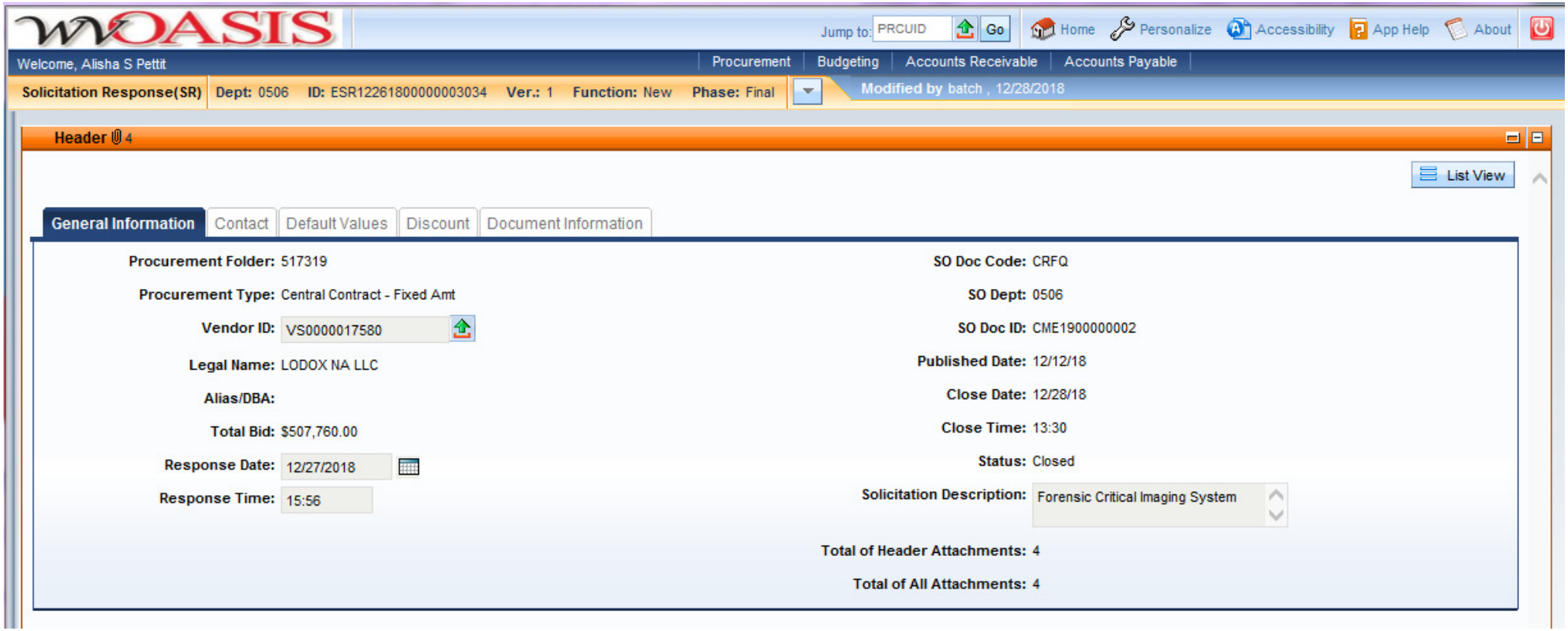
The following documentation is an electronically-submitted vendor response to an advertised solicitation from the *West Virginia Purchasing Bulletin* within the Vendor Self-Service portal at ***wvOASIS.gov***. As part of the State of West Virginia's procurement process, and to maintain the transparency of the bid-opening process, this documentation submitted online is publicly posted by the West Virginia Purchasing Division at ***WVPurchasing.gov*** with any other vendor responses to this solicitation submitted to the Purchasing Division in hard copy format.


WVOASIS
Jump to: PRCUID Go
Home
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Accessibility
App Help
About
Welcome, Alisha S Pettit
Procurement
Budgeting
Accounts Receivable
Accounts Payable
Solicitation Response(SR) Dept: 0506 ID: ESR12261800000003034 Ver.: 1 Function: New Phase: Final
Modified by batch , 12/28/2018
Header 4
List View
General Information
Contact
Default Values
Discount
Document Information
Procurement Folder: 517319
Procurement Type: Central Contract - Fixed Amt
Vendor ID: VS0000017580
Legal Name: LODOX NA LLC
Alias/DBA:
Total Bid: $507,760.00
Response Date: 12/27/2018
Response Time: 15:56
SO Doc Code: CRFQ
SO Dept: 0506
SO Doc ID: CME1900000002
Published Date: 12/12/18
Close Date: 12/28/18
Close Time: 13:30
Status: Closed
Solicitation Description: Forensic Critical Imaging System
Total of Header Attachments: 4
Total of All Attachments: 4

Purchasing Division
2019 Washington Street East
Post Office Box 50130
Charleston, WV 25305-0130

State of West Virginia
Solicitation Response

Proc Folder : 517319

Solicitation Description : Forensic Critical Imaging System

Proc Type : Central Contract - Fixed Amt

Date issued	Solicitation Closes	Solicitation Response	Version
	2018-12-28 13:30:00	SR 0506 ESR12261800000003034	1

VENDOR

VS0000017580

LODOX NA LLC

Solicitation Number: CRFQ 0506 CME1900000002

Total Bid : $507,760.00 **Response Date:** 2018-12-27 **Response Time:** 15:56:24

Comments: It is our pleasure to submit and eXero-DR ful body forensic imaging solution for consideration.
Please reference our attached Proposal and digital brochure files.
Adam Harris, Sales Manager
Lodox NA LLC
440-210-3030
adam.harris@lodox.com

FOR INFORMATION CONTACT THE BUYER

April E Battle

(304) 558-0067
april.e.battle@wv.gov

Signature on File **FEIN #** **DATE**

All offers subject to all terms and conditions contained in this solicitation

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
1	Forensic Critical Imaging System	1.00000	EA	$411,995.000000	$411,995.00

Comm Code	Manufacturer	Specification	Model #
42261900			

Extended Description : Forensic Critical Imaging System

Comments: eXero-DR system ASP (Arm Positioning Scanner), Sedecal X-ray Generator, 3MHU Varian Xray Tube, CSN601 Exero-dr Console with OC computer and Monitor, Radiation safety indicators, 3 Days Applications training INCLUDED. Note- TRL601 eXero-dr Smart Imaging Trolley listed SEPARATELY below

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
2	Smart Trolley/Gurney	1.00000	EA	$33,000.000000	$33,000.00

Comm Code	Manufacturer	Specification	Model #
42261900			

Extended Description : Smart Trolley/Gurney

Comments: (1) One TRL601 eXero-DR Smart Trolley

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
3	System Console	1.00000	EA	$1.000000	$1.00

Comm Code	Manufacturer	Specification	Model #
42261900			

Extended Description : System Console

Comments: Console included with above ASP600 eXero-DR system

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
4	Radiation Leakage	1.00000	EA	$1.000000	$1.00

Comm Code	Manufacturer	Specification	Model #
42261900			

Extended Description : Radiation Leakage

Comments: System Provides "x-ray on" light on console and audible tone when exposing. Lighted Radiation warning signs can be placed on room doors or entryways that activate during the prep-expose phase of the x-ray generator.

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
5	Training	1.00000	EA	$1.000000	$1.00

Comm Code	Manufacturer	Specification	Model #
86132101			

Extended Description : Training

Comments: up to 3 Days applications training included

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
6	One Year Support and Maintenance	1.00000	YR	$1.000000	$1.00

Comm Code	Manufacturer	Specification	Model #
81101706			

Extended Description : One Year Support and Maintenance

Comments: Full one Year system Manufacturer Warranty all parts and labor included.

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
7	Optional Renewal Year 1 - One Year Support and Maintenance	1.00000	YR	$20,920.000000	$20,920.00

Comm Code	Manufacturer	Specification	Model #
81101706			

Extended Description : Optional Renewal Year 1 - One Year Support and Maintenance

Comments: Year 1 of 3 Platinum Elite Lodox Full maintenance plan covering all parts, labor, travel, and preventative maintenance and phone/ VPN support for eXero-DR system and components, including software.

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
8	Optional Renewal Year 2 - One Year Support and Maintenance	1.00000	YR	$20,920.000000	$20,920.00

Comm Code	Manufacturer	Specification	Model #
81101706			

Extended Description : Optional Renewal Year 2 - One Year Support and Maintenance

Comments: Year 2 of 3 Platinum Elite Lodox Full maintenance plan covering all parts, labor, travel, and preventative maintenance and phone/ VPN support for eXero-DR system and components, including software.

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
9	Optional Renewal Year 3 - One Year Support and Maintenance	1.00000	YR	$20,920.000000	$20,920.00

Comm Code	Manufacturer	Specification	Model #
81101706			

Extended Description : Optional Renewal Year 3 - One Year Support and Maintenance

Comments: Year 2 of 3 Platinum Elite Lodox Full maintenance plan covering all parts, labor, travel, and preventative maintenance and phone/ VPN support for eXero-DR system and components, including software.

Line	Comm Ln Desc	Qty	Unit Issue	Unit Price	Ln Total Or Contract Amount
10	Shipping/Delivery/Setup	1.00000	EA	$1.000000	$1.00

Comm Code	Manufacturer	Specification	Model #
78121603			

Extended Description : Shipping/Delivery/Setup

Comments: Full system shipping, delivery, and installation included with system ASP600 eXero-DR system purchase

Full-Body Imaging Solution Proposal

From:
Adam Harris
Sales Manager for North America
Lodox NA LLC
143 Burton Street
Painesville, Ohio 44077
440-210-3030 (PH)
440-210-3030 (FX)
Adam.harris@lodox.com

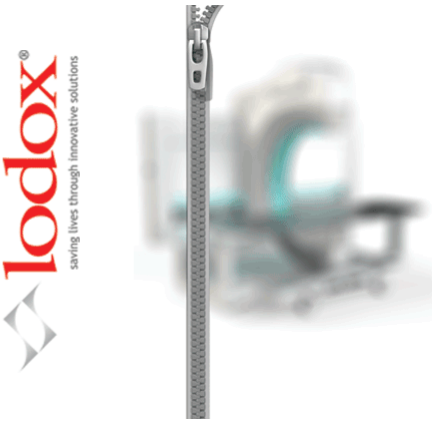
Transmittal Letter

From:
Adam Harris C/O Lodox NA LLC
143 Burton St. Painesville, OH 44077
Phone: (866) 615-6369 Extension 101 or (440)-210-3030
Fax: (440)-210-3030
email: adam.harris@lodox.com

To whom it may concern,

Lodox NA LLC is the only source for the StatScan, Xmplar-DR, and Exero-DR machines and software, their parts, and their direct Technical Support in North America. Please also note that Lodox Systems pty. Ltd. is the only manufacturer of a radiographic system that takes a continuous digital radiograph of large areas, such as, the whole body with low-radiation emission and scatter. We hereby submit the following Proposal for consideration.

