



**Manufacturer of Industrial  
X-Ray Units**

# INTRODUCTION

Lake X-Ray, Inc. is pleased to submit the following proposal for our LKR 2010 Real time X-Ray Evaluation System. Years of experience engineering, building, and repairing medical and industrial x-ray imaging systems form the basis on which this service friendly system was designed. It is with complete confidence that we assure you that this equipment will meet or exceed all the specification, reliability, and safety standards that you require.

The overall dimensions of this system are 50"D x 76"W x 86"H and it weighs 3,800 pounds. The cabinet has been designed with doors to allow easy access to the inside components for repair or replacement, and has a locking storage compartment for accessories, i.e. thermal printer.

The system is composed of the following six major components:

- 1. Constant Potential X-Ray System
- 2. High Energy Image Amplifier
- 3. Solid State Array Video System
- 4. 5-Axis Remote Controlled Parts Manipulator
- 5. Control Panel
- 6. Lead Lined Radiation Protection Cabinet



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**CAUTION**  
  
**X-RAY**  
**KEEP OUT**

LAKE X-RAY, INC. L-172071-1077  
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X-ray image on monitor

Keyboard

# Constant Potential X-Ray System

The LKR 2010 is a 150 -5 constant potential x-ray generator system. This 5-150 kVp system uses a cable feed hi-voltage generator/x-ray tube combination in separate oil-bath housing. The oil-bath housing eliminates the need for water-cooling. Output is self-regulated with digital readout of both mA and kVp. These readout meters are located on the control panel. The x-ray tube is air-cooled and features a closed circuit, automatic shutdown mechanism. If the tube becomes too hot, the machine will automatically shut off.

At the heart of the LKR 2010 is the control panel which features safety controls such as x-ray enable key switch, push button ON/OFF switches, continuously variable kVp and automatic mA control with digital readout, self regulating tube warm up, and a complete safety interlock system for automatic x-ray shutdown. The LKR system operates from a 115 V AC , 60 Hz, 20 Amp circuit, preferably a dedicated circuit.

The LKR system is comprised of:

1. 150 kVp high-tension generator and cable feed x-ray tube
2. Oil-bath tanks to house the hi-voltage generator and x-ray tube
3. 150 kVp at 5 mA maximum output
4. Door safety interlock shutdown system
5. Dual focal spot x-ray tube with 300 micron x 300 micron and 1000 micron x 1000 micron spot sizes
6. Fault Codes to Ease in Troubleshooting





# High Energy Image Amplifier

Included in the LKR 2010 system is a tri- field high-energy cesium iodine image tube (or its equivalent). Also included is a 3-position magnification switch for changing the viewing size. When the switch is in the Normal position, the viewing area is 9 inches. When the switch is in position Mag 1, the viewing area is reduced to 6 inches thereby increasing the magnification. When the switch is in position Mag 2, the viewing area is reduced to 4.5 inches and the magnification is double that of the Normal position. This switch is located on the control panel.

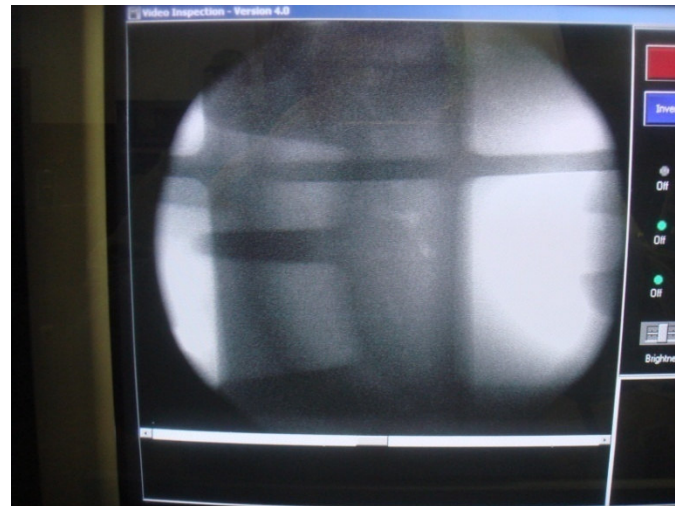
Features include:

- 1. A quick disconnect mount for the solid state camera
- 2. DHHS certified housing
- 3. Solid state power supply
- 4. 65 mm f/.65 objective lens
- 5. 1000 lines per inch in 9" mode



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# Solid State Array Video Camera

The SIM 350 super resolution solid state array video camera is designed specifically for use with image intensifiers and features an "Anti-Bloom" sensor allowing inspections without the problem of lead masking each part.

Features include:

- 1. High gain, high contrast
- 2. More than 570 lines horizontal and more than 485 lines vertical
- 3. Motorized lens coupled to camera, with remote controls for iris and zoom features.
- 4. No image sticking on screen with extremely low lag
- 5. Only.5 lux incident illumination required in high gain mode
- 6. Positive and negative images displayed simultaneously on two 12" Monitors
- 7. Enclosure for camera



# 5-Axis Remote Controlled Parts Manipulator

Lake X-Ray, Inc. will include a 5-axis remote controlled parts manipulating system capable of handling large parts.

Features include:

- 1. Screw Drive floor base style
- 2. 30 inches up/down travel
- 3. 24 inches of left/right travel with a 6 inch diameter parts stage
- 4. 24 inches of in/out travel
- 5. 360\* Rotation ccw or cw
- 6. All speeds variable from a single control located on the control panel
- 7. Two remote joysticks for operating manipulator
- 8. 15 degrees tilt both ways

# Control Panel

The control panel will be mounted in the cabinet next to the lead lined radiation protection chamber. It has been designed to be user friendly, accentuating operator convenience and efficiency.

Mounted on or near the control panel will be the following:

- 1. Two 12" monitors that simultaneously display the high resolution solid state positive and negative camera images
- 2. I50-5 system controls consisting of main power circuit breaker, x-ray enable key switch, kVp vertical brightness control, x-ray on switch and indicator lamp, and x-ray off/reset switch and indicator lamp
- 3. Magnification control switch for changing the viewing size from 9" to 6" or 4.5" magnification
- 4. Manipulator parts tilt switch
- 5. Focal spot size control switch
- 6. 5-axis motor speed control variac
- 7. One joystick for left/right and up/down, and another joystick for in/out and cw/ccw movement of the part on the manipulator
- 8. Camera iris control switch and camera zoom control switch



# Lead Lined Radiation Protection Chamber

The lead lined radiation protection chamber supplied will be totally x-ray shielded and meet all Federal and State radiation regulations.

It also has the following features:

- 1. 10" x 12" leaded glass viewing window located in the door
- 2. 25"W x 39"H door opening allows placement of large parts
- 3. Fluorescent light inside the chamber

# Realtime Image Processing System



- Sealed Fan Cooled Cabinet
- Hard Drive
- Windows based
- CD Writer combo
- Internet capable
- Network card
- Interfaces with x-ray unit with RG 59 Coax cable
- Mouse
- Keyboard
- 19" Monitor
- Photo Quality HP Printer
- Real-time frame averaging 4 to 16 frames
- Still shot saving
- Measuring scale
- Image Enhancing
- Sharp - 3D - Color



# Warranty

One year warranty on labor and Lake X-Ray, Inc parts. Original manufacturer's (OEM) warranty applies on all other components such as X-ray tube, image tube, and options.