

InnoVet® VERSA Radiographic System

OPERATOR'S MANUAL

Part Number 07168 Rev. J

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Introduction

Congratulations!

You are the proud owner of an InnoVet® VERSA veterinary x-ray system. The VERSA system was engineered by InnoVet® to meet the needs of the modern veterinary practice.

Because the VERSA system is so unique, its features and functions are a bit different from traditional x-ray systems.

The purpose of this manual is to familiarize you with your new InnoVet® VERSA, and guide you through the safe operation and maintenance of your new system.

Should a situation arise which cannot be resolved through the troubleshooting procedures described in this manual, please contact the InnoVet® dealer who installed your machine for assistance.

Customer Support Contacts

This information is provided to help you establish safe operating conditions for both you and your X-ray system.

If you are unable to reach your InnoVet® Dealer, you may contact Summit Industries to find the best resource:

Mail: Customer Support Department
Summit Industries LLC
7555 N. Caldwell Ave.
Niles, IL 60714

Telephone: (800) 729-9729 or (773) 588-2444

Fax: (773) 588-3424

Attention: Customer Support Department

Online: www.InnoVet4vets.com

Specifications

Electrical Ratings:

24VDC, 1A (4-way float top versions only)

Mechanical Ratings:

Max. safe working load (patient weight): 300 lbs (136kg)

Max. safe working load of tube and collimator mass: 70 lbs (32kg)

Applicable Standards:

This X-ray generator complies with the following regulatory and design standards.

- UL 60601-1
- CAN/CSA C22.2 NO601.1
- X-RAY EQUIPMENT IEC 60601-2-7
- Degree of protection against harmful ingress of water: IPXO/Ordinary.
- Degree of protection against electric shock: Class I
- Mode of operation: Continuous operation with intermittent loading (standby - exposure).
- Equipment not suitable for use in presence of a FLAMMABLE ANESTHETIC MIXTURE WITH AIR OR WITH OXYGEN OR NITROUS OXIDE.

- Degree of protection against electric shock is Type B.



While most Summit X-ray Generators are UL Classified, some are not. UL Classified X-ray Generators will display a UL Classified label on the rear surface of the X-ray Generator's Power Module. To determine if an X-ray Generator is UL Classified, please examine the rear surface of the Power Module looking for the UL mark as shown below:



OUTPUT PARAMETERS

kVp range:	40 to 125 kVp
kVp steps:	variable in 1 kVp steps
kVp accuracy:	± (5% of selected kVp + 1 kVp)
Rise-time (10-90%):	≤ 4 ms
mAs accuracy:	± (10% of selected mAs + 1 mAs)

GENERATOR OUTPUT POWER	
(Note: Actual power varies depending on strength of end user power line)	
GEN. MODEL	POWER
00210 -016 thru -020, -050 02968 -009, -010	20kW
00210 -000 thru -015, -035 thru -039, -051 thru -054, -056 thru -061, -064, -065 02968 -001 thru -008, -011, -012, -015 thru -017, -019 03900 -022, -025, -026, -028 thru -031, -034 thru -036	30kW
00210 -040 thru -049, -066 thru -069 03900 -003, -004, -011, -012, -023, -024, -027, -037, -038	40kW
00210 -030 thru -034, -062, -063 02968 -013, -014, -018 03900 -007, -008, -015, -016	42kW
03901 -008 thru -011	50kW

MAS STATIONS		
GEN. MODEL	SMALL FOCAL SPOT	LARGE FOCAL SPOT
00210 -002,-005, -009,-014,-017, -019,-020,-050, -051 02968 -001,-007, -010,-012,-015, -019	0.5, 0.6, 0.7, 0.8, 0.9, 1.0, 1.2, 1.4, 1.7, 2.0, 2.5, 3.0, 3.5, 4.0, 5.0, 6.0, 7.5, 9.0, 10, 12, 15, 18, 20, 22, 26, 30, 35, 40, 45, 50, 55, 60, 65, 70, 80, 100	1.0, 1.2, 1.4, 1.7, 2.0, 2.5, 3.0, 3.5, 4.0, 5.0, 6.0, 7.5, 9.0, 10, 12, 15, 18, 20, 22, 26, 30, 35, 40, 45, 50, 55, 60, 65, 70, 80, 100, 120, 140, 160, 200, 240, 280, 300, 340, 400
00210 -000,-007, -016,-018 02968 -003,-005, -009,-011	0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0, 1.2, 1.4, 1.7, 2.0, 2.5, 3.0, 3.5, 4.0, 5.0, 6.0, 7.5, 9.0, 10, 12, 15, 18, 20, 22, 26, 30, 35, 40, 45, 50, 55, 60, 65, 70, 80, 100	0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0, 1.2, 1.4, 1.7, 2.0, 2.5, 3.0, 3.5, 4.0, 5.0, 6.0, 7.5, 9.0, 10, 12, 15, 18, 20, 22, 26, 30, 35, 40, 45, 50, 55, 60, 65, 70, 80, 100, 120, 140, 160, 200, 240, 280, 300, 340, 400
00210 -001,-003, -006,-008,-010, -015,-030 thru -049,-052 thru -054,-056 thru -071 02968 -002,-004, -006,-008,-013, -014,-016 thru -018 03900 -*** 03901 -***	0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1.0, 1.1, 1.2, 1.4, 1.6, 2.0, 2.1, 2.2, 2.4, 2.5, 2.6, 2.8, 3.0, 3.2, 3.4, 3.6, 3.8, 4.2, 4.4, 4.8, 5.0, 5.3, 5.6, 6.0, 6.3, 6.7, 7.1, 7.5, 8.0, 8.5, 9.0, 9.5, 10.0, 10.5, 11.0, 12.5, 14.0, 15.0, 16.0, 17.0, 18.0, 19.0, 20.0, 21.0, 22.0, 24.0, 25.0, 26.0, 28.0, 32.0, 34.0, 36.0, 38.0, 40.0, 42.0, 45.0, 48.0, 50.0, 53.0, 56.0, 60.0, 63.0, 67.0, 71.0, 75.0, 80.0, 85.0, 90.0, 95.0, 100	1.0, 1.1, 1.2, 1.4, 1.6, 2.0, 2.1, 2.2, 2.4, 2.5, 2.6, 2.8, 3.0, 3.2, 3.4, 3.6, 3.8, 4.2, 4.4, 4.8, 5.0, 5.3, 5.6, 6.0, 6.3, 6.7, 7.1, 7.5, 8.0, 8.5, 9.0, 9.5, 10.0, 10.5, 11.0, 12.5, 14.0, 15.0, 16.0, 17.0, 18.0, 19.0, 20.0, 21.0, 22.0, 24.0, 25.0, 26.0, 28.0, 32.0, 34.0, 36.0, 38.0, 40.0, 42.0, 45.0, 48.0, 50.0, 53.0, 56.0, 60.0, 63.0, 67.0, 71.0, 75.0, 80.0, 85.0, 90.0, 95.0, 100, 105, 110, 120, 125, 130, 140, 150, 160, 170, 180, 190, 200, 210, 220, 240, 250, 260, 280, 300, 320, 340, 360, 380, 400, 420, 450, 480, 510, 540, 570, 600