Best Regards,



Executive Summary

Introduction

The LODOX eXero-dr is a low dose, high speed, and high-resolution digital X-ray scanning system that can produce an AP full body X-ray image in 13 seconds and also allows for coned down general radiology procedures in AP, Oblique, and Lateral orientations.

System Visual

About the LODOX eXero-dr

The eXero-dr consists of a moving C-arm with an X-ray source mounted at the head of the C-arm and an X-ray detector mounted on the other side of the C-arm (directly adjacent to the X-ray source). This mechanism exposes the subject to a thin fan beam of X-rays. The system also includes a tailor made radiolucent trolley.

The system contains two software applications – one that is used to operate the system (User Interface or UI), and another to view, manipulate and export and/or print DICOM images (Digital Viewing System or DVS).

The DVS can be located remotely, or images can be stored on a PACS.

The LODOX® eXero-dr Critical Imaging System can be used to perform trauma, general or forensic imaging investigations on subjects of any age, gender, weight (limit of 300kg/660 lbs), or physical condition.

The LODOX eXero-dr Advantage

1. Saves Time

An entire full-body AP (Antero-Posterior) image is obtained in 13 seconds, with a complete image available within 30 seconds – giving very high case throughput capacity.

2. User Friendliness

The UI and the DVS are designed for easy and fast access, with pre-set technique factors for all procedures ensuring optimal, diagnostic-quality images that allows the user to operate the machine rapidly.

3. Low Dose

The eXero-dr imaging system is specifically designed to provide the lowest possible dose, providing high resolution, digital radiographic images at a fraction of the dose. The LODOX eXero-dr offers ultra low-dose, full-body screening at both low and high-resolution levels, supplying the user with safe screening and diagnostic value images.

4. Image Quality and Size

• Excellent image quality – Spatial resolution from 1.04 to 5.0 line pairs per mm can be selected, while exceptionally high contrast resolution of up to 16,000 grey levels is available.

• Large images – LODOX eXero-dr generates images of 1800mm in length by 680mm in width in AP position (or 70.86 inches by 26.77 inches) at comparable levels of quality (up to full body size in AP position), which means that the need for multiple radiographs is significantly reduced.

• Electronic information sharing – All radiographs produced by LODOX eXero-dr are available over highspeed networks using industry standard protocols via DICOM.

Our systems for forensics currently reside or are ordered in over 40 federal, state, and local forensic institutions across the US. You may find a list of our active installations here by going to www.lodox.com .

Please also refer to the attached documents on our system included with this proposal as well as the digital media provided.

eXero-dr System Brochures

Ref: eXero-dr Forensics Brochure 2017.pdf

eXero-dr - Digital brochure pack.pdf

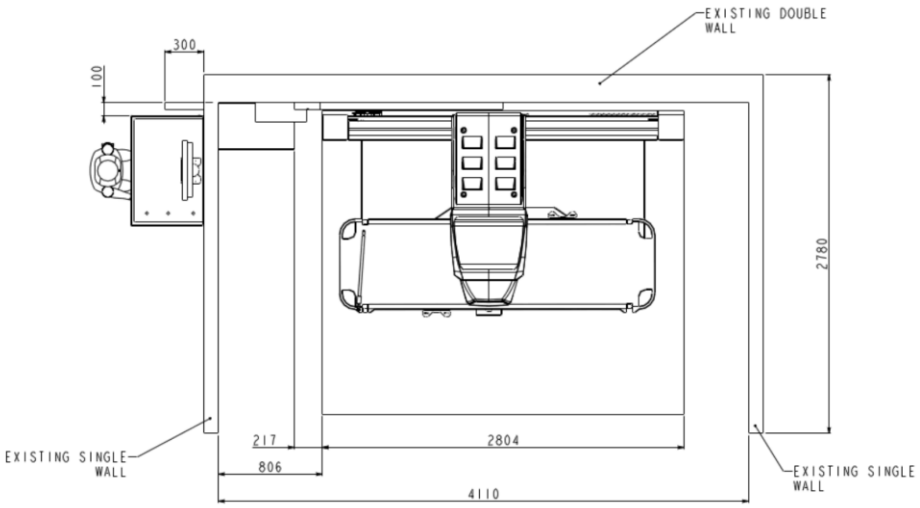
System eXero-dr Technical Specifications

Ref: Lodox Tech Specification with Bleedline.pdf

System Physical loading, measurements, and basic layouts

Ref: FRM-02-0005 LODOX eXero-dr Installation Planning Guide and Site Survey form (1) .pdf

The Lodox system operates within a minimum 10ft x 13.5ft area with minimum 8ft ceiling height (960 square feet) during manipulation of the C-arm into lateral while scanning. This does not include operator area as Operator Console (OC} can be located outside of the room or behind a leaded partition. There are several configuration and layouts depending on room available for location of the unit and its elements.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300
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217
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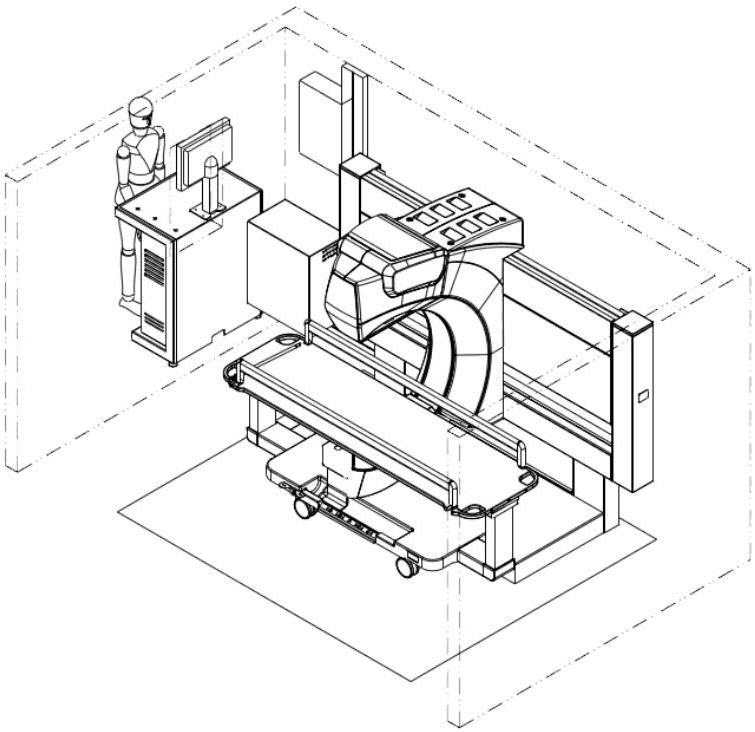
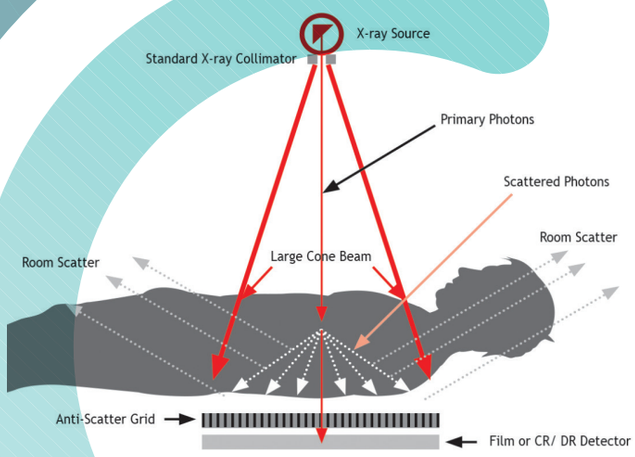
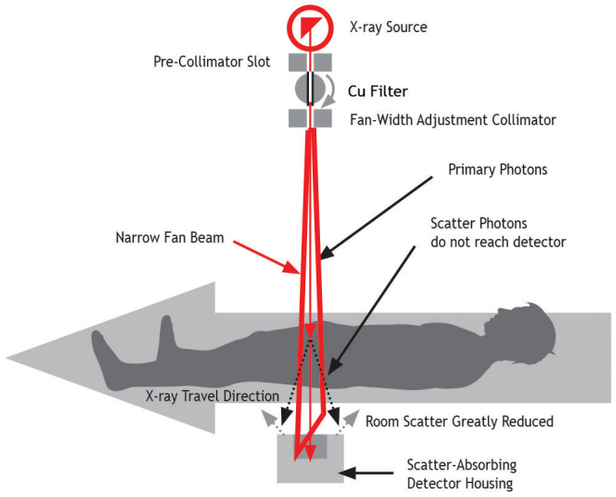
4110
EXISTING SINGLE WALL



lodox®
saving lives through innovative solutions

Lodox X-ray Technology: An Explanation[1]





Conventional, Computed and Digital X-ray Systems

- Conventional, CR and flat panel detector-based DR systems use a wide cone-beam of X-rays which spread over the desired field-of-view in all directions (i.e. length and width).
- This wide beam results in a large number of scattered X-ray photons, which reduce the number of primary X-rays that reach the detector, and degrade the image quality by causing noise on the image.
- Therefore most systems employ a post-patient anti-scatter grid to reduce the number of scattered X-rays which would otherwise reach the detector or film.
- The result is an increase in overall patient radiation exposure in order to counteract the negative effects of scattered radiation from the cone-beam, and the absorption of radiation by the grid.
- This higher radiation exposure and the wide cone of X-rays also causes relatively high amounts of scattered radiation throughout the room.
- The geometric design of conventional, CR and DR systems limits the maximum possible field-of-view to approximately 400mm/16” square.

The Lodox Linear Slot Scanning Radiography System

- Lodox LSSR scanning system is a unique technology employing our proprietary X-ray beam controlling mechanism, and linear scanning technique.
- The Lodox X-ray beam is highly collimated by a narrow slit and a fan-width adjustment collimator into a laser-like fan beam of primary X-ray photons which spreads out in only one direction (i.e. width).
- The narrow beam and high quality primary photons reduce the number of X-rays scattered by the body, so no post-patient anti-scatter grid is required.
- In addition, the detector is fitted into a scatter-absorbing housing, which is designed to eliminate almost all remaining scatter before detection, increasing the signal to noise ratio in the detected image.
- The inherently higher image quality means that a significantly lower patient exposure is required to achieve diagnostic-quality images.
- The lower exposure and collimated, narrow fan-beam also significantly reduce scattered radiation throughout the room.
- The X-ray tube, X-ray fan beam, collimating slit and detector all move together along a linear scanning path, collecting X-ray information to produce X-ray images of 100mm/4” square up to 1800mm/70” x 680mm/27”.

