTRUCTIONS FOR USE:

9.1. Initiation

Once the device *Preparation* (8.0) is complete and power is turned on using the *ON/OFF Main Switch* at the back of the MetaSTAR RF Generator, the system performs a self-check. All LEDs and pixels on the graphics display will be on and the speaker will sound for a few seconds upon initiation (Power-On Tone). In case an error is detected during Self-Test the Fault or Warning LED will turn on and the Fault or Warning Tone will sound.

NOTE: The Hand Switch Cable can be inserted in the Hand Switch Cable Socket prior to powering up the MetaSTAR RF Generator.

After self-check is performed, the software versions are displayed.

9.2. Setting Ablation Cycle Time

Upon completion of the self-check the generator will go to the set Ablation Cycle Time Screen. In the Ablation Cycle Time Screen pressing the Up and Down Arrow Buttons will increase or decrease the RF Cycle time. Once the desired time is selected, pressing the Confirm Button will enter the time and advance to the Main Procedure Screen. During operation (below), the user can re-set the Ablation Cycle Time by pressing and holding the Reset Cycle Button for 2seconds.

9.3. Operation

SpineSTAR Ablation Instrument and AE Cable

“Connect Device” will flash until the SpineSTAR Ablation Instrument is connected to the MetaSTAR RF Generator. The SpineSTAR Ablation Instrument should be connected to the AE Cable socket on the MetaSTAR RF Generator using the AE Cable (inspect the AE Cable for damage). If the SpineSTAR Ablation Instrument is connected properly, Distal and Proximal temperature readings will display.

Hand Switch Cable

The Hand Switch Cable should be inspected and inserted into the Hand Switch Cable socket on the MetaSTAR RF Generator.

The MetaSTAR RF Generator will display the following information:

1. RF Cycle: Displayed at the top left portion of the Generator Display in minutes:seconds. (00:00)
2. Cycles: Displayed at the top center portion of the Generator Display in number of cycles (00) performed.
3. RF Total: Displayed at the top right portion of the Generator display in minutes:seconds (00:00) format. This value represents the cumulative time RF power has been delivered.
4. Distal TC: Displayed in (°C): Temperature of the Distal Thermocouple of the SpineSTAR Ablation Instrument.
5. Proximal TC: Displayed in (°C): Temperature of the Proximal of the SpineSTAR Ablation Instrument.
6. Ω (Impedance): Displayed as a box filling from bottom to top on bottom left of Generator's display.
7. Power: Displayed in (Watts): Ablation RF output power of the MetaSTAR RF Generator.

RF Power Level

This generator has four power settings, 3w, 5w, 7.5w and 10w.

The selected output power should be as low as possible for the intended purpose. Certain devices or accessories may present SAFETY HAZARDS (See WARNINGS and PRECAUTIONS above). Set the power level to 5W and modify during procedure as required to create thermal distribution for the major and minor diameter as displayed in *Figure 1*.

Ablation Zone Dimensions

The below table depicts the ablation zone sizes for each device:

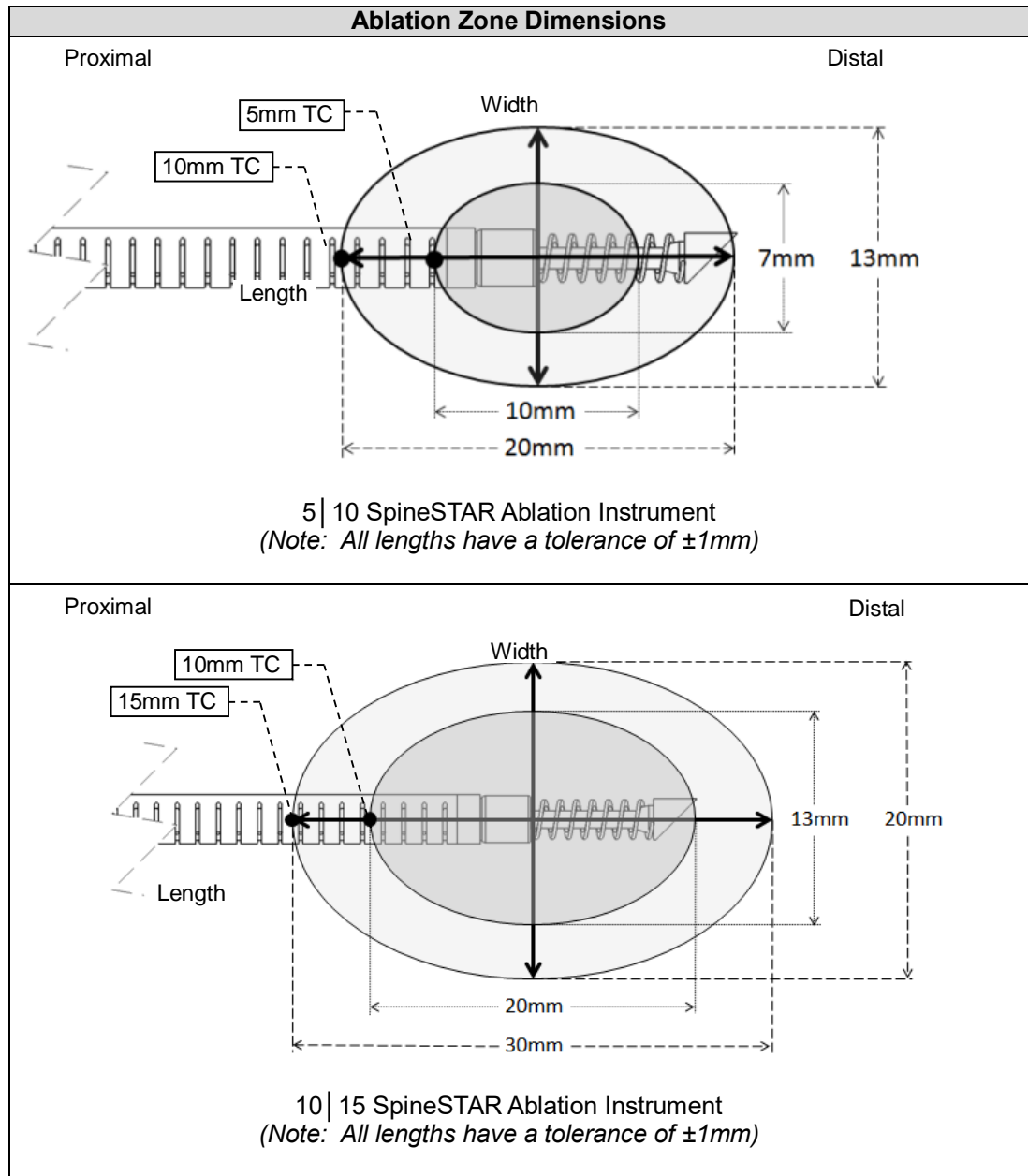


Figure 1: Ablation Zone

Caution: Excessive ablation may create heat within the spine and adjacent neural tissue.

STAR Tumor Ablation Procedure

By pressing the BLUE button on the hand switch, the user can start ablation when the SpineSTAR Ablation Instrument is properly placed:

1. Both thermocouple temperatures are displayed in amber ($\geq 30^\circ\text{C}$). Note, temperatures are displayed in blue when temperature is $<30^\circ\text{C}$.
2. Electrode is extended to the desired location (impedance is within range).

During RF delivery, a RF Enable tone will sound. If the temperature for proximal TC is greater than 45°C , High Temperature tone will replace the normal RF tone.

The user can stop RF delivery by pressing the Blue button on the hand switch again.

RF will also automatically turn off if any of the following criteria are met:

1. RF Cycle Time reaches 00:00.
2. Maximum tissue impedance (1000Ω) is achieved.

3. Proximal Thermocouple (TC) on the SpineSTAR Ablation Instrument reaches 50°C.

The RF Cycle Time can be reset to the pre-set value by pressing and releasing the Reset Cycle Button.

The RF Total Time, number of Cycles, and RF Cycle Time can be reset together by pressing and holding the Reset All button for 2 seconds.


Completion of Procedure

Turn off MetaSTAR RF Generator using the power button. Unplug the controller from the electrical outlet (Mains) and remove the power cord from the back of the controller.

10. PREVENTIVE MAINTENANCE, TROUBLESHOOTING AND REPAIR:

10.1. Adjusting Volume

The MetaSTAR RF Generator has an adjustable volume control (Section 8.2 item 16) on the back of

the unit.  Twisting the adjustor clockwise will increase the volume.