Available MA and TIME Stations		
Generators	mA Stations	Time Range
00210 -002,-005,-009,-014,-017,-019, -020,-050,-051 02968 -001,-007,-010,-012,-015, -019	50S, 100S 150L, 200L, 250L, 300L	Small: 0.005 - 2.000 seconds Large: 0.004 - 2.667 seconds
00210 -000,-007,-016,-018 02968 -003,-005,-009,-011	50S, 100S 100L, 300L	Small: 0.004 - 2.000 seconds Large: 0.004 - 4.000 seconds
00210 -001,-003,-006,-008,-010,-015, -030 thru -049,-052 thru -054,-056 thru -071 02968 -002,-004,-006,-008,-013,-014, -016 thru -018 03900 -*** 03901 -***	50S, 100S 200L, 300L, 350L, 400L, 450L, 500L	Small: 0.004 - 2.000 seconds Large: 0.004 - 3.000 seconds

ENVIRONMENTAL SPECIFICATIONS

OPERATING

Ambient temperature ranges: 50°F (10°C) to 104°F (40°C)

Relative humidity: 30% to 75%

Atmosphere pressure ranges: 20.67 inHg (700hPa) to 31.30 inHg (1060hPa)

TRANSPORT AND STORAGE

Ambient temperature ranges: -40°F (-40°C) to 158°F (70°C)

Relative humidity: 10% to 90%

Atmosphere pressure ranges: 14.67 inHg (500hPa) to 31.30 inHg (1060hPa)



WARNING:

Due to the corrosive nature of processor chemicals, it is strongly urged that the film processor is not installed in the same room as the x-ray equipment. See the processor manual for recommendations on venting requirements for the darkroom and processor installation.

This information is provided to help you establish safe operating conditions for both you and your X-ray generator.

Do not operate this X-ray except in accordance with information included in this section, and any additional information provided by the X-ray generator manufacturer and/or competent safety authorities.

Major Components of the VERSA



- k) X-Ray Tube Head
- l) X-Ray Tube
Angulation Dial
- m) X-Ray Tube
Handle
- n) Collimator
- o) Tubestand Handles
- p) Tubestand
- q) Animal
Restraints/Cleats
- r) Cassette Storage
Bin*
- s) Rust-proof support
feet
- t) Exposure Foot
Treadle*
- u) Upper Front Panel
- v) X-Ray Table Top
- w) User Console
- x) Exposure
Footswitch

* Optional Feature

Major Components of the VERSA DR



Getting Started

Power Switch

Press the ON button on the user control panel.



It is a good idea to turn the unit off at the end of each day. This ultimately will extend your system's life.

Warm up

It is highly recommended that you warm up the unit prior to the first higher-powered exposure to prolong tube life.



To Warm-Up VERSA take a series of three exposures using the 300 mA station. Start with a kVp of 70 and increase to 80; then 90. Exposures should be 30 mAs and spaced at least 20 seconds apart.

Non-DR Versa systems:

Storing Cassettes

Cassettes can be stored in the optional storage bin or bins mounted to either side of the table. There is no danger of cassette fogging due to scatter radiation.



Although the storage bin is lead-protected, it will not protect film from fogging after excessive exposure.

Loading Cassettes

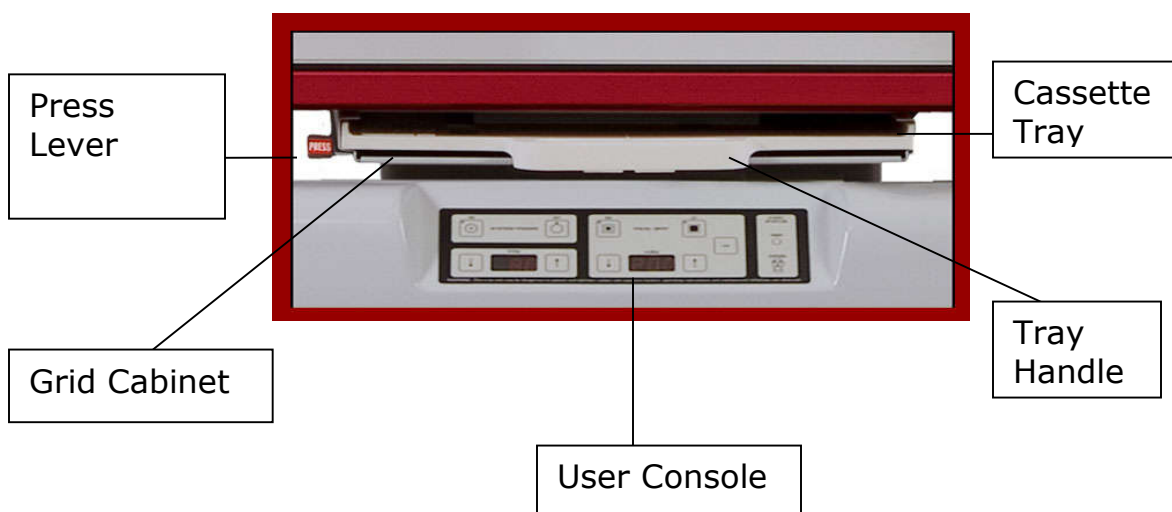
Three sizes of cassettes can be used; 8" x 10", 10" x 12" and 14" x 17". Simply position the cassette into the specially-formed grooves of the receptor holder. It will accept the cassette either lengthwise or crosswise.

Positioning

Float Top Table (option)

1. Release the float top by moving your finger over the release switch located on the underside of each front corner of the table.
2. Grasp any corner of the table and move the table to desired location. The table will lock in place when you release your hands.
3. To release table, push the same button again.

Non-DR Versa systems:



Grid Cabinet - Engaged

The grid/grid cabinet can be moved in tandem with the tubestand, assuring alignment of the primary beam to the center of the film. The grid cabinet can be positioned anywhere along the entire length of the table, by grasping the tubestand handles and moving the tubestand to the desired location.

Grid Cabinet - Disengaged

Alternatively, the grid cabinet may be moved independent of the tubestand.

1. Release the interlock from the grid cabinet by pushing the "PRESS" lever.
2. The grid cabinet may then move while the tubestand remains stationary.
3. To re-engage the interlock, position grid cabinet in-line with tubestand.
4. The interlock is engaged when you hear a metallic "click" sound and feel the interlock mechanism move into place.

Tube Positioning

The tube can be moved from 9-1/2" to 40" above the table top. For convenience, the two SID markers indicate 40" positions from grid cabinet.