Full-body, high-speed digital radiology with low radiation emission and scatter

1. Potgieter JH, de Villiers M, Scheelka M, de Jager G, “An explanation for the extremely low, but variable radiation dosages measured in a linear slit scanning radiography system”, Medical imaging 2005: The Physics of Medical Imaging, Preceedings of the SPIE, 2005; 5745: 1138 - 45.

eXero-dr Product Specifications

Image Quality	>16000 grey levels; 60µm fundamental pixel size; up to 5 lp/mm
Maximum Image Size	1800mm x 680mm (70” x 26”)
Throughput	35mm/s - 140mm/s; 12.98s for a full scan at normal speed
Duration of Examination	<15 seconds from ‘end of scan’ until image available on screen 28 seconds between successive scans (provided X-ray rube heat <20%)
Positioning	C-arm allows imaging angles from 0° - 90° i.e. AP (or PA) to lateral Table can be tilted from 0 to 340 mm, allowing Trendelenburg angles to 0° - 10°
Output Typical Entrance Dose	Average instantaneous X-ray exposure time of 22ms Chest AP ±0.115 mGy Maximum scattered radiation measured 1 metre from the focal spot in any direction is 0.2 mGy per hour @ 145 kV 250 mA (worst case technique factors)
Detector	Proprietary ultra-low noise TDI CCD detector using Gadox light conversion
Trolley/Gurney	300kgs/660lbs weight capacity Automatic shift to lateral, AP and oblique angles
Machine Dimensions	1500kg/3306lbs; LxWxH: 2 810mm x 1 586mm x 1 227mm (111” x 63” x 89”)
Digital Viewing Station	High Luminance, High Contrast, 23” Monitor; 1920 x 1 080 pixels Imaging software allowing image recall, database access, zoom, pan, rotate, lucid™ image enhancement, anatomical measurement capability and window/level control.
CXR Chair	150kg weight capacity (only eXero-dr), Image area 436 mm x 670 mm
Ambient Environment	10°C - 25°C, 40% - 75% relative humidity, 700hPa - 1060hPa atmospheric pressure, dust free non-corrosive atmosphere
Compliance	US FDA Pre-Market Clearance (510k) No. K013999 Accession # 0310920 EU CE-Mark ISO 13485-2003 ISO 9001:2000 For more information on other accreditations, please visit www.lodox.com

info@lodox.com

7 Dartfield Road, Kramerville, Sandton 2146, South Africa. tel +27 11 444 9118

Lodox NA LLC, 143 Burton Street, Painesville, Ohio 44077. tel (440) 209 1246

www.lodox.com

MKT-19-0027-B

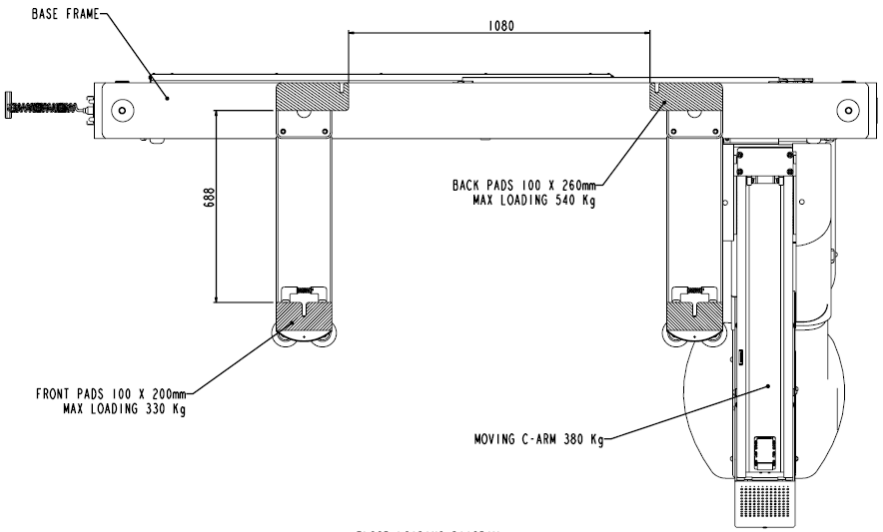
eXero-dr
rapidly evident

12 Appendices

12.1 Appendix A - Lodox® eXero-dr® Floor Loading Detail

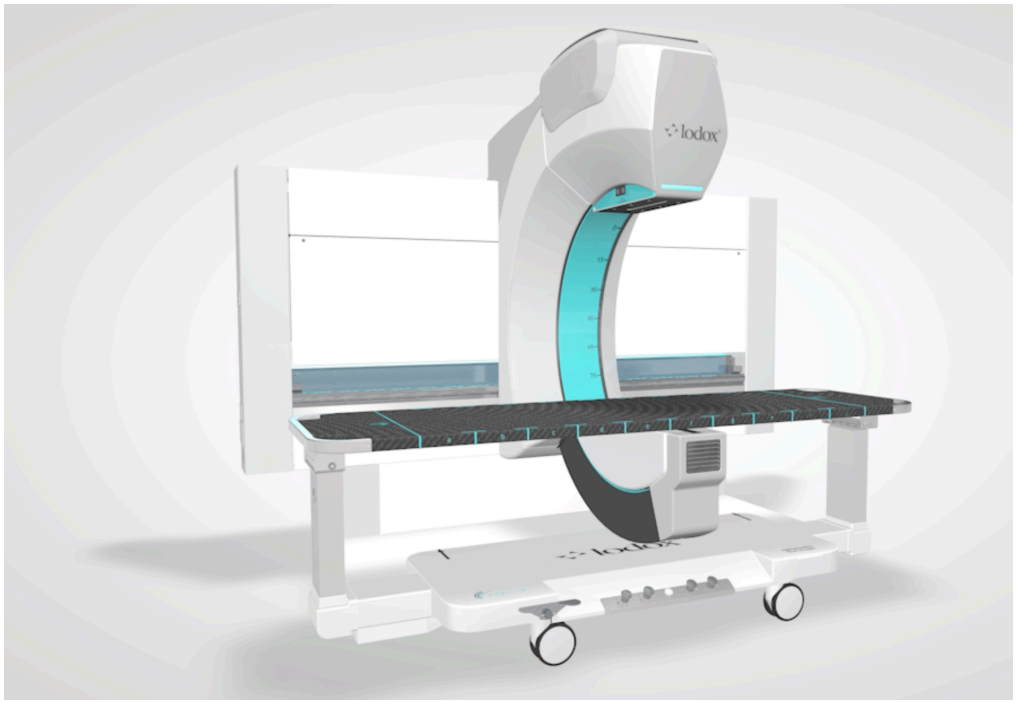
The maximum mass of a Lodox® eXero-dr Scanner is 1150 kg. This is made up of: the Scanner Frame assembly (static portion) being 770 kg and the mass of the Moving Assembly being 380 kg.

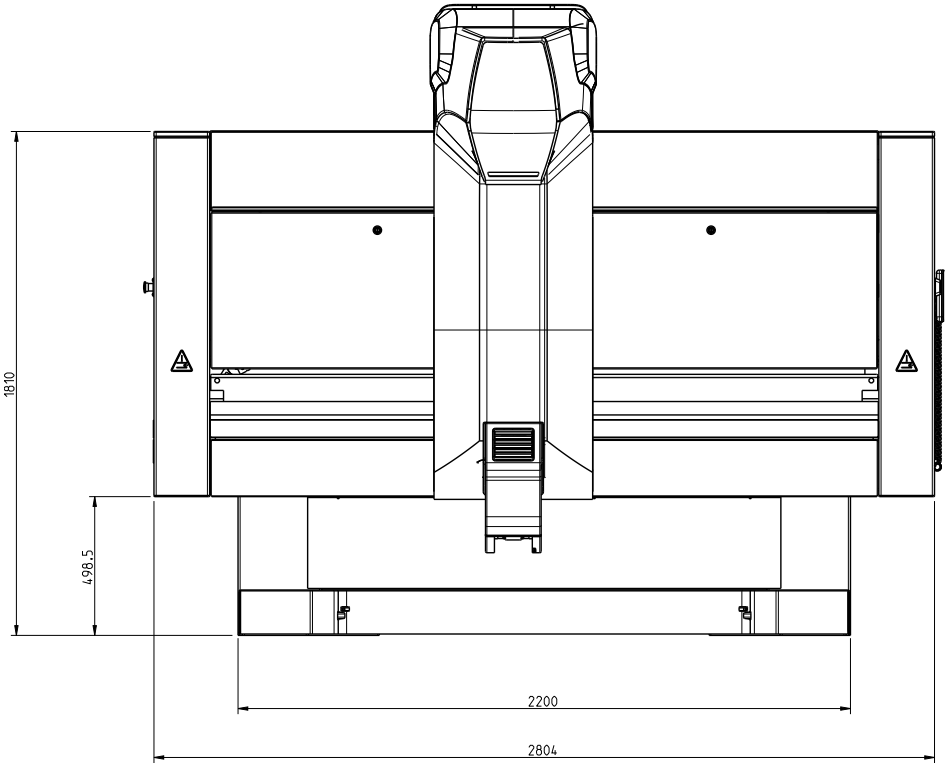
There are four different scenarios that the machine can result in loads on the pads (depending on the relative position of the moving support housing and rotation of the C-arm). The worst case loading on each pad is being shown on the sketch below:



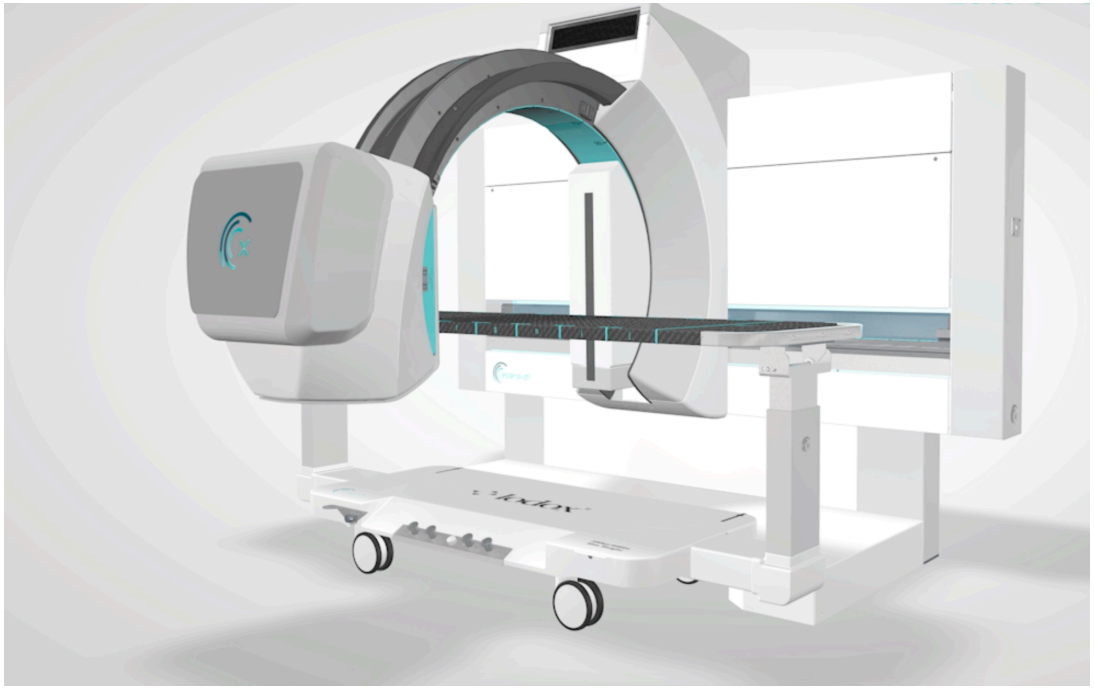
FLOOR LOADING DIAGRAM

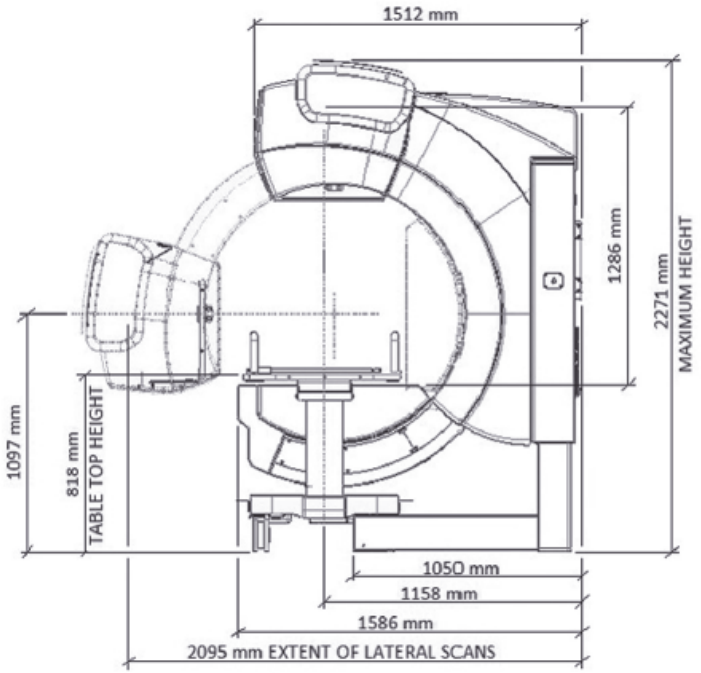
12.2 Physical Dimensions of Lodox eXero-dr



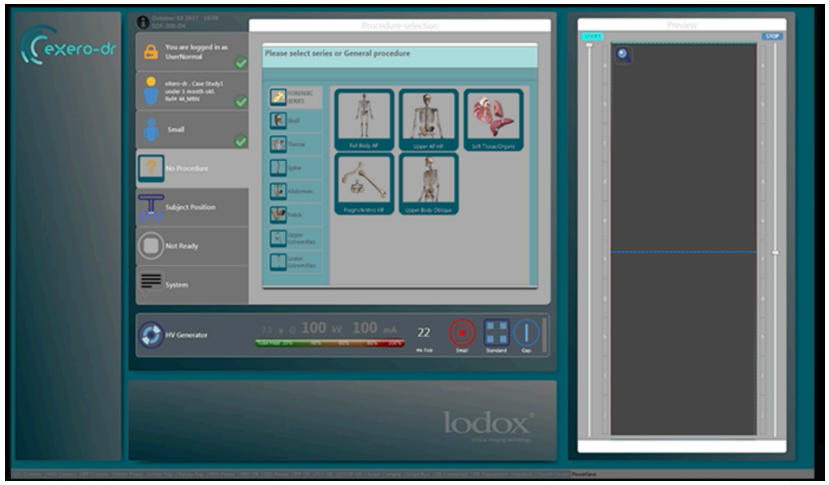


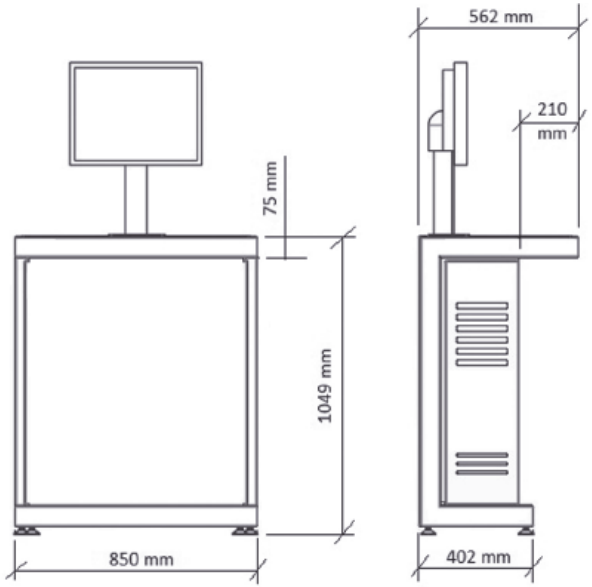
AP Position (0°)





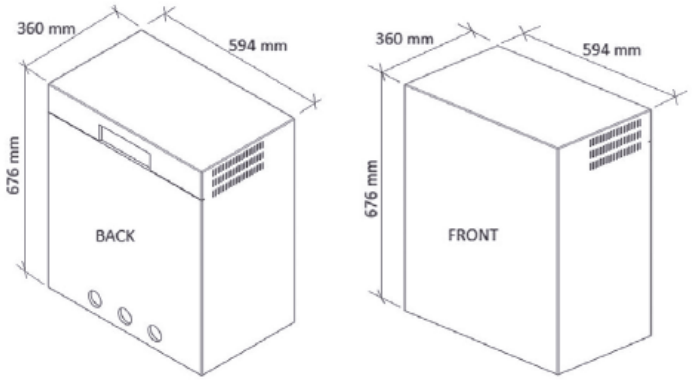
Lateral Position (90°)