10.2. Maintaining Device Effectiveness

In the event of a blown fuse, only 5x20mm 3.15A/250VAC Type "T" (slow blow) fuses should be used as replacements. Turn power off and disconnect the power cord from the electrical outlet. Remove fuse holder by opening the Power Entry Module's Fuse Drawer (Section 8.2 item 12) on the back of the MetaSTAR RF Generator. Replace both fuses.

Besides the fuses there are no other user serviceable parts. No servicing or preventive maintenance is required for this device. For servicing, replacement or repair, return cleaned unit (9.3) to manufacturer.

11. CUSTOMER SERVICE AND TECHNICAL SUPPORT, WARRANTY:

11.1. Customer Service

Contact MERIT's Customer Service for any customer or technical support.

Call +1-800-356-3748 or e-mail us at customerservice@merit.com.

11.2. Limited Warranty

Merit Medical Systems, Inc. ("MERIT") warrants to the original purchaser of the MetaSTAR RF Generator ("MetaSTAR RF Generator") that the MetaSTAR RF Generator will be free of defects in material and workmanship for a period of one year after the date of purchase when used as intended under normal operating conditions and in conformance with their instructions for use and maintenance instructions. The sole obligation of MERIT under this warranty shall be limited to the replacement of the MetaSTAR RF Generator or equivalent models, at no charge to the original purchaser and at the option of MERIT, during the warranty period but only if examination reveals to the satisfaction of MERIT that the MetaSTAR RF Generator contains a defect in material or workmanship.

This warranty is made in lieu of all other warranties, expressed, implied or statutory, including, but not limited to the implied warranties of merchantability and fitness for a particular purpose and all other obligations and liabilities on the part of MERIT. MERIT neither assumes nor authorizes any other person to assume for it any other liability in connection with the sale of the MetaSTAR RF Generator. This warranty shall not apply to MetaSTAR RF Generator or any other part thereof that has been subject to accident, negligence, alteration, abuse, or misuse. MERIT makes no warranty whatsoever with regard to accessories or parts used in conjunction with the MetaSTAR RF Generator and not supplied and manufactured by MERIT.

The term "original purchaser," as used in the warranty means that person or organization and its employees, if applicable, to whom the MetaSTAR RF Generator was sold by MERIT. This warranty may not be assigned or transferred in any manner.

In order to make a warranty claim, the original customer must obtain a Return Good Authorization Number ("RGA Number") and return instructions from MERIT's Customer Service Department or authorized representative. The allegedly defective MetaSTAR RF Generator must be returned, cleaned, repackaged, clearly marked with the RGA number on all packaging, and adequately insured, to the following address: Merit Medical Systems, Inc., 1600 West Merit Parkway, South Jordan, Utah 84095 U.S.A. A written statement must also be included that reasonably describes the defect(s) with the MetaSTAR RF Generator and indicates the appropriate return address to ship the replaced MetaSTAR RF Generator, as well as a copy of a receipt showing proof of purchase.



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APPENDIX A PRODUCT SPECIFICATIONS

I. Specifications

Mode of Operation: Continuous
Input: 100-240VAC, 50-60Hz, 120VA
Dimensions: 6 "(H) x 11"(W) x 18"(D) (15 x 28 x 46cm)
Weight: 6.6 lbs (3kg)
Output: 10W_{MAX}, 480kHz, 140V_{PPMax} 250Ω load
Fuses: 5x20mm 3.15A/250VAC Type "T" (time-lag) (Qty. 2)
Weight and dimensions indicated are approximate. Specifications are subject to change without notice.