During vertical motion, you will note a pause at one height, which is the pre-set height for optimal exposure, set by adjusting the detents during setup and calibration. If you prefer another pre-set height (detent position) contact your InnoVet dealer.

Tube Angulation

1. Release the Tube Angulation lock, at the base of the collimator by rotating it counter clockwise.
2. Grasp the U-Shaped handle bars and rotate the tube to proper angle.
3. Turn the lock handle clockwise to hold tube position. The degree of rotation is indicated by the dial located between the handle bars.

Versa DR Software Operation

Please see the QXvue User Manual either in the included acquisition computer or the software CD for instructions on the digital software operation.

Collimator Operation

Light Field

Press the light button on the front of the collimator to activate the light field.

If you have selected VERSA with the Hands-Free Collimator Light option, you can lightly tap the table base from either side to engage the light.



DO NOT LOOK DIRECTLY INTO LIGHT SOURCE AS RETINA DAMAGE COULD RESULT.

Programmable Lamp Times

The lamp gradually turns off in one of the following times: 30, 60, 90, or 120 seconds. The factory default setting is 90 seconds.



Contact your InnoVet dealer to change the default lamp times.

As light dims, depress the light switch again to extend the light time. When the no-hands option is chosen, tap the table base with your foot to turn the light back on.

Shutter Adjustment

- Use the adjustable sliding knobs to adjust the shutter dimensions.
- The scales on the sliding knob will indicate the light field size at the table top.
- Use the sliding knobs to move shutters.
- The scales on the sliding knob should correspond to your desired image area.
- Use the pointer to quickly move shutters into relative position, then fine tune to collimate beam to area of radiographic interest.



Limiting the size of the x-ray beam to the area of anatomical interest improves image quality and patient safety by reducing scatter radiation.

Swivel movement

When doing table top work, you may want to swivel the collimator to avoid awkward patient positioning. The collimator has a soft mechanical detent that indicates the 90° position. For other positions simply rotate the collimator by grasping the sides and turning.



You will note that the collimator hesitates at the 0° and 90° positions. This is in order to help find this position accurately.

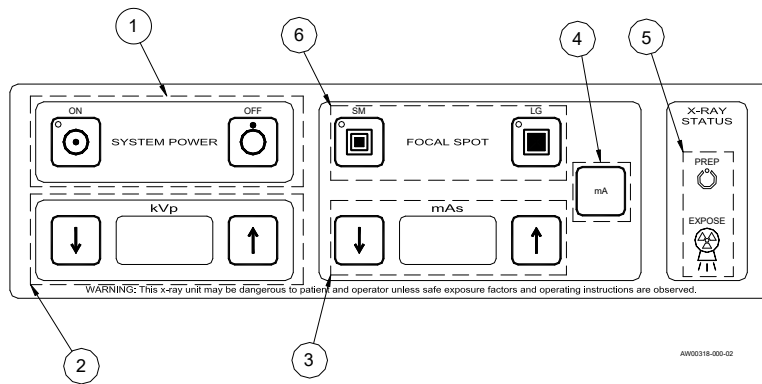
User Console: kVp/mAs

Before taking an x-ray exposure, it's important that each user become familiar with the User Console Settings and their function.

The Versa system comes standard with 2 point (kVp and mAs) technique selection. If your Versa came with optional Anatomical Programming, please see that section for instructions.

Standard User Console (2-Point) Buttons

1. Power ON and OFF
2. kVp Control
3. mAs Control
4. mA Indicator Light
5. Prep, X-Ray Exposure Buttons
6. FOCAL SPOT Selection Buttons



1. POWER ON, POWER OFF

Press the "ON" button to turn the x-ray generator on. A green LED will be lit when the unit is on. The console will light up and a brief self-check will be performed upon power-up. Approximately 1-2 seconds after power-up the digital display will indicate the software version.

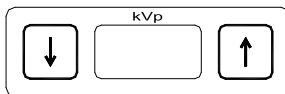


Press the "OFF" button to turn the generator off. If desired, the system can be programmed to turn itself off automatically. It can be set for 1 to 10 hours in one hour increments, or disabled. Contact your InnoVet dealer to program this feature.

2. kVp CONTROL

The kVp digital display will indicate the kVp selected. Press the UP and DOWN arrow buttons to scroll through the available kVp selection.

Continuously depressing the buttons will allow the kVp to increase/decrease one kV every 1/2 second for five (5) steps and then accelerates to approximately ten (10) steps per second.



4. mA INDICATOR

Press the mA button to view the mA station to be used for the mAs selected. The mA will appear in the mAs digital display, when the mA button is depressed.



5. FOCAL SPOT INDICATOR

The size of the X-Ray tube focal spot can be selected. Press the appropriate button to select the preferred focal spot size. A green LED will illuminate to indicate the focal spot selected.

- Press the SM button to select the small focal spot.
- Press the LG button to select the large focal spot.



6. PREP, X-RAY EXPOSURE INDICATOR

By partially depressing the exposure footswitch will begin the rotation of the tube rotor. In approximately 1.5 – 2 seconds, the prep indicator (green LED) will light-meaning you are ready to make an exposure. The exposure will start when you fully depress the exposure foot switch.



The x-ray exposure indicator (yellow LED) will light and an audible tone will sound when x-rays are being produced. If desired, the audible tone can be programmed for a duration of 0.25, 0.50, 0.75 or 1.00 second. Contact your Summit dealer to program this feature.

If the Exposure footswitch is released prior to fully depressing the footswitch, the exposure will be inhibited and the prep cycle will have to be restarted (does not apply to latching prep option).

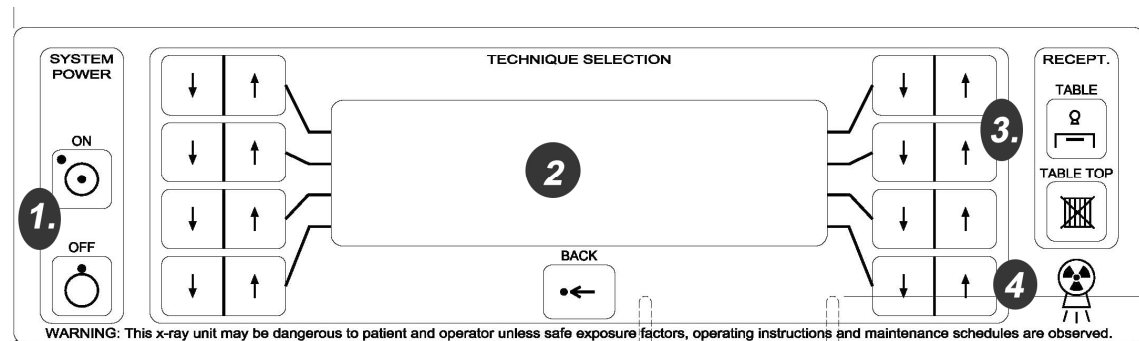
User Console: AP

Before taking an x-ray exposure, it's important that each user become familiar with the User Console Settings and their functions.

