



INSTRUCTION MANUAL

3800 RF Generator

And

3808/3806MOD, 3809/3807MOD

Handheld Sealing Heads

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Introduction

Document Scope

Use this manual as a guide for the setup, adjustment and operation of the model 3800 RF generator with the 3808/3806MOD, 3809/3807MOD handheld sealing head. The information in this user manual is based on technical data that has been verified and validated by Vante.

Intended Audience

This manual is intended for skilled personnel who understand the procedures for welding and forming thermoplastic materials. Users assume any risks associated with setup and operation of this product. Use model 3800 RF generator with sealing heads at your own discretion.

Application

The 3800 RF generator supplies radio frequency (RF) energy to a peripheral device, such as a handheld sealing heads to perform the required operation. The Sealing head welds tubing and film made of RF-reactive thermoplastic materials, including polyurethane (PU), polyvinylchloride (PVC), ethylene vinyl acetate (EVA), certain types of nylons and certain co-extrusions. Tubing may be filled with non-flammable liquid; however, the outside of the tubing must always be clean and dry.

Exclusions and Limits of Liability

Vante makes no warranties, expressed or implied, and assumes no liability in connection with any use of this information. Vante assumes no liability or obligation nor guarantees product performance. The contents of this manual are not to be construed as license to operate under, nor a recommendation to infringe upon, any patents.

Proprietary Information

All rights are reserved. Copying of the protected designs associated with the 3800 / 3808/3806MOD, 3809/3807MOD system is strictly prohibited without the prior written consent of Vante.

User Alerts

Throughout this document, WARNINGS, CAUTIONS, and NOTES notify the reader of important and critical information.

WARNING: A warning indicates a condition or procedure that could cause bodily harm. Warnings are enclosed in bold-line boxes.

CAUTION: A caution indicates a condition or procedure that could result in damage to the unit. Cautions are enclosed in thin-line boxes.

NOTE: A note indicates important, useful information.

Safety symbols



Warning, hot surface



Warning, crush hazard



Warning, RF burns



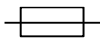
Warning, risk of electric shock



Warning (general)



Protective Earth (PE)



Fuse



On



Off

CE Marking Information

For inquiries related to the CE marking of this product, please contact Vante at:
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1. Description

1.1. The RF Forming/Welding System

The RF generator is the foundation of a sealing, forming, and/or welding system. The generator supplies RF energy to a peripheral sealing head that is used to process RF-reactive thermoplastic materials. The peripheral component of the system controls the generator.

Vante offers many off-the-shelf peripheral devices with diverse features that can be used for most applications. Vante also offers engineering support for those who design their own custom peripherals.

Custom peripherals must incorporate a matching network provided by Vante.

Vante will provide all of the components needed to support custom peripherals, such as controllers, coaxial cables, interface cables, footswitches, matching network, forming/welding heads, etc., at additional cost.

1.2. Theory of Operation

The System uses RF energy to seal, form, and weld certain types of thermoplastic. The thermoplastic must be an RF-sensitive dielectric. The RF energy heats the thermoplastic, allowing the material to change shape and bond, depending on the type of force applied. When the material cools under the applied force, it retains its new shape or bond.

The 3800 RF generator produces RF power at a maximum of 200W. The frequency is controlled by a solid state oscillator/amplifier operating at 40.68 ± 0.020 MHz. The peripheral sealing head component applies force to a material throughout the heating and cooling phases of the process.

The operator controls the dwell time and clamp time, so one system can process various materials and tubing sizes.

1.3. Operator Safety

WARNING: Vante recommends strict adherence to the procedures specified in these user manuals. Misuse or modification of an instrument may result in unsafe or hazardous situations.



The forming system is designed to be used in a controlled manufacturing environment by trained personnel. The system applies RF equipment to form and weld thermoplastic tubing or parts.

Vante RF devices meet or exceed appropriate electric safety standards. These devices pose no electrical shock hazard when used with properly fused and grounded outlets. Refer to section 5 for additional information on RF safety.

WARNING: This Vante product is designed for indoor use only.

WARNING: Do not use the peripheral sealing head to process tubing that contains flammable liquid or hazardous materials.