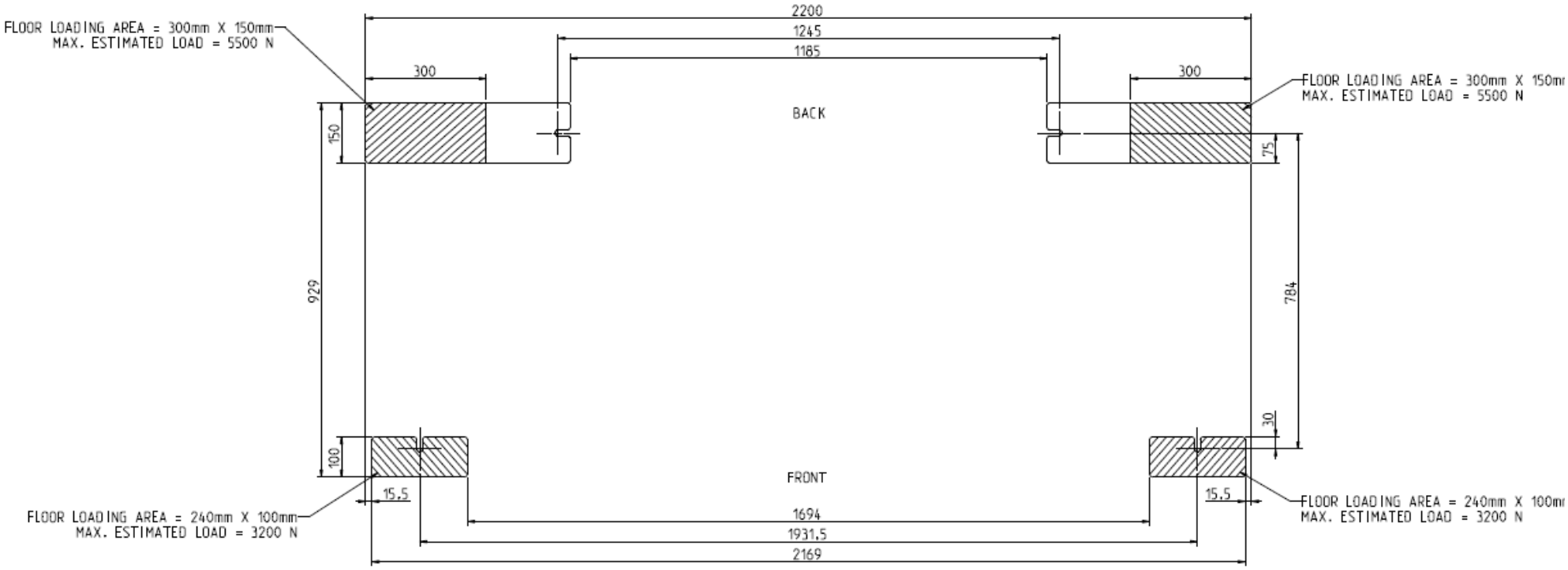


Operating Console and User Interface

exero-dr

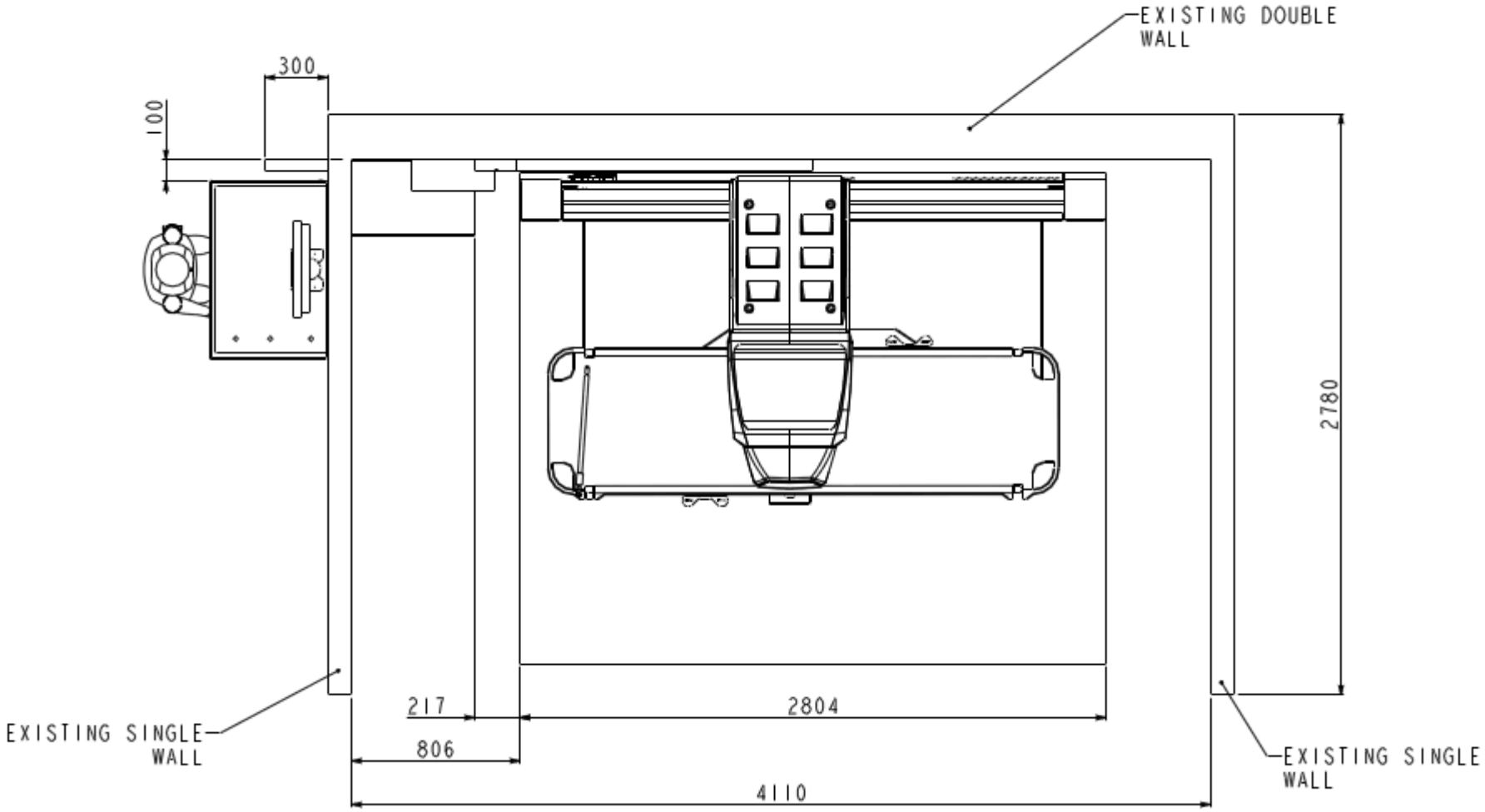


High Voltage Generator



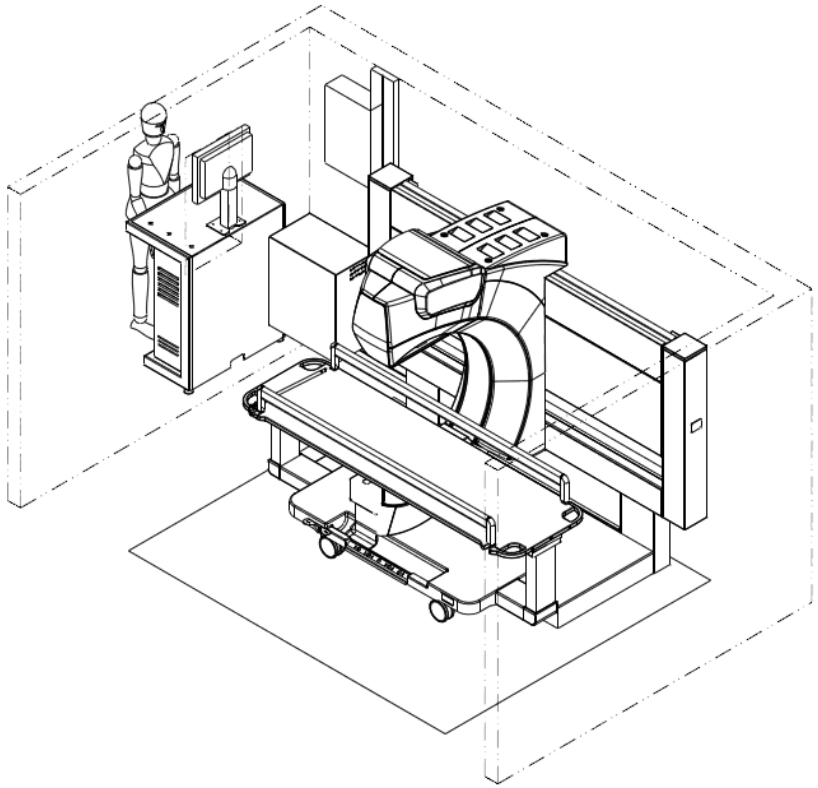
BASE PLATES FLOOR SPACING

12.3 Suggested Room Layouts



MACHINE DIMENSIONS

Weight:	1500 kg / 3306 lbs
Dimensions:	LxWxH: 2 810 mm x 1 586 mm x 2 271 mm / 110.6” x 89.6” x 88.6”
Room height requirement:	2 450 mm / 96.5”
Operation envelope:	LxWxH: 2 834 mm x 2 322 mm x 2 322 mm / 112” x 91.4” x 91.4”
Ideal room area:	LxW 6 000 mm x 3 000 mm / 236.2” x 11 8.1”



NOTES:
1. 380 VAC 3-PHASE POWER FOR THE X-RAY GENERATOR (65A BREAKER MINIMUM) (L1-L2-L3-N-E)
2. 220 VAC - 25A FOR THE XMPLAR-DR MACHINE SUPPLIED AT MACHINE LOCATION. (CLEAN POWER)
3. 220 VAC - 15A FOR THE CONTROL PC AND DVS STATIONS. (CLEAN POWER)
4. NETWORK POINT INSTALLATION NEXT TO OC.
5. AIR-CONDITIONING TEMPERATURE RANGE 10°C - 27°C.
6. RADIATION SHIELDING: OPERATOR LEAD SCREEN TO BE SUPPLIED.
7. ADDITIONAL RADIATION SHIELDING AS PER RADIATION LICENCE REQUIREMENTS.
8. LOCATION OF X-RAY WARNING LIGHTS AND SIGNS TO BE DETERMINED.
9. SITE PREPARATION TO BE IN ACCORDANCE WITH 'FRM-02-0004 INSTALLATION PLANNING GUIDE AND SITE SURVEY FORM'.

MATERIAL SPEC.					THIS DRAWING IS PROTECTED BY COPYRIGH
SURFACE COATING					REMOVE ALL SHARP EDGES AND BURRS TO 0.2 MAX
SURFACE FINISH - MICRONS RMS U.O.S.		3.2	um U.O.S.		
GENERAL TOLERANCE: U.O.S. ±0.2 AND ±1°					DIMENSIONS IN m
PLOOY	PLOOY	TBS	TBS	2013-07-03	WELDING SYMBOLS

Electrical requirements for the installation of a Lodox X-ray Machine

Each Lodox machine installation requires two special power supplies. One is for the stand power and the other is for the X-ray generator power.

1) Stand power – 208/120V single phase with a neutral and 20 amp two pole breaker or fused disconnect switch. The breaker or disconnect should be located at a convenient place within the procedure room.

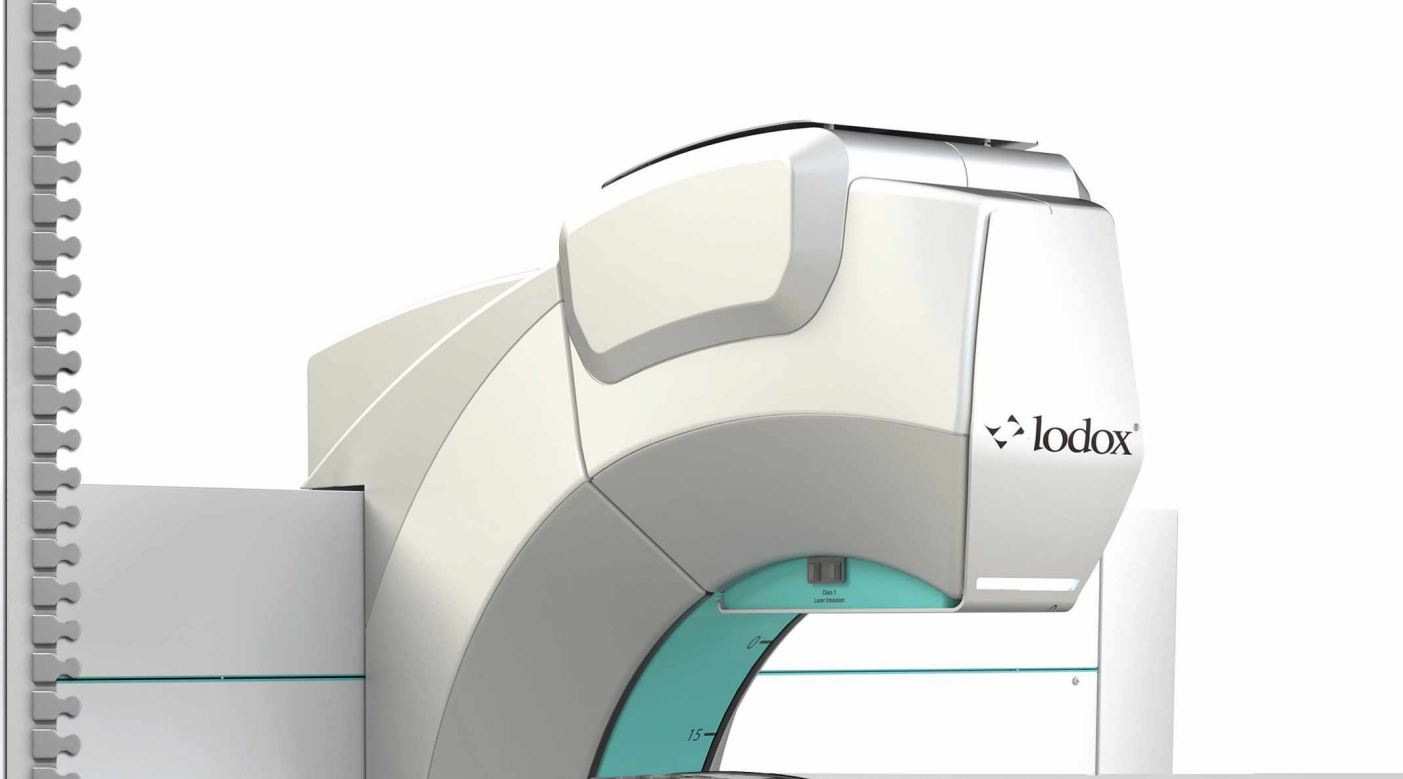
2) X-ray generator power – This shall be a 480 volt three phase source capable of supporting 60KVA. A 80 amp breaker or fused disconnect shall be conveniently located near the x-ray generator cabinet. This supply requires an earth ground sized no smaller than one size smaller than the main conductors and does not require a neutral wire. It can be a Delta or a Wye configuration. The maximum line impedance should be .20 ohms.