Because you have opted for Anatomical Programming (AP), your User Console is different from the kVp/mAs User Console.

USER CONTROLS

1. Power ON and OFF buttons and POWER ON indicator.
2. LCD display window, BACK button, and APR technique selection and programming buttons.
3. Table and Table-Top Image receptors
4. X-Ray Exposure Indicator



1. Power On, Power Off

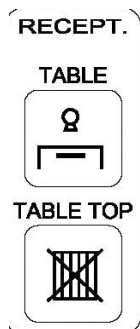


- Press ON to switch the x-ray generator on.
- A green LED will be lit when the unit is on.
- The console will light up and a brief self-check will be performed upon power-up.
- Approximately 1-2 seconds after power-up the digital display will indicate the software version.
- A GREEN LED will be illuminated while console power is on.
- Press OFF to switch the generator off.

2. LCD display window, BACK button, and APR technique selection and programming buttons.

- See "How to Take an X-Ray" section for more details.

3. Table and Table-Top Image receptors



- Press TABLE to select the table image receptor.
- Press TABLE TOP for exposures used without an image receptor.

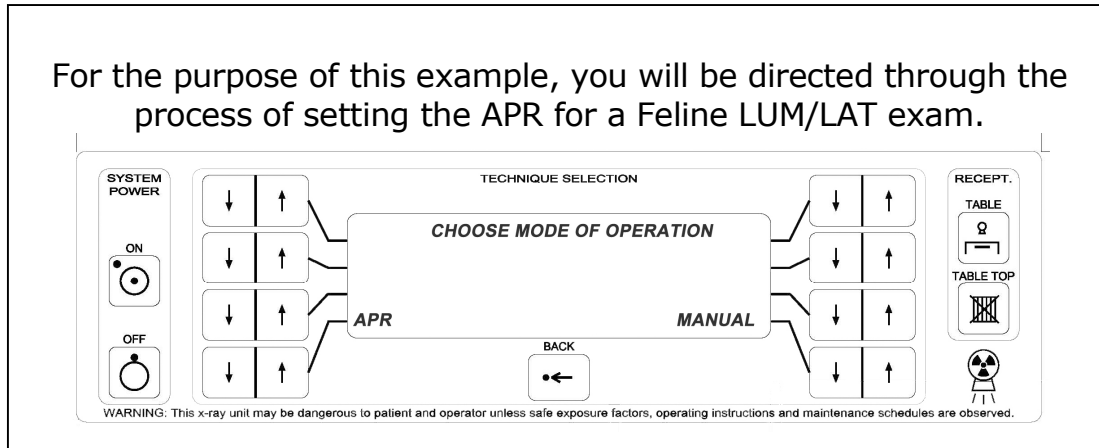
4. X-Ray Exposure Indicator



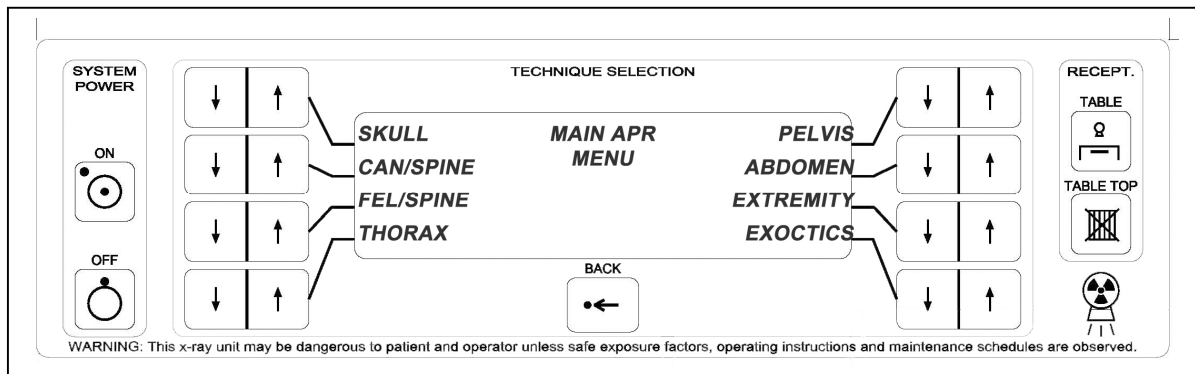
- The x-ray exposure indicator (yellow LED) will light when x-rays are being produced. You will also hear an audible tone (approximately 500ms.) when the exposure is complete.

AP Regions and Views

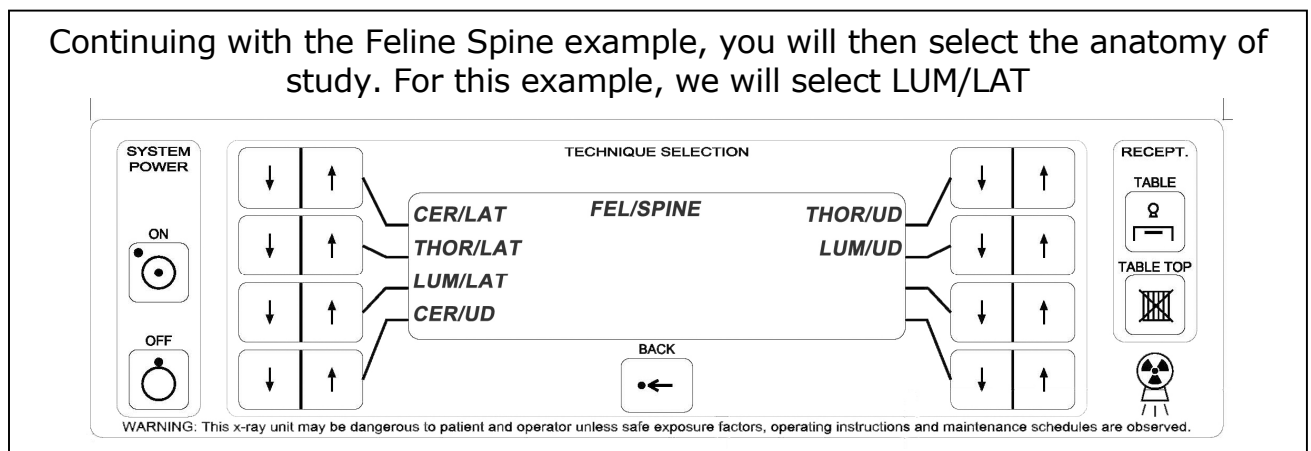
1. Power the unit by pressing the ON button.
2. The LCD window will offer you the option of APR or 2-Point programming. Select APR by pressing the lower left-hand button.