1.4. Specifications

Table 1.1 Specifications

Mechanical				
Dimensions:	Width	Length	Height	Weight
3800 generator	17¾ in / 43 cm	16 in / 41 cm	5 ¼ in / 13 cm	30 lb (14 kg)
Dimensions:	Width	Length	Height	Weight
3806MOD Sealing Head	8.5 in / 21.6 cm	7.25 in / 18.4 cm	2 in / 5 cm	2.5 lb (1.1 kg)
3807MOD Sealing Head	10 in / 25.4 cm	7.75 in / 19.7 cm	2.5 in / 6.4 cm	3.9 lb (1.8 kg)
Electrical				
Power input	115 VAC, 6.3A, 50/60 Hz 230 VAC, 4A, 50/60 Hz			
RF power output	Fixed: 150 – 200W			
Main AC power fuses	2 × 250 VAC, 5 × 20 mm T6.3A 2 × 250 VAC, 5 × 20 mm T 4A			
Operating conditions				
Temperature	8 – 38°C			
Humidity	90% relative humidity, non-condensing			

2. System Setup

2.1. Diagrams

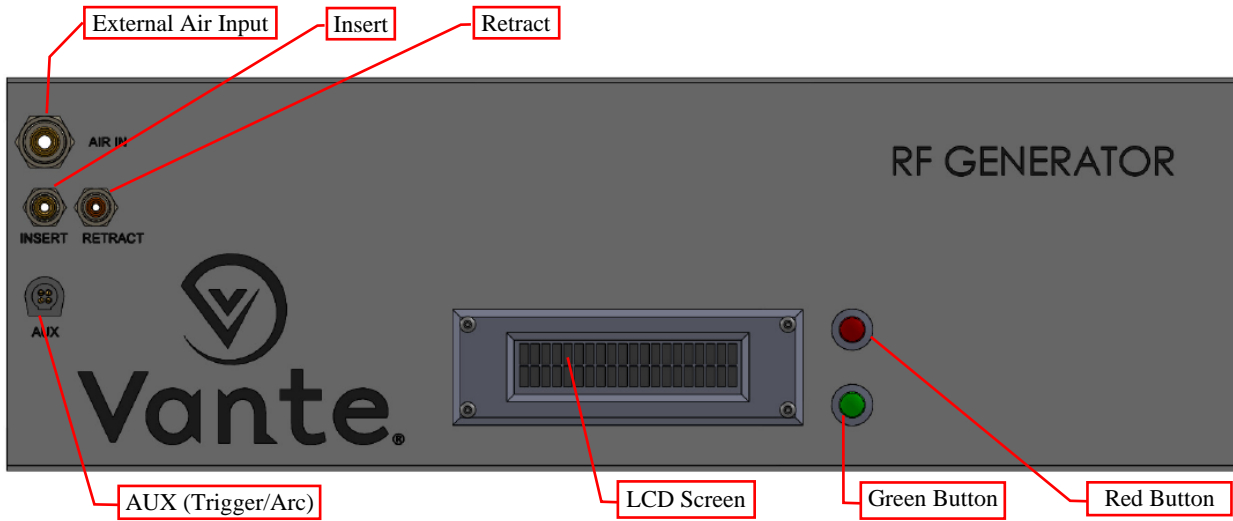


Figure 2.1 3800 RF generator, front view

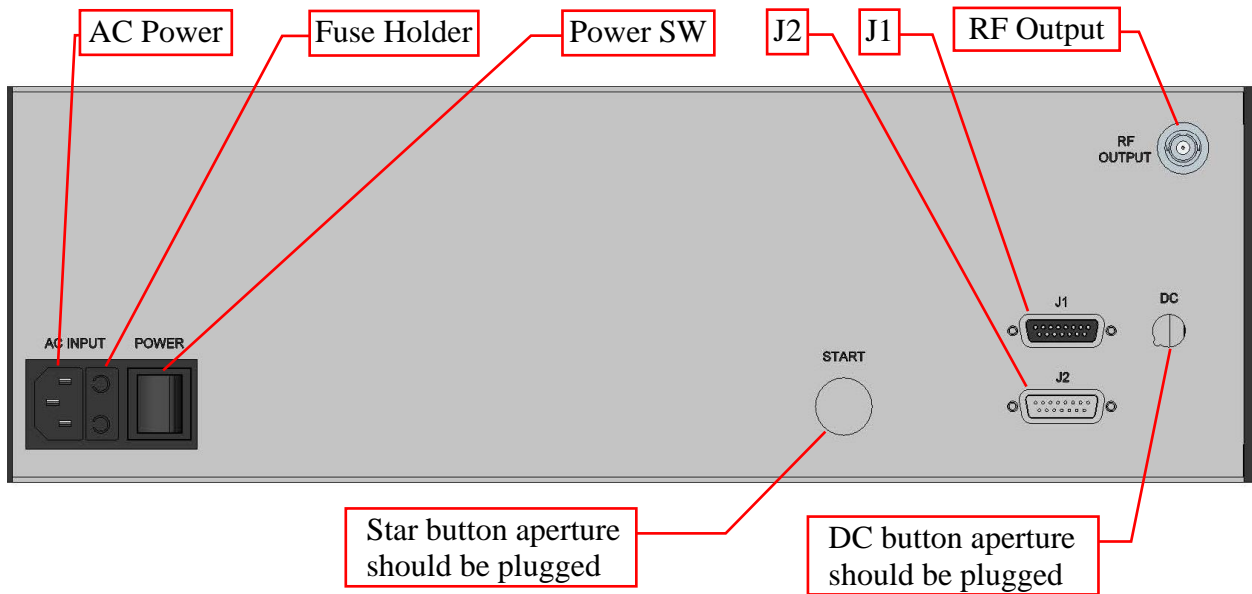


Figure 2.2 3800 RF generator, rear panel

230 VAC, 50 Hz, 4A FUSE T4A, 250 VAC (X2)	115 VAC, 60 Hz, 6.3A FUSE T6.3A, 250 VAC (X2)
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Figure 2.3 Fuse labels

WARNING: To avoid personal injuries or equipment damage use specified fuses only.

2.2. Uncrating

- 2.2.1. Remove the RF generator and peripheral components from their shipping cartons. Inspect all components for damage. If any components are damaged, contact Vante.
- 2.2.2. The serial plate indicates the model number and serial number of the unit. Refer to the serial number when contacting Vante or one of its authorized service centers.
- 2.2.3. Verify that the supplied power cable is compatible with your facility’s power supply. Contact Vante if necessary to request a different power cable.

CAUTION: Do not connect the power cable to AC mains at this time.

CAUTION: Do not cover the top or side vents of the RF generator. Overheating can occur, damaging the internal components.

WARNING: Do not **insert** or **remove** the AC power cord with the power switch in the **ON** (|) position.