II. Protection

Class 1, Type BF, continuous operation; Enclosure IP 21

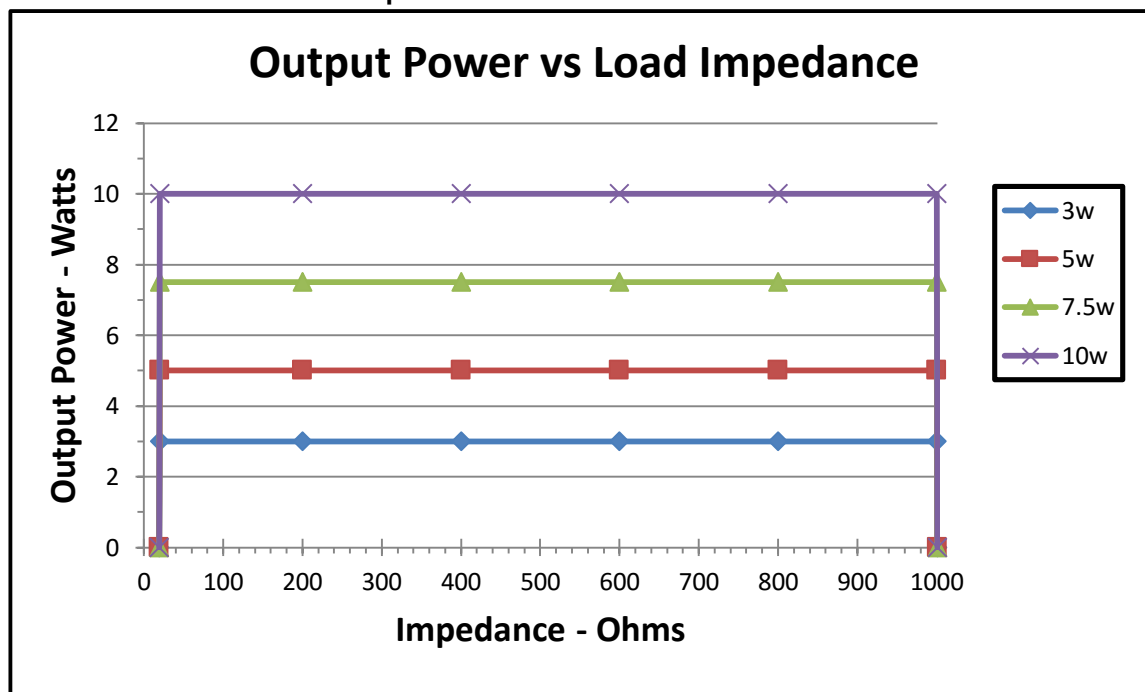
III. Operating Conditions

Temperature: 59°F to 104°F (15°C to 40°C)
Relative Humidity: 30% to 75% non-condensing
Atmospheric Pressure: 878 to 1082cmH₂O (86 to 106kPa)
Whenever the temperature goes above 50°C or below 10°C and the MetaSTAR RF Generator is in Standby or RF Enabled mode, it goes into a thermal shut down.

IV. Transport and Storage Requirements

Temperature: 0°F to 104°F (-18°C to 40°C)
Relative Humidity: 10% to 90% non-condensing

V. Tumor Ablation Mode Output Power



APPENDIX B ELECTROMAGNETIC ENVIRONMENT GUIDANCE

Electromagnetic Environmental Guidance			
Electromagnetic Emissions			
The MetaSTAR RF Generator and SpineSTAR Ablation Instrument are intended for use in the electromagnetic environment specified below. The customer or the user of the System should assure that it is used in such an environment.			
Emissions test	Compliance	Environmental guidance	
RF emissions CISPR 11	Class A		
Harmonic emissions IEC 61000-3-2	Class A		
Voltage fluctuations/ flicker emissions IEC 61000-3-3	AC Input		
The System does not require interconnection with other equipment.			
Portable and mobile RF communications equipment can affect operation of the System.			
The System intentionally radiates RF in normal operation.			
Electromagnetic Immunity			
The MetaSTAR RF Generator and SpineSTAR Ablation Instrument are intended for use in the electromagnetic environment specified below. The customer or the user of the System should assure that it is used in such an environment.			
Immunity test	IEC 60601 test level	Compliance level	Environmental guidance
Electrostatic discharge (ESD) IEC 61000-4-2	Contact: ±2kV, ±4kV±6kV Air: ±2kV, ±4kV ,±6kV ±8 kV	Per test level	
Radiated RF Electromagnetic Fields IEC 61000-4-3	80 to 1000Mhz 3V/m AM 80% 3 sec dwell	Per test level	
Electrical fast transient/burst IEC 61000-4-4	Test at AC Port for both 230Vac/50hz and 120Vac/60hz input voltages	Per test level	
Surge IEC 61000-4-5	Test at AC Port for both 230Vac/50hz and 120Vac/60hz input voltages	Per test level	
Conducted disturbances, Induced by RF Fields IEC 61000 -4 -6	0.15Mhz to80Mhz 3V/m AM 3 sec dwell	Per test level.	
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11 UT = 230 Vac	Test at AC Port for both 230Vac/50hz and 120Vac/60 hz input		
Power frequency (50 Hz) magnetic field IEC 61000-4-8	Test at AC Port for both 230Vac/50hz and 120Vac/60hz input 3A/m	Per test level	