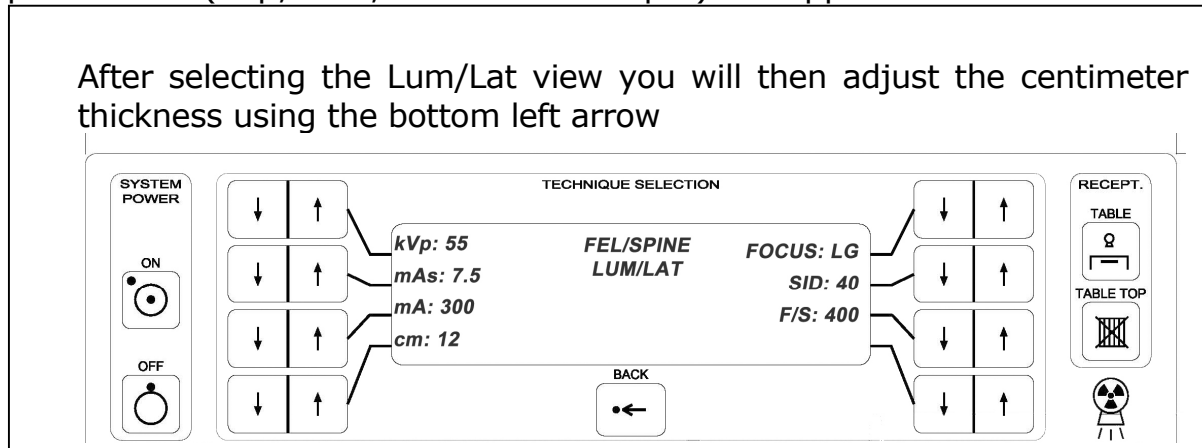
3. Select the Region by pressing the associated arrow button.



4. Once you have selected the region, select the Radiographic View by pressing the associated arrow button.




5. Once you have selected the anatomy of study, pre-programmed technique parameters (kVp, mAs, mA and Focal Spot) will appear.



6. After measuring the patient, adjust cm thickness to correspond by pressing the lower left hand button.

- NOTE: You may override the pre-programmed settings to suit your needs.
- Press the associated arrow button to override the pre-programmed value. Overriding of the programmed technique parameter does not affect the APR memory.
- When overriding a pre-programmed technique factor (kVp or mAs), an arrow will be displayed to identify that the selected value is higher or lower than the pre-programmed technique value.

 *Be sure that mA or timing adjustments are done LAST. Our generators will auto-select the appropriate time/mA for the default settings if they are not the final items adjusted.*

Setting Techniques

The generator will automatically select the highest mA and shortest exposure time available to achieve the mAs displayed.

If the exposure is terminated prior to the completion of the exposure an error code will be displayed as well as the mAs produced during the exposure. Any button may be pressed to restart the operator console.

Refer to the Error Code section of this manual for further reference.

If invalid technique exposure factors are selected, an audible tone will occur and an error code will be displayed in the digital display. For example, If the mAs selected is below the lowest possible setting, the operator console will alert the operator by means of an audible tone and error code. The generator will automatically change the mAs to the minimum allowable mAs on the large focal spot.

If the small focal spot is being selected, and the mAs selected exceeds the range of the small focal spot rating of the generator and x-ray tube, the operator console will alert the operator by means of an audible tone and error code. The generator will automatically change the mAs to the maximum allowable mAs on the small focal spot (100mAs).

Exposure Count

The HF generators keep track of how many exposures were taken. This number can be accessed by the User as follows:

kVp/mAs generators

To display exposure count:

- Press and hold **mA** button
- While holding the **mA** button, press and release the **Sm Focal Spot** button.
- The left display will show "C##", the right display will show "###". The numbers are read as follows:
 - "C12" "718" represents 12,718 exposures

To return to normal Radiographic mode:

- Wait 5 seconds.

AP generators

Start generator and select **MANUAL 2PT** mode.

The right side of LCD will display **EXP COUNT**. Press the associated button and the LCD will now show **EXP #:NNNNN** for five seconds (after which the display will go back to normal). The NNNNN represents the exposure count. For example, **EXP #:12718** represents 12,718 exposures.

To return to AP Mode, press & release the "back" button & select AP (or APR) Mode

How to Take an X-Ray

Once the machine is warmed-up, and your patient is positioned on the table you will follow these steps. It is important to note that no exposure will occur until the foot peddle is depressed (Step #5).



When taking an x-ray exposure, the operator should exercise appropriate protection and operation. X-Ray is hazardous to both patient and operator if proper operation and protection is not practiced.

1. Power the unit by pressing the ON button.
2. Turn on the collimator light and adjust the shutters to correspond to your area of interest with the sliding knobs.
3. AP Console: Select 2PT mode or AP/Region/View
4. Set techniques kVp, mAs, mA, focal spot (if needed). See "Setting Techniques" for details.
5. To make an exposure depress the Foot Switch as follows:
 - a. First, partially depress the Exposure Foot Switch until the PREP light begins to flash. This starts the tube prep cycle.
 - b. After 1 to 2 seconds the prep light will stay lit, and the tube is now ready for an exposure.
 - c. Fully depress the Foot Switch to make an exposure. The generator will instantaneously activate and sound an audible "beep" to indicate that an exposure was made.



To time an exposure (to synchronize with a patient's breathing, for example), partially depress the Exposure Foot Switch and then wait to fully depress the switch until the precise moment when exposure is desired.

As an alternative to the procedure in step 5, you may depress the foot switch and hold until the unit automatically goes through its two-second prep cycle to an exposure. Consequently, you will note a slight pause between pressing the foot switch and hearing the exposure signal.

Error Codes

The user console may display error codes on the digital displays and beep loudly during operation of the unit. This section contains a table of error codes with simple solutions that don't require a call for service.

You will see these error codes on the user console. You will also hear a loud beep alerting you that an error has occurred. When you hear this beeping, you should **release whichever button you are pressing** and reference the instructions below



If you incur an error code NOT mentioned below, you must contact your InnoVet dealer for service.

If errors are displayed, follow the advice listed under "Required Action." However, if an intermittent error code is displayed frequently during normal operation, call for service to determine the source of the error.

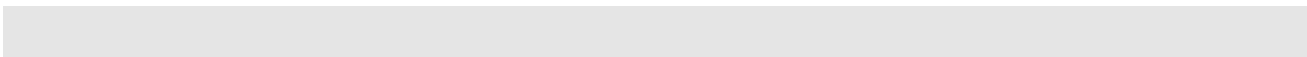
Remember, these Error Codes only apply to the VERSA ordered with the optional Anatomical Programming. Standard units have different errors codes.