WARNING: User must provide means to isolate air supply. 60 – 100 PSI max

WARNING: Keep fingers clear of the sealing head jaws—injuries can occur from crushing or RF burns.




CAUTION: Severe damage to the sealing head electrodes occurs if fingers are introduced between sealing head clamps.

2.3. Installation—Handheld Sealer (Sealing Head)

2.3.1. System:

- Verify power OFF the 3800 generator.
- Connect the external airline, to the AIR IN port on the generator. See figure 2.1.
- Connect the air lines from the handheld sealer to the INSERT and RETRACT ports on the generator. See Figure 2.1

2.3.2. Connect the coaxial cable from the sealing head to the BNC port (RF Output) on the generator. See Figure 2.2.

	<p>The 3800 Generator is supplied with an 8ft BNC to BNC RF Coaxial Cable specifically designed for use with this device. Use of other BNC to BNC RF Coaxial Cables (longer or shorter) will effect the performance of the connected Sealer. Use only Vante P/N 11030000 Coaxial cables.</p>
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2.3.3. Connect the 4-pin plastic connector on the control cable assembly from the sealing head to the RF generator's AUX port. See Figure 2.1.



Figure 2.5 Model 3806MOD (3807MOD is the large size version) midsize tube sealer

2.4. Power On

2.4.1. Switch the power switch to ON (|). See Figure 2.2

2.4.2. The LCD screen and the exhaust fan activate.

NOTE: Transistor electronics allow the RF generator to start operating as soon as it is powered on; there is no warm-up period.
If the generator fails to power on, refer to section 4.2.

2.4.3. The LCD screen displays the device name, model number, and software version. After a short delay, the system enters an idle state. The LCD screen says “Ready.” See Figure 2.6.

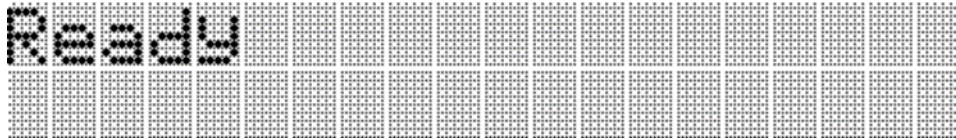


Figure 2.6 LCD screen, idle state

NOTE: If the LCD screen says, “Not Ready,” the generator cannot be triggered.