APPENDIX C ABBREVIATIONS

LED	Light Emitting Diode
RF	Radio Frequency

APPENDIX D CONFORMANCE TO STANDARDS

The MetaSTAR RF Generator conforms to the following International Standards:

- EN 60601-1 Medical Electrical Equipment. Part 1: General Requirements for Basic Safety and Essential Performance
- AAMI ES 60601-1 Medical Electrical Equipment. Part 1: General Requirements for Basic Safety and Essential Performance
- CSA C22.2 No. 60601-1 Medical Electrical Equipment. Part 1: General Requirements for Basic Safety and Essential Performance
- IEC 60601-1-2 Medical Electrical Equipment, Part 1-2: Collateral Standard: Electromagnetic Compatibility
- IEC 60601-2-2 Medical Electrical Equipment, Part 2-2: Essential Performance Particular Requirements for the Basic Safety and Essential Performance of High Frequency Surgical Equipment and high frequency surgical accessories
- ANSI/AAMI/ISO 15223 Graphical Symbols for Use on Equipment
- EN 60529 Degrees of Protection Provide by Enclosures (IP Code)
- ANSI/AAMI ES-1 Safe Current Limits for Electro medical Apparatus
- ASTM D4169 Standard Practice for Performance Testing of Shipping Containers & Systems
- EN 55011 (CISPR 11) Limits and Methods of Measurement of Electromagnetic Disturbance Characteristics of Industrial, Scientific, and Medical (ISM) RF Equipment
- MDD 93/42/EEC Medical Device Directive (Council Directive Concerning Medical Devices)

APPENDIX E COMPATIBLE POWER CORDS

Continental Europe, 2.0m, 10A, Inter Power PN 86231000

Argentina, 2.5m, 10A, Inter Power PN 86270010

Brazil, 2.5m, 10A, Inter Power PN 86286110

China, 2.5m, 10A, Inter Power PN 86517040

India / South Africa, 2.5m, 10A, Inter Power PN 86265010

Israel, 2.5m, 10A, Inter Power PN 86275010

Italy, 2.5m, 10A, Inter Power PN 86394000

Japan, 2.3m, 7A, Inter Power PN 86589000

Switzerland, 2.5m, 10A, Inter Power PN 86285010

United Kingdom / Ireland, 2.5m, 10A, Inter Power PN 86240060

Hospital-Grade

Australia/New Zealand, 2.5m, 10A, Inter Power PN 86210140

Denmark, 2.5m, 10A: Inter Power PN 86280810

North America, 3.0m, 10A Inter Power 86610710 rev B

APPENDIX F TONES

- **Power On** – Speaker: 250Hz for 75ms, 300Hz for 100ms, 400Hz for 100ms, 500Hz for 80ms, 530Hz for 100ms, 600Hz for 100ms, 750Hz for 100ms, 900Hz for 100ms, 100ms silence, 1000Hz 110ms five times within 5 seconds, 1000Hz for 500ms tone once at power up.
- **RF Enabled** – Speaker: 300Hz for 200ms – once every two seconds when RF energy is delivered in Ablation Mode.
- **Fault** - High Priority tone.
- **Warning** - Medium Priority tone.
- **Button Click** - The tone pattern shall be the following: 1000Hz for 20ms.
- **Temperature High** – Speaker: 600Hz for 200ms – once every two seconds when RF energy is delivered in Ablation Mode and the corresponding TC reading is above 45 °C.

APPENDIX G INDICATORS / ERROR CODES AND TROUBLESHOOTING

- In event of Hand Switch Cable failure – e.g. Hand Switch is stuck – remove Hand Switch Cable connector from MetaSTAR RF Generator.
- If stuck in “ON” position turn off MetaSTAR RF Generator.
- In the event of a thermal shut down (ambient temperature is above 50°C or below 10°C) the MetaSTAR RF Generator stays in Warning mode until temperature returns to normal operating conditions. Resolve by turning off and on when temperature is between 10°C-50°C.
- This equipment has been tested and found to comply with the limits for medical devices to the IEC 60601-1-2. These limits are designed to provide reasonable protection against harmful interference in a typical medical installation. This equipment generates; uses and can radiate radiofrequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to other devices in the vicinity. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to other devices, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
 - Reorient or relocate the receiving device.
 - Increase the separation between the equipment.
 - Connect the MetaSTAR RF Generator to an electrical outlet on a circuit different from the affected equipment.
- In case of unsuccessful Self-Test FAULT LED or WARNING LED will be on, continuous alarm Fault or Warning Tone – Requires System Restart.
- In case of Error State, the unit will remain in that Fault or Warning condition until the unit is switched off using the MAIN ON/OFF POWER SWITCH.
- In the event the MetaSTAR RF Generator does not recognize the SpineSTAR Ablation Instrument it will flash “Connect Device.”