INVALID SETTINGS & SELECTIONS		
ERROR	AP DISPLAY	Required Action
E01	kVp LIMIT	Adjust kVp technique parameter.
E02	mAs LIMIT	Adjust mAs technique parameter.
E03	TUBE LIMIT	Adjust kVp / mAs technique parameters.
E04	kW LIMIT	Adjust kVp / mAs technique parameters.
E05	TIME LIMIT	mA/mAs combination exceeds internal timer.
E06	TIME LIMIT	mA/mAs combination exceeds internal timer.
E07	BUTTON	Button is inactive in this setting.
E08	mA LIMIT	Highest mA is already selected.
E09	cm LIMIT	Highest or lowest cm is already selected.
E18	APR DATA LMT	Selection not available or installed during system set-up.
E19	DENSITY LMT	Highest or lowest AEC density setting is already selected.
E40	NO WALL AEC	Select the image receptor with AEC installed.
E41	NO TABLE AEC	Select the image receptor with AEC installed.
E42	NO T-TOP AEC	Select the image receptor with AEC installed.
E52	CAL DATA LMT	Selection not available or installed during system set-up.
-	TUBE ANGLE	Roll tube so x-ray beam points down to the table top.

ERROR CODES		
ERROR	AP DISPLAY	Required Action
E10	MICRO-P	Turn Operator console off and on to clear. Call for service.
E11	NO COMM.	Call for service.
E12	+/-12V LIMIT	Turn Operator console off and on to clear. Call for service.
E13	EEP R/W	Turn Operator console off and on to clear. Call for service.
E14	EEP CHECKSUM	Turn Operator console off and on to clear. Call for service.
E15	PREP PRESSED	Turn Operator console off and on to clear. Call for service.
E16	EXP PRESSED	Turn Operator console off and on to clear. Call for service.
E17	SYS COOL DOWN	Heat build-up. Wait for system to cool down before using.
E20	DOOR INTLK	Verify doors are closed during x-ray exposure. If error persists, call for service.
E21	TUBE INTLK	Heat build-up. Wait for tube to cool before using.
E22	COLMTR INTLK	Not used with manual collimation. Call for service.
E23	GENRL INTLK	Call for service.
E24	FAIL KV FB	Call for service.
E25	DC BUS LOW	Turn Operator console off and on to clear. Call for service.
E26	STILL ANODE	Call for service.
E27	ANODE ROT.	Turn Operator console off and on to clear. Call for service.
E28	PREP HELD	X-Ray prep cycle too long (20 seconds prep cycle limit).
E29	NO BUCKY MOT	Improper configuration at installation. Call for service.
E30	mA PRESENT	Turn Operator console off and on to clear. Call for service.
E31	kVp PRESENT	Turn Operator console off and on to clear. Call for service.
E32	LOW FIL AMPS	Call for service.
E33	HI FIL AMPS	Call for service.
E34	IPM OVERLOAD	Turn Operator console off and on to clear. Call for service.
E35	EXP. RELEASE	X-Ray exposure was pre-terminated by Operator due to early button release.
E36	LOW AEC RAMP	Press RESET button to clear error. Increase Back-up mAs or kVp technique parameter.
E37	kVp OVERLOAD	Call for service.

E38	mA OVERLOAD	Turn Operator console off and on to clear. Call for service.
E39	BACKUP MAS	Press RESET button to clear error. Increase Back-up mAs technique parameter.
E44	KVP TOO LOW	Call for service.
E45	NO ZCO	Call for service.
E46	KEY CODE BRD	Verify if correct Key Code board for 40 or 50 kW generators is used.
E47	TUBE NOT CALIBRATED	Call for service.
E48	KV NOT CALIBRATED	Call for service.
E49	CONSOLE RST! PLS. RELEASE PREP/EXP SW!	Release prep/expose switch.
E50	CPU ERROR! WAIT FOR RST FROM CPU	Restart digital workstation.
E51	NO MEM CARD	No memory card installed.
E53	APR CHECKSUM	Call for service.
E54	INVALID GEN MOD. NO.	Call for service.
E55	AUTO CAL FAILED	Call for service.
E56	AUTO CAL / TUBE SEASON ABORTED!	Call for service.
E57	EXPOSE HELD	Release Expose switch.
E58	mA TOO LOW	Call for service.
E59	FIL I SENSOR	Call for service.
E60	CPU ERROR! COMM. ATTACK	Restart digital workstation. Call for service.
E61	mA LOW ERROR PRE-CAL (LG)	Call for service.
E62	mA LOW ERROR PRE-CAL (SM)	Call for service.
E63	mA CAL ERROR LARGE FOCUS	Call for service.
E64	mA CAL ERROR SMALL FOCUS	Call for service.
E65	mA LOW ERROR T-SEASON CHK	Call for service.
E66	mA LOW ERROR T-SEASONING	Call for service.
E67	mA LOW ERROR SYS PWR TEST	Call for service.

E68	AC LINE VOLT NOT SELECTED	Call for service.
E69	K904 VER. NOT SELECTED	Call for service.
E70	ERR. AC LINE OR K904 VER.	Call for service.
E71	mA FEEDBACK DISABLED	Call for service.
E72	mAs LIMIT FOR 208 VAC	Call for service.
E73	MAX mA LIMIT EXCEEDED	Call for service.
E74	mA NOT CALIBRATED	Call for service.



Editing APR

(Not available on 2 PT generators)

All APR screens can be edited in the field. The menus and technique parameters can be modified and saved to memory. Once, saved to memory, all APR and calibration values can be downloaded and saved on a separate Memory Card to insure fast retrieval whenever necessary.



Only qualified personnel should have access to the edit screens, to minimize the risk of invalid or inaccurate APR technique values.

EDIT APR TECHNIQUES - Modify Technique Parameters for Radiographic Views

1. With the console power OFF, depress the BACK button.
2. While depressing the BACK button, turn the console power ON.
3. Press the associated arrow button for EDIT APR MODE.
4. By pressing the associated arrow button, select the anatomical region.
5. By pressing the associated arrow button, select the radiographic view.
6. Using the associated arrow button, select preferred mA and focal spot setting.
7. Using the associated arrow button, select the preferred SID setting.
8. Using the associated arrow button, select the preferred FILM/SCREEN speed.
9. Using the RECEPTOR button, select the preferred RECEPTOR default setting.
10. To establish the APR technique values, using the associated arrow button, select the cm START thickness measurement.
11. Using the associated UP arrow button, TOGGLE to view the cm STEP value. Using the associated arrow button, select the preferred STEP value.
12. Using the associated UP arrow button, TOGGLE to view the cm START value. Using the associated arrow buttons, select the preferred kVp and mAs value for the cm measurement displayed.
13. Using the arrow button associated with the cm value, enter the preferred kVp and mAs value for each cm value displayed. There is a total of nine (9) technique reference values to edit for each APR view.
14. To exit EDIT APR MODE, turn the console off or press the BACK button to the CAL BOOTUP screen and using the associated button, EXIT TO RAD.



When editing technique parameters, press SAVE PAGE to enter information into memory. No changes will be saved if SAVE PAGE is not selected prior to viewing a new screen/page.