   Please follow the wire size chart below for the 480 volt line.

Distance from source	15M	30M	45M	60M
Wire size	AWG 2	AWG 1/0	AWG 2/0	AWG 4/0

3) Please provide convenience 120 volt 15A outlets in the procedure room and control room areas.
4) A network drop will be required near the operator's control console.
5) If an X-ray warning light is provided we prefer to power it from the x-ray generator and not from house power.

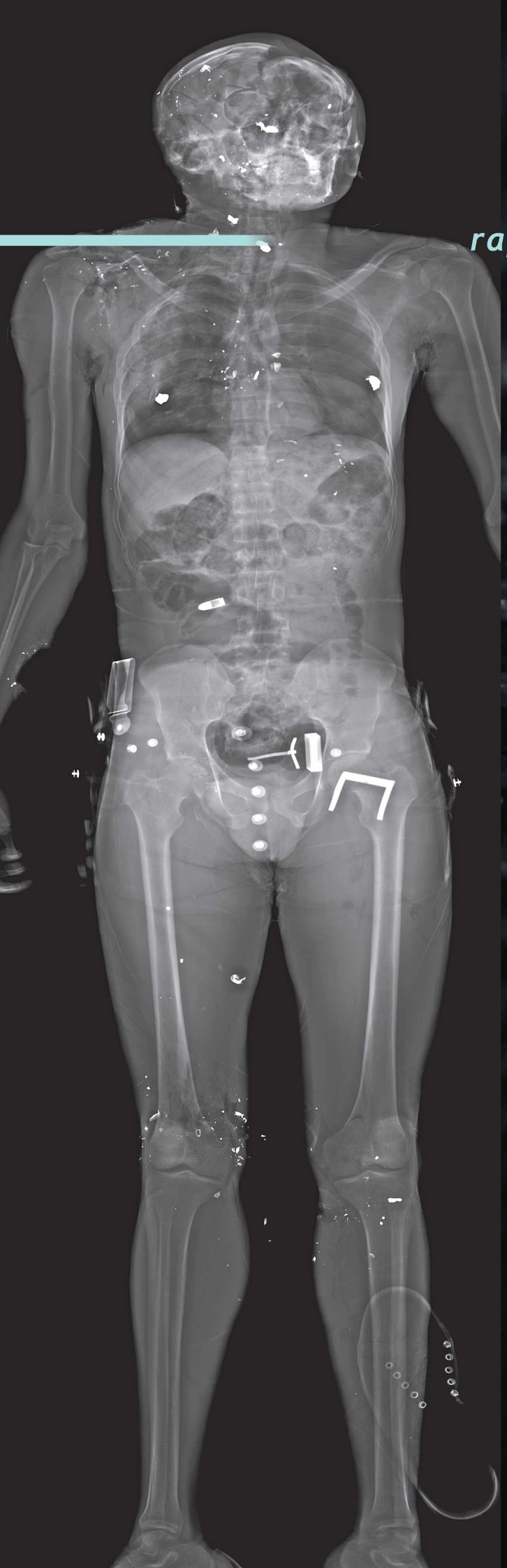
Lodox NA LLC – 143 Burton St. Painesville, OH 44077 – Phone: (866) 615-6369 – email: marty.kulis@lodox.com



UNCOVER FORENSIC RADIOLOGY

lodox®

saving lives through innovative solutions



rapidly evident

exero *| latin*
v. to reveal; uncover
lay bare (body)

The **eXero-dr** assists the forensic pathologist in autopsy examinations by **reducing the time taken to examine a body.**[1]

Rapid localisation of foreign bodies (such as bullets) in multiple views can be beneficial in criminal examinations.[2]

Fast, high quality imaging of all bodies admitted for autopsy may be especially useful in the case of religious groups that require expedited burial[1] and in mass fatality situations.

The full-body, low-radiation format makes Lodox imaging **safer and easier for staff**[1], and could improve the workflow in busy forensic pathology laboratories.[2]

Lodox has proven to be invaluable in Forensic Medicine.[1]

Introducing

exero-dr

rapidly evident

First and only, full-body, high-speed digital radiology solution premeditated for forensic pathology

Forensic Pathologists at Lodox's core

The work of a forensic pathologist resonates deeply at Lodox. Our purpose is to "save lives through innovative solutions". Through our extensive experience and customer focus, we have observed that the art of medico-legal death investigations lies in creative thinking and innovative methods that must be applied in order to seek answers... **answers that will ultimately be used to save lives proactively**.

It was through this common core understanding that Lodox embarked on a collaborative effort that ultimately provided us the opportunity to interpret and exclusively satisfy the needs of forensic pathologists around the world.

Originally conceived for emergency medicine, previous embodiments of the Lodox technology were adopted by forensic pathologists because of certain inherent advantages.

The time has come to uncover a solution that incorporates all of the existing Lodox advantages, but is **specifically moulded to forensic pathology requirements, and complements and integrates more naturally into a forensic facility and the daily needs of pathology staff.**

Forensic Pathology-driven innovation

eXero-dr is the product of over **5 years of dedicated forensic partnerships** in medico-legal death investigation facilities. The user-driven innovations focus specifically on **solving the daily challenges of users and aim to positively affect workflow and user-friendliness**, while maintaining the tried-and-tested Lodox reliability.

These innovations include:

- **Forensic-orientated user interface**

- **Forensic-specific X-ray procedures** to accommodate and optimally visualise:
  - upper-body high-resolution AP,
  - soft tissue/organs,
  - small bone fragments/anthropology,
  - infant size selection (0 - 10kgs/0-22lbs)

- **Comprehensive waterproofing and drainage** - to prevent accumulation of fluids and particles

- **A forensic-driven design** to inspire and provide a positive, elegant point of referral within the daily routine of all forensic staff. It also facilitates cleaning and disinfection

- **Automated gurney system** to allow better positioning and imaging of bodies

Confidence / Peace of mind

The eXero-dr full-body images present a **comprehensive clinical picture, reducing guesswork, offering peace of mind, and better guiding cause-of-death determination.**

The full-body image replaces a number of smaller views, making it **easier to locate and identify injuries, foreign bodies and identifying features.**

A pathologist's clinical judgement and forensic acumen is supplemented, making the eXero-dr system an invaluable resource.

Improved workflow and throughput

Throughput in a facility is increased by the full-body image by reducing the time required for full body examination.[1,2] Use of the Lodox **reduces the total time required for full body coverage by approximately 87%** (translating to 7 Lodox full-body examinations vs. 1 on conventional radiography).[3]

Facility workflow is further improved by the eXero-dr full-body images by **targeting or, in certain cases, obviating the need for an autopsy.**

This makes eXero-dr especially useful in **mass casualty situations.**

User-friendly

Dramatically reduced X-ray scatter makes Lodox technology **safer for operation and surrounding pathology staff.**[4,1]

Straightforward operation makes Lodox easy for staff to use[1], with minimal specialized training or effort required.

Flexible scan size and automated rotation of the scanning arm means **less onerous manipulation of bodies for staff.**

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Projectile from a Head Shot Found in the Abdomen

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saving lives through innovative solutions

A case study from the Tygerberg Forensic Pathology Services Laboratory, Cape Town, South Africa

Introduction

The severity of a bullet wound depends mostly on the characteristics of the projectile, and on the tissue through which the bullet travels. As a bullet enters soft tissue, it creates a permanent cavity - the trajectory of the projectile - by crushing the tissue. In addition, a temporary cavity is produced around the permanent cavity, further stretching the tissue radially. In the brain and liver, particularly, this stretching of tissue can be fatal[1].

Homicide and death as a result of interpersonal violence account for between 36% and 46% of unnatural deaths in South Africa[2,3]. Of these, approximately 29% are firearm-related[3].

Case Presentation

A 76-year old male with a single, close-range gunshot to the right side of the head was found dead on the scene.

Imaging, Diagnosis and Treatment

An external examination revealed a single close-range gunshot entry wound to the right temporal aspect of the head. No exit wound was found on the body. A Lodox full-body scan revealed the retained projectile in the upper left abdominal area corresponding with the position of the stomach.

The autopsy revealed the gunshot track through the right temporal lobe of the brain, continuing to the base of the skull. The projectile then exited the base of the skull and entered the chest via the right side of the neck, perforating the pharynx and trachea, the pericardial sac and heart, the pericardial diaphragm and the stomach. The projectile was retrieved from the lumen of the stomach. The left pleural cavity contained 1600 ml of blood.

Discussion

The external examination revealed a gunshot entry wound in the right temporal skull. Since no exit wound was visible, it was concluded that the projectile would still be within the body[4]. One would expect the most obvious site for the retained projectile would be the skull. However, the Lodox full-body scan revealed the projectile in the stomach. It is not uncommon for a projectile to alter course when it loses its flight stability when it enters a more dense medium (soft tissue compared to air), especially when it also strikes a hard surface such as bone[1], although in this case the angle of entry of the projectile may have accounted for the course the projectile took.

Knowing where the projectile was allowed it to be retrieved more easily for further ballistic analysis. Since the projectile had travelled from the head to the stomach, a more focussed examination of the tissue and organs along the track of the projectile was undertaken to determine the extent of the injuries.

The mechanism of death was determined to be a combination of the trauma to the brain and heart caused by the bullet, the subsequent exsanguination from the affected organs and vessels, and possibly also the haemothorax caused by the accumulation of blood in the pleural cavity.

Conclusion

Knowing where the retained projectile is can alter the course of the autopsy, especially in terms of the approach to retrieving the projectile for further forensic ballistic analysis, but also in terms of determining the track of the projectile and the damage caused to the tissue.

Without a radiograph, an excessive amount of time might have been spent looking for the retained projectile in the brain, thereby extending the total time taken for the autopsy. In a very busy mortuary such as Tygerberg FPS, the pathologists' workload is already very high. Any additional wasted time impacts negatively on the overall workload in the facility. Thus, quick access to relevant information - in this case a full-body radiograph indicating the location of the bullet - is vital for managing the case load efficiently.