2.5. Generator Controls

2.5.1. The internal controller is programmed to control the RF energy intervals and sequence.

2.5.2. The green and red buttons are used to adjust program parameters.

2.5.3. The generator is activated by the activation switch on the peripheral device.

3. System Operation

3.1. Running a Cycle

WARNING: Keep fingers and other objects clear of the electrodes and the coaxial connector in the peripheral sealing head when processing materials. Severe burns, RF injuries, and/or crush injuries may occur. Do not use this system to seal tubing that contains flammable or other hazardous materials.



CAUTION: Improper use can severely damage the generator and/or sealing head.

Always keep fingers and other objects clear of the electrodes in the sealing head to avoid injuries and damaging the electrodes.

Never squeeze the trigger without tubing between the jaws. Damage to the sealing jaws and poor sealer operation can result.

- 3.1.1. Ensure that the 3800 generator is in an idle state. The LCD screen says “Ready.” See Figure 2.6
- 3.1.2. Ensure that the materials being processed are clean and dry.
- 3.1.3. Position the materials in the sealer jaws as shown in Figure 3.1. The tube positioner is a visual indicator which helps the operator create consecutive seals with consistent spacing between them. The knob of the tube positioner can be loosened so the positioner can be easily adjusted by the end-user to a desired distance from the sealing region. Then, after the first seal is completed, the operator can visually line the center of that seal up with the radius on the end of the tube positioner. This will set the tube in a position for the next seal to be conducted at the specified distance from the first seal. The range the tube positioner can be set from is 1.75” to 2.5” between seals.



Figure 3.1 Sealer operation

- 3.1.4. Pull the trigger on the handheld sealing head.
- The LCD says “Sealing.” See Figure 3.2.

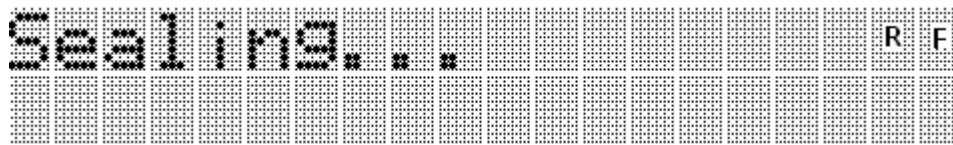


Figure 3.2 LCD screen, sealing state

- 3.1.5. Continue holding the trigger until the sealing cycle is complete.

NOTE: Four conditions can terminate a cycle before it is complete:

- Releasing the trigger on the handheld sealing head.
- Pressing the red button on the generator.
- Loss of the ready signal.
- Automatic detection of an arc (a message displays on the LCD screen).

If the cycle is interrupted, RF energy is cut off, but the sealing head remains closed for the duration of the post delay time.



WARNING: Allow the material to cool before proceeding.

3.1.6. Once the cycle ends, the generator returns to an idle state.

NOTE: When spacing seals, make sure that the distance between seals is **at least 10 times the diameter of the tubing**. Seals that are too close together can cause segments to rupture.

3.2. Accessing the Internal Controller

3.2.1. Ensure that the generator is in an idle state. The LCD screen says “Ready.” See Figure 2.6.

3.2.2. Press the green button and red button at the same time until the LCD screen changes to the password entry screen. See Figure 3.3.

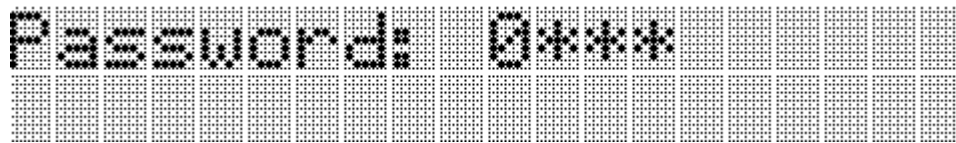


Figure 3.3 LCD password entry screen

- The password is a 4-digit numeric code. One digit is active at a time; the remaining three are masked with * characters.
- 3.2.3. Press the green button to increment the active digit. Press the red button to decrement the active digit.
- 3.2.4. Press and hold the green button to activate the next digit (to the right). Press and hold the red button to activate the previous digit (to the left).
- 3.2.5. Press and hold the green button and the red button at the same time to submit the password.
- If the entered password is correct, the LCD screen shows the system configuration screen.
 - If the entered password is incorrect, the generator returns to an idle state.