EDIT APR TEXT - Text Editing

1. With the console power OFF, depress the BACK button.
 2. While depressing the BACK button, turn the console power ON.
 3. Press the associated arrow button for RENAME TECH.
 4. Using the associated arrow button with MODIFY, select the Main Menu Screen (anatomical regions) or the Region Screen (radiographic views) that requires modification.
 5. Upon displaying the preferred Screen in MODIFY, use the associated arrow button to ENTER MOD. SCREEN to edit.
 6. The text available for editing is displayed in the darkened areas. Using the associated button for SCROLL DN/UP, move the cursor (highlighted box) to the preferred text.
 7. To edit the text, use the associated button to SCROLL LT/RT through the word.
 8. Using the associated button CHANGE ALPHA, enter each letter/character to the text line. As each letter/character is modified, use the SCROLL LT/RT to continue editing the text.
 9. To exit, turn the console power off or press the BACK button to the CAL BOOTUP screen and using the associated button, EXIT TO RAD.
- To access words/text aligned on the right of the LCD window, use the SCROLL LT/RT button to move the cursor to the desired text.

STORAGE & RETRIEVAL OF APR DATA

Once APR values or text are modified and saved, Summit Industries recommends storing the new values on a digital memory card. This ensures that all the APR modifications as well as calibration information is stored external to the operator console and generator. Retrieval and reloading of the information will be fast, if the need arises.

If a Memory Card is not available, Factory Set Defaults for APR menus and technique parameters can be restored to the console's memory.

Factory Defaults

1. With the console power OFF, depress the BACK button.
2. While depressing the BACK button, turn the console power ON.
3. Press the associated arrow button for MEMORY FUNC.
4. Press the associated arrow button for DEFAULT.
5. By using the associated arrow button, select the factory defaults to be retrieved and saved to memory:
 - DFLT ALL APR - retrieves all factory default values for APR.
 - DFLT APR REG - retrieves factory defaults for select APR Regions.
6. Upon selecting the factory default(s) to be retrieved, using the associated arrow button, select YES to restore factory defaults, or select NO to maintain current console settings.
7. To exit, turn console power off or press the BACK button to CAL BOOTUP screen and using the associated arrow button, EXIT TO RAD.

Memory Card, Memory Storage

1. With the console power OFF, insert the Memory Card into the slot located on the bottom of the operator console between the angulation handles.
2. While depressing the BACK button, turn the console power ON.
3. Press the associated arrow button for MEMORY FUNC.
4. Using the associated arrow button, select CONS TO CARD.
5. Using the associated arrow button, select YES to copy APR information to the Memory Card or select NO to exit the screen.
6. Turn Off console power and remove memory card.

Memory Card, Memory Retrieval

1. With the console power OFF, insert the Memory Card into the slot located on the bottom of the operator console between the angulation handles.
2. While depressing the BACK button, turn the console power ON.
3. Press the associated arrow button for MEMORY FUNC.
4. Using the associated arrow button, select CARD TO CONS.
5. Using the associated arrow button, select YES to copy Memory Card APR information to the console, or select NO to exit the screen.
6. Turn OFF console power and remove memory card.

Troubleshooting

Below you will find solutions to some of the more common equipment performance problems. In all instances, if the problem is not resolved by following the steps below, you must call your InnoVet dealer for service.

No Exposure

If, after fully depressing the foot switch, there is no audible tone, your unit may not be turned on. Use the circuit breaker to turn on power. If there is still no exposure, call a service representative.

Collimator Light Bulb Burned Out

When the collimator light bulb burns out, you may either call a service person for replacement/realignment or may choose to replace the bulb yourself. The replacement bulb must be FCS type; 150 Watt at 24 V with a pin base.



- Do not look directly into the collimator light.
- Before attempting bulb replacement, be certain that the circuit breaker is turned off to avoid possible electric shock.
- When lit, the collimator bulb is very hot. Wait a few minutes after the light is turned off before touching it so that it cools down.
- Do not make skin-contact with the replacement bulb. Oils from your skin will damage the bulb and may lead to cracking.

1. First remove the back cover of the collimator so that the bulb is visible. Be careful. **The cover may be hot.**
2. Pull the bulb straight out from the ceramic base when it has cooled down.
3. The replacement bulb is normally packaged in a cellophane wrapper. Do not touch the bulb directly with your hands.
4. Tear open one end so that prongs are exposed; hold the glass portion, still in its wrapper, and insert the prongs into the ceramic base.
5. Make sure that each prong is securely fastened into its socket so that the resulting light field is straight. Replace the back cover.
6. If the light field is out of alignment with the grid cabinet, call an authorized service representative for re-alignment.



Always avoid direct contact between bulb and fingers.

No Digital Display

If, after turning on the circuit breaker, digital displays do not light up, the source may be a blown fuse within the unit or a problem with incoming line power. Call an authorized service representative for repair.

Circuit Tripping

If the circuit breaker shuts off on its own, this indicates mA overload. This could be due to mis-calibration of the mA or another malfunction.

Temporarily, you may still be able to operate the unit by lowering the mAs. This will allow you to take x-rays until an authorized service representative is called.

Full kVp Range Inaccessible

If this occurs, it means that incoming line voltage is too low. Call an authorized service representative to correct.

FILM BASED SYSTEMS:

Poor Film Quality

There are many interrelated factors in the radiographic process which impact image quality. The following is a list of items to check whenever you notice a significant change in film quality:

- **Film Processing**

Has chemistry been changed recently? Is a new brand/type being used? Have developing temperatures varied?

- **Technique**

Were proper technique factors used? Consult with your X-ray dealer or look on our website for information on setting up a technique chart.

- **Screens/Cassettes**

Screens within the cassettes degrade with time. They typically lose 10% of their light-emitting capability per year. All screens should be replaced at one time to maintain uniform exposure.

- **Foot switch**

If thorax/chest films are blurring more than usual, it could be that the exposure switch is being used incorrectly.

- **Film**

Have you opened a new package of film? If so, be sure of the following:

- Is it a different brand/type/speed of film than what you've used before?
- Has the film expired?
- Has it been damaged while in storage?
- Does your film color match the cassette color?



Film comes in green or blue. Cassettes do too. You should always be sure that your film color matches your cassette color.



It is recommended that cassettes be re-screened every 5-7 years.

Cleaning

Never use anything other than mild soap and water to clean plastic surfaces. Other cleaners may damage the plastic. Never use any corrosive, solvent, or abrasive detergents or polishes.

Methods of disinfecting used must conform to legal regulations and guidelines regarding disinfecting and explosion protection.



Ensure that no water or other liquid can enter any equipment. This precaution prevents short circuits and corrosion foaming on components.

Some disinfectants contain explosive mixtures of gasses. These gases must evaporate before switching ON the equipment again.