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13 Second Full-body Imaging reveals Retained Foreign Object which Contributed to Death of Child

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Image A

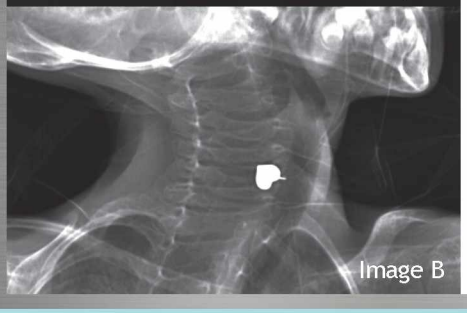
Image B

A case study from a United States Forensic Pathology Facility

Introduction
Cerebral palsy (CP) is an irreversible and non-progressive disorder caused by a brain injury or abnormal brain development, occurring either before birth, during birth or immediately thereafter[1,2]. Cerebral palsy causes physical impairment which may be mild to severe, such as muscle weakness, spasticity, inability to feed independently or to walk. Concomitant medical conditions, and factors such as inability to feed independently or to raise the head strongly predict a reduced life expectancy[3].

Case Presentation
The decedent was a 7-year-old female who was on hospice care. Her complicated medical history included cerebral palsy, polymicrogyria, epilepsy and inflammatory bowel disease. Since birth, she had been unable to walk or talk. She took in formula via a feeding tube. Towards the end of her life the decedent had become intolerant to food, then to water, and died soon afterwards. There was no history of abuse or neglect.

Imaging, Diagnosis and Treatment
Given the extensive medical history of the decedent, the cause and manner of death could normally be determined without an autopsy. However, due to the convenience and quick "Full-Body" acquisition of the Lodox system, a radiographic study was ordered. On the Lodox X-ray image, a foreign object was immediately identified in the neck area (Image A). A lateral view X-ray (Image B) helped to localize and identify the foreign object with greater accuracy. There was no jewelry or clothing accessory on the outside of the decedent or in the body bag. Given this unusual finding, it was decided that an autopsy was necessary to rule out an asphyxial cause of death. The autopsy revealed a heart-shaped earring located a few centimeters below the epiglottis inside the decedent's esophagus. The earring was surrounded by a necrotic cystic abscess.

The cause of death was determined to be as a result of broncho-pneumonia due to the sequelae of the cerebral palsy. The esophageal abscess may have contributed to the patient becoming intolerant to additional oral intake of food or fluids.

Discussion
It is unknown how the earring became lodged in the decedent's esophagus. Foreign body ingestion by children is common, although the actual worldwide incidence is unknown. The Susy Safe Project reports that the incidence in the European Union for children aged between 0 and 14 years is about 50000[4]. Litovitz and Schmitz (1992) reported that 2382 cases of ingested cylindrical and button batteries had been recorded in a national registry over a 7-year period[5]. Other authors report on only the number of cases reviewed in a particular hospital, but note that many more cases are missed because they are not treated in hospital because they have a benign outcome[6,7,8]. The peak incidence occurs in children at ages between six months and three years[9].

Children with CP are much more likely to develop respiratory diseases than children in the general population. A study by Hutton (2008) revealed that 59% of recorded deaths were as a result of respiratory complications, mainly pneumonia, with epilepsy and congenital malformations making up 9% and 8% of the balance, respectively[2].

The finding that the cause of death was due to pneumonia is consistent with the medical history of the patient and is a well-documented cause of death in patients with CP. Asphyxia was ruled out by the autopsy. The source of the earring in the esophagus remains unknown. However, no foul play was suspected.

Conclusion
In <5 minutes, A/P and lateral X-ray images of the decedent were obtained resulting in the identification of an unknown retained foreign object. This highly contributed to the order of a full autopsy examination. In cases where normally only an external examination is performed, the efficiency of the Lodox X-ray scanner allows this forensic pathology facility to take X-ray images of all cases to rule out any occult trauma, old projectiles and retained foreign objects (as in this case). The X-ray finding affected how this case was triaged, and ultimately revealed the cause and manner of death.

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Lodox X-ray Technology: An Explanation

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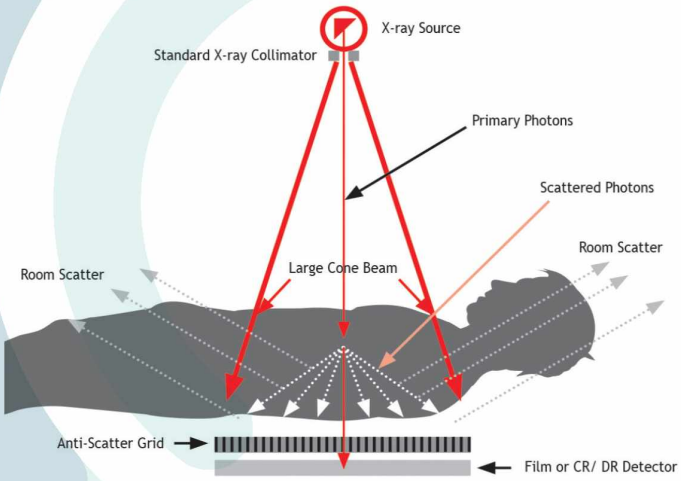

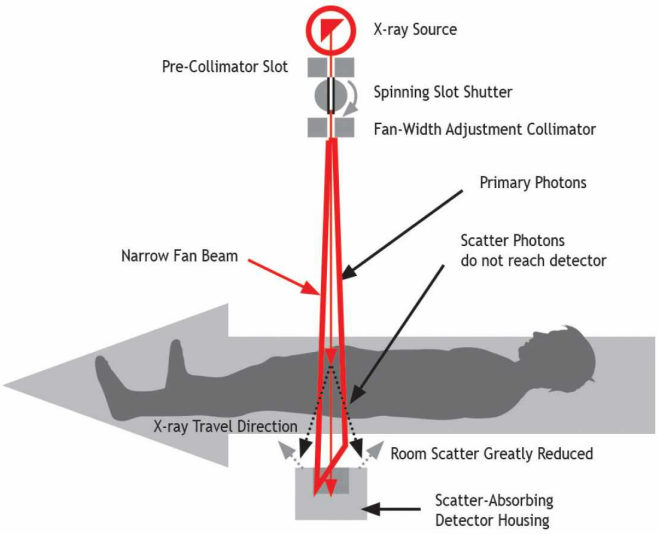

Conventional, Computed and Digital X-ray Systems

- Conventional, CR and flat panel detector-based DR systems use a wide cone-beam of X-rays which spread over the desired field-of-view in all directions (i.e. length and width).
- This wide beam results in a large number of scattered X-ray photons, which reduce the number of primary X-rays that reach the detector, and degrade the image quality by causing noise on the image.
- Therefore most systems employ a post-patient anti-scatter grid to reduce the number of scattered X-rays which would otherwise reach the detector or film.
- The result is an increase in overall patient radiation exposure in order to counteract the negative effects of scattered radiation from the cone-beam, and the absorption of radiation by the grid.
- This higher radiation exposure and the wide cone of X-rays also causes relatively high amounts of scattered radiation throughout the room.
- The geometric design of conventional, CR and DR systems limits the maximum possible field-of-view to approximately 400mm/16” square.

The Lodox Linear Slot Scanning Radiography System

- Lodox LSSR scanning system is a unique technology employing our proprietary X-ray beam controlling mechanism, and linear scanning technique.
- The Lodox X-ray beam is highly collimated by a narrow slit and a fan-width adjustment collimator into a laser-like fan beam of primary X-ray photons which spreads out in only one direction (i.e. width).
- The narrow beam and high quality primary photons reduce the number of X-rays scattered by the body, so no post-patient anti-scatter grid is required.
- In addition, the detector is fitted into a scatter-absorbing housing, which is designed to eliminate almost all remaining scatter before detection, increasing the signal to noise ratio in the detected image.
- The inherently higher image quality means that a significantly lower patient exposure is required to achieve diagnostic-quality images.
- The lower exposure and collimated, narrow fan-beam also significantly reduce scattered radiation throughout the room.
- The X-ray tube, X-ray fan beam, collimating slit and detector all move together along a linear scanning path, collecting X-ray information to produce X-ray images of 100mm/4” square up to 1800mm/70” x 680mm/27”.

The first and only full-body, high-speed digital radiology solution premeditated for forensic pathology.

REFERENCE: 1. Potgieter JH, de Villiers M, Scheelka M, de Jager G, “An explanation for the extremely low, but variable radiation dosages measured in a linear slit scanning radiography system”, Medical imaging 2005: The Physics of Medical Imaging, Preceedings of the SPIE, 2005; 5745: 1138 - 45.

eXero-dr Product Specifications

Image Quality	>16000 grey levels; 60µm fundamental pixel size; up to 5 lp/mm
Maximum Image Size	1800mm x 680mm (70" x 26")
Throughput	35mm/s - 140mm/s; 12.98s for a full scan at normal speed
Duration of Examination	<15 seconds from 'end of scan' until image available on screen 28 seconds between successive scans (provided X-ray rube heat <20%)
Positioning	C-arm allows imaging angles from 0° - 90° i.e. AP (or PA) to lateral Table can be tilted from 0 to 340 mm, allowing Trendelenburg angles to 0° - 10°
Output	Average instantaneous X-ray exposure time of 22ms
Typical Entrance Dose	Chest AP ±0.115 mGy Maximum scattered radiation measured 1 metre from the focal spot in any direction is 0.2 mGy per hour @ 145 kV 250 mA (worst case technique factors)
Detector	Proprietary ultra-low noise TDI CCD detector using Gadox light conversion
Trolley / Gurney	300kg/660lbs weight capacity Automatic shift to lateral, AP and oblique angles
Machine Dimensions	1500kg/3306lbs; LxWxH: 2 810mm x 1 586mm x 1 227mm (111" x 63" x 89")
Digital Viewing Station	High Luminance, High Contrast, 23" Monitor; 1920 x 1 080 pixels Imaging software allowing image recall, database access, zoom, pan, rotate, lucid™ image enhancement, anatomical measurement capability and window/level control.
Ambient Environment	10°C - 25°C, 40% - 75% relative humidity, 700hPa - 1060hPa atmospheric pressure, dust free non-corrosive atmosphere
Compliance	US FDA Pre-Market Clearance (510k) No. K013999 Accession # 0310920 EU CE-Mark | ISO 13485-2003 | ISO 9001:2000 For more information on other accreditations, please visit www.lodox.com

info@lodox.com

Lodox Systems Head Office | 7 Dartfield Road, Kramerville, Sandton 2146 | tel +27 11 444 9118

Lodox NA LLC | 143 Burton Street, Painesville, Ohio 44077 | 1-866-61-LODOX or 1-866-615-6369 (toll free)

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STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

CONSTRUCTION CONTRACTS: Under W. Va. Code § 5-22-1(i), the contracting public entity shall not award a construction contract to any bidder that is known to be in default on any monetary obligation owed to the state or a political subdivision of the state, including, but not limited to, obligations related to payroll taxes, property taxes, sales and use taxes, fire service fees, or other fines or fees.