Warnings and Fault Messages

Warning Messages displayed on MetaSTAR RF Generator

All the Warning messages follow the basic form below:

Example of Warning message (in Yellow outlined triangle and text):

Warning 30

Fault Messages displayed on MetaSTAR RF Generator

All the Fault messages follow the basic form below:

Example of Fault message (in Red outlined triangle and text):

Fault 31

Provided below is a list of Warning and Fault messages, listed in ascending order.

Message Number	Fault (F) / Warning (W)	What Fault Message Means	User Actions
28*	W	Load impedance too high, RF circuits getting hot.	Turn Power off for 10 minutes to let generator cool down. Turn Power back on. If error persists, contact MERIT Customer Service.
29	F	RF power level too high during treatment	Turn Power off. Turn Power back on. If error persists, contact MERIT Customer Service.
30	W	Impedance Power On Self Test	Turn Power off. Turn Power back on. If error persists, contact MERIT Customer Service.
31	F	RF Power On Self Test	Turn Power off. Turn Power back on. If error persists, contact MERIT Customer Service.
32	F	24V Supply Power On Self Test	Turn Power off. Turn Power back on. If error persists, contact MERIT Customer Service.
33	F	12V Supply Power On Self Test	Turn Power off. Turn Power back on. If error persists, contact MERIT Customer Service.
34	F	-12V Supply Power On Self Test	Turn Power off. Turn Power back on. If error persists, contact MERIT Customer Service.
35	F	5V Supply Power On Self Test	Turn Power off. Turn Power back on. If error persists, contact MERIT Customer Service.
36*	W	Temperature Power On Self Test	Turn Power off until temperature is between 50°C-10°C. Turn Power back on. If error persists, contact MERIT Customer Service.
37	F	SPI Power On Self Test	Turn Power off. Turn Power back on. If error persists, contact Customer Service.
38	F	Cold junction compensator Power On Self Test	Turn Power off. Turn Power back on. If error persists, contact MERIT Customer Service.
39	F	Watchdog Fault	Turn Power off. Turn Power back on. If error persists, contact MERIT Customer Service.
41- 53	W	RAM Power On Self Test	Turn Power off. Turn Power back on. If error persists, contact MERIT Customer Service.
60 - 66	W	Display Graphic	Turn Power off. Turn Power back on. If error persists, contact MERIT Customer Service.
70	F	EEPROM Power On Self Test	Turn Power off. Turn Power back on. If error persists, contact MERIT Customer Service.
71	F	DAC or ACD Power On Self Test	Turn Power off. Turn Power back on. If error persists, contact MERIT Customer Service.
72	W	Display Initialization Power On Self Test	Turn Power off. Turn Power back on. If error persists, contact MERIT Customer Service.
73	F	CPU Configuration Power On Self Test	Turn Power off. Turn Power back on. If error persists, contact MERIT Customer Service.
74	F	CRC Power On Self Test	Turn Power off. Turn Power back on. If error persists, contact MERIT Customer Service.
75*	W	Stuck or Shorted Panel Buttons or Hand Switch Buttons	Turn Power off. Push all buttons once. Turn Power back on. If error persists, contact MERIT Customer Service.
80 - 86	W	Display Graphic	Turn Power off. Turn Power back on. If error persists, contact MERIT Customer Service.
95	F	"Fault and Warning Alarm" Power On Self Test	Turn Power off. Turn Power back on. If error persists, contact MERIT Customer Service.
96	W	Tone Generator Software Version	Turn Power off. Turn Power back on. If error persists, contact MERIT Customer Service.
97	F	"Fault and Warning Alarm" Watch Dog	Turn Power off. Turn Power back on. If error persists, contact MERIT Customer Service.
98	F	"Fault and Warning Alarm" Processor or Program	Turn Power off. Turn Power back on. If error persists, contact MERIT Customer Service.
* Recoverable-system error, follow instructions listed in User Actions column.			