Disinfecting by spraying is not recommended because the disinfectant may enter the x-ray equipment and corrode its components.

If room disinfecting is done with an atomizer, it is recommended that the equipment be switched OFF, allowed to cool down and be covered with a plastic sheet. When the disinfectant mist has subsided, the plastic sheet may be removed and the equipment may be disinfected by wiping.

Maintenance Schedule Recommendations

WEEKLY MAINTENANCE

X-ray Tube Seasoning - It is recommended that you season the x-ray tube once a week to prevent possible pre-mature failure of high voltage (HV) components.

Setup:

- Close the collimator blades.
- Select kVp for each exposure according to tables below.
- Select 20.0 mAs and 200 mA (Lg FS).
- **If 200 mA is not available**, select 10.0 mAs and 100 mA (Lg FS).
- Take x-ray, then wait **30** seconds **between each exposure**.
- Perform exposures 1-8.

Weekly Seasoning Chart			
wait 30s between exposures			
Exp #	kVp	mAs	mA
1	60	20.0	200
2	70		
3	80		
4	90		
5	100		
6	110		
7	120		
8	125		

OR

Weekly Seasoning Chart			
wait 30s between exposures			
Exp #	kVp	mAs	mA
1	60	10.0	100
2	70		
3	80		
4	90		
5	100		
6	110		
7	120		
8	125		

If an error occurs during the seasoning process:

- Cycle generator power.
- Leave **mAs** and **mA** the same.
- Repeat exposure with **previous kVp (lower)**. Keep reducing kVp if error continues.
- Increase kVp back to value when error first occurred and repeat exposure.
- Make note of the date, technique, and error messages for the next x-ray maintenance visit.

If an error occurs every week:

- In general, x-ray tube seasoning should not result in errors.
- If errors begin occurring weekly, then this is a sign of a failing HV component.
- Notify **your local** x-ray service company.
- Shorten the tube seasoning time to every 3-4 days, until the x-ray system has been repaired.

ROUTINE MAINTENANCE

Routine maintenance is to be performed thirty (30) to sixty (60) days after the initial installation, and every six (6) months thereafter. It is the responsibility of the equipment owner to ensure this maintenance is performed as scheduled to meet warranty obligations. The installing dealer, or other factory authorized service organizations will be able to perform this maintenance. The following list is a minimum checklist. Your maintenance procedure may be more extensive than that shown below.

Console:

- Inspect communication cables for wear, binding, and tight coupling.
- Operate all of the switches on the console and verify that they function properly. Some switches (such as AEC controls) may not be enabled.
- Note that all text and numbers on the console screen illuminate properly.

Power Module:

- Inspect internal connections for wear, binding, and tight coupling.
- Measure line voltage and verify that TB1/TB2 are set properly.
- Inspect the HF tuning capacitor (C7), located right below the Relay PCBA, for any form of deformation. A normal capacitor must have a flat top and parallel posts. If the capacitor is suspect, then it should be replaced immediately to prevent damage to other components within the generator.
- Examine the oil level of the high voltage transformer and verify that it is about $\frac{3}{4}$ in from the top of the lid.

System:

- Inspect all system cables for wear, binding, and tight coupling.
- Inspect High Voltage cables for signs of breakdown (carbon tracking), abrasion, or wear. Regrease and retighten into the HV transformer and x-ray tube.

X-Ray:

- Perform tube seasoning/calibration.
- Verify kVp and mAs outputs are within accuracy limits.
- Verify kVp and mA waveforms are of the proper amplitude and shape.
- Annually perform complete system conformance testing per section 7 of install and service manual.

Precautions

Installation

The InnoVet® VERSA must be installed and serviced by an authorized dealer. All warranties will be void if such installation or service is performed by persons not authorized by Summit Industries.

Safety Symbols



This warning symbol indicates a potential hazard to operators, service personnel or to the equipment.

EXPOSE



Radiation exposure symbol on the operator console. Lights to indicate that an exposure is in progress. This is accompanied by an audible tone from the console.



WARNING

THIS X-RAY UNIT MAY BE DANGEROUS TO PATIENT AND OPERATOR UNLESS SAFE EXPOSURE FACTORS AND OPERATING INSTRUCTIONS ARE OBSERVED.

Safe Operation

PROPER USE AND SAFE OPERATING PRACTICES WITH RESPECT TO X-RAY GENERATORS AND EQUIPMENT ARE THE RESPONSIBILITY OF THE USERS OF SUCH EQUIPMENTS.

SUMMIT INDUSTRIES, INC. PROVIDES INFORMATION ON ITS PRODUCTS AND ASSOCIATED HAZARDS, BUT ASSUMES NO RESPONSIBILITIES FOR AFTER-SALE OPERATING AND SAFETY PRACTICES.

SUMMIT INDUSTRIES, INC. ACCEPTS NO RESPONSIBILITY FOR ANY X-RAY EQUIPMENT NOT MAINTAINED OR SERVICED ACCORDING TO THE SERVICE AND INSTALLATION MANUAL OR ANY EQUIPMENT THAT HAS BEEN MODIFIED IN ANY WAY.

SUMMIT INDUSTRIES, INC. ALSO ASSUMES NO RESPONSIBILITY FOR X-RAY RADIATION OVEREXPOSURE OF PATIENTS OR PERSONNEL RESULTING FROM POOR OPERATING TECHNIQUES OR PROCEDURES.

Electrical Safety

Do not connect unauthorized equipment to the rear of the console.



Only properly trained and qualified personnel should be permitted access to any internal parts. Live electrical terminals may be deadly.

Failure to comply with the foregoing may result in serious or potentially fatal bodily injuries to the operator or those in the area.

Mechanical Safety

All of the movable assemblies and parts of x-ray equipment should be operated by properly trained and qualified personnel only.

Radiation Safety

X-ray radiation exposure may be damaging to health, with some effects being cumulative and extending over periods of many months or even years.

X-ray operators should avoid any exposure to the primary beam and take protective measures to safeguard against scatter radiation. Scatter radiation is caused by any object in the path of the primary beam and may be of equal or less intensity than the primary beam that exposes the film.

No practical design can incorporate complete protection for operators or service personnel who do not take adequate safety precautions.

Only authorized and properly trained service and operating personnel should be allowed to work with this X-ray generator and equipment.

The appropriate personnel must be made aware of the inherent dangers associated with the servicing of high voltage equipment and the danger of excessive exposure to X-ray radiation during system operation.

Fundamental Safety Measures:

- **Use of protective wear with an equivalent of a minimum of 0.5 mm of lead is recommended.**
- **Keep as large a distance as possible away from the object being exposed and the X-ray tube assembly.**
- **Never operate this X-ray equipment in areas where there is a risk of explosion. Detergents and disinfectants, including those used on patients, may create explosive mixtures of gases. Please observe the relevant regulations.**
- **Only authorized, trained service staff may remove the covers of the generator and equipment.**