NOTE: The default password is 0000. To change the password, refer to section 3.5.2.

3.3. Programming the Internal Controller

- 3.3.1. After a valid password is entered, the LCD screen shows the system configuration screen. See Figure 3.4.

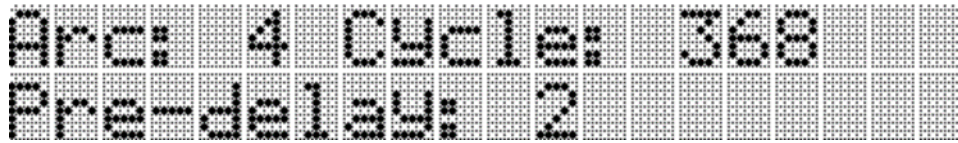


Figure 3.4 LCD system configuration screen

- 3.3.2. The following parameters are programmable:
- *Pre-delay*: number of seconds after a cycle is triggered, before RF energy is activated. The maximum setting is 2.

NOTE: The sealing head closes during the pre-delay.

- *EOS-delay*: number of seconds RF energy is activated. The maximum setting is 5.
- *Post-delay*: number of seconds after RF energy is deactivated, before the material is released. The maximum setting is 5.

NOTE: The material cools during the post-delay. Releasing the material too soon can affect the seal quality.

- *Clear counters*: reset the arc and cycle counters to zero. See 3.5.1.
- *Change password*: set a new password. See 3.5.2.

NOTE: The arc and cycle counters remain visible during programming.

- 3.3.3. To adjust the value of the pre-delay, EOS-delay, or post-delay, use the green button to increment the value or the red button to decrement the value.
- 3.3.4. Press and hold the green button to change to the next parameter. Press and hold the red button to change to the previous parameter.
- 3.3.5. Press and hold the green button and the red button at the same time to enter the new values and return the generator to an idle state.

3.4. Process Development

WARNING: Keep fingers and other objects clear of the electrodes in the peripheral when processing materials. Do not touch the coaxial connector connected to the sealing head when RF energy is being applied. Severe burns, RF injuries, and/or crush injuries may occur.

Do not use this system to seal tubing that contains flammable or other hazardous materials.



CAUTION: Improper use can severely damage the generator and/or sealing head.

Always keep fingers and other objects clear of the electrodes in the forming/welding head to avoid damaging the electrodes.

NOTE: Vante may recommend process settings for computer and manual controls; however, users are responsible for determining the control settings that work best for their application(s).

- 3.4.1. Run an initial sealing cycle to establish baseline results.
- 3.4.2. Use the internal controller (see section 3.3) to adjust the RF timing.
- 3.4.3. Run a second cycle to determine how the settings changes affect the seal quality.
- 3.4.4. Continue to check and adjust until the settings produce the desired results.

3.5. System Adjustments

- 3.5.1. To reset the arc and cycle counters, navigate to the configuration screen (see 3.2).
Cycle through the process parameters (pre-delay, EOS delay, and post delay) until the LCD displays “CLEAR COUNTERS.”
Use the red and green buttons to select YES.
Press and hold both the green and red buttons to finish.

NOTE: Clearing the counters resets both the arc and cycle counters to zero. There is no way to recover this information after it is cleared.

- 3.5.2. To change the password, navigate to the configuration screen (see 3.2).
Cycle through the process parameters (pre-delay, EOS delay, post delay, and clear counters) until the LCD displays “CHANGE PASSWORD.”
Use the red and green buttons to select YES. Press and hold the green button.
The LCD screen changes to the password entry screen. See Figure 3.3.

The password is a 4-digit numeric code. One digit is active at a time; the remaining three are masked with * characters.

Press the green button to increment the active digit. Press the red button to decrement the active digit.

Press and hold the green button to activate the next digit (to the right). Press and hold the red button to activate the previous digit (to the left).

Press and hold the green button and the red button at the same time to submit the new password.

4. Maintenance and Repair

4.1. Cleaning

WARNING: Turn off the generator and disconnect all cords and cables before cleaning. RF burns can occur if the generator is connected to power.

- 4.1.1. Ensure the fan intake and air exhaust ports are free of dust. Use air to clean, or moisten a cloth with isopropyl alcohol and wipe away any dust.

CAUTION: Only use isopropyl alcohol and clean, dry air for cleaning. Other solvents or liquids can damage the generator.

NEVER submerge the sealing head in any liquid. Liquid damage voids the warranty on the sealing head and damages the jaws.

- 4.1.2. Keep the electrodes in the sealing jaw and tubing clean and dry. To clean the electrodes, use a cotton swab and isopropyl alcohol. Ensure that electrodes are completely dry before operating the sealing head.
- 4.1.3. If tubing material adheres to the electrodes, or if they become corroded, a mild abrasive cleaner, such as Soft Scrub® can be used to clean the electrodes. Apply the Soft Scrub® gently with a cotton swab. Remove the Soft Scrub®

4.2. Repair

WARNING: To avoid electrical shock, disconnect the system from its power source before servicing.



Only use replacement fuses with the rating specified on the generator fuse label. Refer to Figure 2.3.

- 4.2.1. For all repairs other than fuse replacement, refer to section 4.3, below.
- 4.2.2. Replace the fuses if the generator fails to power on when connected to a power source with the power switch in the on (I) position.
- 4.2.3. Remove the power cable.
- 4.2.4. Release the fuse holder by using a flat head screwdriver to press the detent. Slide the fuse holder out to expose the fuses.

NOTE: If the fuses are not blown, return them to the fuse holder and check the other connections.

- 4.2.5. Replace blown fuses with identical fuses. Refer to the fuse label for details.
- 4.2.6. If the fuses blow frequently, contact Vante.

4.3. Returning a Unit for Service

- 4.3.1. Do not attempt any repairs on the 3800 RF Generator with the 3808/3806MOD, 3809/3807MOD system, other than replacing a fuse. If the generator malfunctions, contact Vante.
Notify Vante that you need repair or maintenance services before you return the product. Be prepared to tell the Vante service representative the model number and serial number of the device. These numbers are printed on the device label.
- 4.3.2. **CERTIFICATION:** Annual certification of the 3800 RF Generator with the 3808/3806MOD, 3809/3807MOD System is highly important and highly recommended by Vante. The certification includes the verification of the proper system operation following Vante's internal protocols. Contact Vante for instructions on annual certification.
- 4.3.3. Vante will issue a Return Material Authorization (RMA) number for the service order.
- 4.3.4. Ship the device to Vante in the original shipment container, if possible. If you are unable to use the original shipment container,
- Wrap each component separately in plastic bubble wrap, or any packing material capable of protecting the components from impact.
 - Place the components in a protective shipping container. Use more than one container if necessary.

CAUTION: Components that are damaged in shipping will incur additional repair costs.

4.4. Disposal of Equipment

Dispose of this equipment in accordance with local government practices for electronic equipment. Contact your appropriate government agency to obtain disposal procedures, or contact Vante engineering.

5. Radio Frequency System Safety Considerations



5.1. Introduction

Vante manufactures a variety of instruments that use radio frequency (RF) for sealing, welding, and forming thermoplastics. Typical uses include the sealing of PVC and EVA tubing, and plastic welding or forming in manufacturing processes. When in operation, these RF instruments emit radio frequency energy to people, other instruments, and equipment located in close proximity. Vante RF instruments operate at a frequency authorized by the Federal Communications Commission (FCC) and the International Telecommunications Union (ITU) for industrial, scientific, and medical (ISM) use. The following is an advisory regarding RF instrument use and associated safety considerations.

5.2. RF Effects on Human Tissue

Misuse or direct contact between tissue and RF contacts can result in RF burns.

5.3. RF Effects on Pacemakers

There is no evidence that Vante RF instruments interfere with the function of modern cardiac pacemakers.

5.4. Electrical Safety

Vante RF devices meet or exceed appropriate electrical safety standards, and pose no electrical shock hazard when used with properly fused and grounded outlets.

5.5. RF Effects on Electronic Equipment

Vante instruments produce RF power, and during operation they emit some RF energy. While most modern electronic equipment and instruments provide shielding from RF energy, improperly shielded electronic devices operating in close proximity to an RF instrument may be affected. If interference is suspected, appropriate electronic shielding, moving equipment further away from the RF instrument, or operating the devices on different electrical circuits may be necessary.

5.6. RF Effects in Potentially Explosive Atmospheres

Do not operate Vante RF instruments in any area with a potentially explosive atmosphere. It is possible for the RF electrodes to arc, initiating an explosion or fire.

Appendix: Controller Interface

The RF generator is controlled by a peripheral device, usually a handheld sealing head.

NOTE: The J1 and J2 ports on the generator are not used.

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