ALL CONTRACTS: Under W. Va. Code §5A-3-10a, no contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and: (1) the debt owed is an amount greater than one thousand dollars in the aggregate; or (2) the debtor is in employer default.

EXCEPTION: The prohibition listed above does not apply where a vendor has contested any tax administered pursuant to chapter eleven of the W. Va. Code, workers' compensation premium, permit fee or environmental fee or assessment and the matter has not become final or where the vendor has entered into a payment plan or agreement and the vendor is not in default of any of the provisions of such plan or agreement.

DEFINITIONS:

"Debt" means any assessment, premium, penalty, fine, tax or other amount of money owed to the state or any of its political subdivisions because of a judgment, fine, permit violation, license assessment, defaulted workers' compensation premium, penalty or other assessment presently delinquent or due and required to be paid to the state or any of its political subdivisions, including any interest or additional penalties accrued thereon.

"Employer default" means having an outstanding balance or liability to the old fund or to the uninsured employers' fund or being in policy default, as defined in W. Va. Code § 23-2c-2, failure to maintain mandatory workers' compensation coverage, or failure to fully meet its obligations as a workers' compensation self-insured employer. An employer is not in employer default if it has entered into a repayment agreement with the Insurance Commissioner and remains in compliance with the obligations under the repayment agreement.

"Related party" means a party, whether an individual, corporation, partnership, association, limited liability company or any other form or business association or other entity whatsoever, related to any vendor by blood, marriage, ownership or contract through which the party has a relationship of ownership or other interest with the vendor so that the party will actually or by effect receive or control a portion of the benefit, profit or other consideration from performance of a vendor contract with the party receiving an amount that meets or exceed five percent of the total contract amount.

AFFIRMATION: By signing this form, the vendor's authorized signer affirms and acknowledges under penalty of law for false swearing (*W. Va. Code* §61-5-3) that: (1) for construction contracts, the vendor is not in default on any monetary obligation owed to the state or a political subdivision of the state, and (2) for all other contracts, that neither vendor nor any related party owe a debt as defined above and that neither vendor nor any related party are in employer default as defined above, unless the debt or employer default is permitted under the exception above.

WITNESS THE FOLLOWING SIGNATURE:

Vendor's Name: LODOX NA, LLC

Authorized Signature: [signature] Date: Dec 26, 2018

State of OHIO

County of Lake, to-wit:

Taken, subscribed, and sworn to before me this 26th day of December, 2018

My Commission expires June 13th, 2022

AFFIX SEAL HERE

NOTARY PUBLIC STATE OF OHIO

GERGELY ZORN
Notary Public, State of Ohio
My Comm. Expires June 13, 2022
Recorded in Lake County

NOTARY PUBLIC [signature]

West Virginia Ethics Commission

Disclosure of Interested Parties to Contracts

Pursuant to *W. Va. Code* § 6D-1-2, a state agency may not enter into a contract, or a series of related contracts, that has/have an actual or estimated value of $1 million or more until the business entity submits to the contracting state agency a Disclosure of Interested Parties to the applicable contract. In addition, the business entity awarded a contract is obligated to submit a supplemental Disclosure of Interested Parties reflecting any new or differing interested parties to the contract within 30 days following the completion or termination of the applicable contract.

For purposes of complying with these requirements, the following definitions apply:

"Business entity" means any entity recognized by law through which business is conducted, including a sole proprietorship, partnership or corporation, but does not include publicly traded companies listed on a national or international stock exchange.

"Interested party" or *"Interested parties"* means:

(1) A business entity performing work or service pursuant to, or in furtherance of, the applicable contract, including specifically sub-contractors;
(2) the person(s) who have an ownership interest equal to or greater than 25% in the business entity performing work or service pursuant to, or in furtherance of, the applicable contract. (This subdivision does not apply to a publicly traded company); and
(3) the person or business entity, if any, that served as a compensated broker or intermediary to actively facilitate the applicable contract or negotiated the terms of the applicable contract with the state agency. (This subdivision does not apply to persons or business entities performing legal services related to the negotiation or drafting of the applicable contract.)

"State agency" means a board, commission, office, department or other agency in the executive, judicial or legislative branch of state government, including publicly funded institutions of higher education: Provided, that for purposes of W. Va. Code § 6D-1-2, the West Virginia Investment Management Board shall not be deemed a state agency nor subject to the requirements of that provision.

The contracting business entity must complete this form and submit it to the contracting state agency prior to contract award and to complete another form within 30 days of contract completion or termination.

This form was created by the State of West Virginia Ethics Commission, 210 Brooks Street, Suite 300, Charleston, WV 25301-1804. Telephone: (304)558-0664; fax: (304)558-2169; e-mail: ethics@wv.gov; website: www.ethics.wv.gov.

Revised June 8, 2018

West Virginia Ethics Commission

Disclosure of Interested Parties to Contracts

(Required by *W. Va. Code* § 6D-1-2)

Name of Contracting Business Entity: LODOX NA, LLC **Address:** 143 Burton St. Painesville Ohio 44077

Name of Authorized Agent: Martin Kulis **Address:** 143 Burton Street Painesville OH 44077

Contract Number: Solicitation # CME1900000002 **Contract Description:** Forensic Critical Imaging System

Governmental agency awarding contract: State of West Virginia

☐ **Check here if this is a Supplemental Disclosure**

List the Names of Interested Parties to the contract which are known or reasonably anticipated by the contracting business entity for each category below *(attach additional pages if necessary)*:

1. **Subcontractors or other entities performing work or service under the Contract**
   ☑ Check here if none, otherwise list entity/individual names below.

2. **Any person or entity who owns 25% or more of contracting entity (not applicable to publicly traded entities)**
   ☑ Check here if none, otherwise list entity/individual names below.

3. **Any person or entity that facilitated, or negotiated the terms of, the applicable contract (excluding legal services related to the negotiation or drafting of the applicable contract)**
   ☑ Check here if none, otherwise list entity/individual names below.

Signature: x Martin Kulis Date Signed: Dec 26, 2018

Notary Verification

State of Ohio, County of Lake:

I, Martin Kulis, the authorized agent of the contracting business entity listed above, being duly sworn, acknowledge that the Disclosure herein is being made under oath and under the penalty of perjury.

Taken, sworn to and subscribed before me this 26th day of December, 2018

GERGELY ZORN
Notary Public, State of Ohio
My Comm. Expires June 13, 2022
Recorded in Lake County

Notary Public's Signature

To be completed by State Agency:

Date Received by State Agency: _____

Date submitted to Ethics Commission: _____

Governmental agency submitting Disclosure: _____

Revised June 8, 2018

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Lodox Systems North America, LLC
143 Burton Street
Painesville, Ohio
44077

866-61-LODOX (56369)

TO:

April Battle, #File 22
Dept of Administration/ Purchasing Division
2019 Washington Street East
Charleston, WV 25305
For: Office of the Chief Medical Examiner
P: 304-558-6920
Email: Molly.R.Mullins@wv.gov

System Proposal Solicitaton #
CRFQ 0506 CME1900000002
Quotation No: 20181227AH1
Date: 27-Dec-2018
Sales Consultant: Adam Harris

Lodox Systems North America, LLC is pleased to submit the following Quotation offering to sell the Lodox Systems Products described herein at the prices stated. The Lodox Standard Terms and Conditions apply. This Quotation is valid ONLY through **February 28, 2019**. A signed hardcopy Non-Contingent Purchase Order must be in the possession of Lodox by that time.

S/N	Quantity	Description	Price
		NEW Forensic-specific eXero-dr Critical Imaging System	$ 411,995.00
ASP600	1	Full Body X-ray System For Rapid Assessment Forensic Pathology	
		Included:	
		• All Standard Configuration Components As Described Below	
	1	1 Year full factory warranty (tube pro-rata)	$ 1.00
TRL601	1	Bariatric eXero-DR Smart Trolley	$ 33,000.00
CSN600	1	eXero-dr Console	$ 1.00
	1	Radiation Leakage indicators (X-ray On lights and warning tone)	$ 1.00
	1	3 Days Applications Training	$ 1.00
	1	Shipping, delivery, and setup with calibration and commisioning	$ 1.00
			eXero $445,000.00
	1	(optional) Platinum Elite Level Maintenance Contract (3 year term)	$ 62,760.00
		Total Package with Addtl. 3 Year Extended Maintenance Plan	$ 507,760.00

Authorized Buyer:

Signature

Title

Date

Accepted by:

Signature

Sales Manager, North America

Title

12/27/2018

Date

This Quotation is not binding until it is signed by an officer of LODOX SYSTEMS NORTH AMERICA, LLC / Lodox Systems (PTY) LTD ("LODOX"), or by an officer of a dealer under LODOX contract (AUTHORIZED).

Quotation No: 20181227AH1
Date: 12/27/2018

S/N	Quantity	Description	Price
eXero-DR	1	**Standard Configuration Features:** ► **Flexible-Format Digital Radiography (DR) Image Formation** * Allows a wide variety of high resolution image acquisition, ranging from the size of a "Whole-Body", to the size of a "Hand". * Field of View is Adjustable from 100mm x 100mm to a maximum 680mm x 1800mm for full body. Images can be made of any body part without moving the patient. ► Compliance * FDA Approved: FDA (510k) No. K013999 Acc# 0310920 * ISO Approved: CE Mark, ISO 13485:2003 ISO 9001:2000 ► **High Resolution Digital Imaging Performance** * Contrast Resolution : >16000 grey levels (14 bits) – After log compression * Fundamental pixel size: 60 µm (1x1 binning) * Maximum Size single image:1800 mm * 680 mm (full body size, measured at lowest table height) * Base resolution mode : 1.04 lp/mm at 8x8 pixel binning. 0.48mm pixel size. Max 48000 grey levels. Maximum size = full body (image size 1536 x 8000 pixels) * Standard resolution mode : 1.4 lp/mm at 6x6 pixel binning. 0.36mm pixel size. Max 36000 grey levels. Maximum size = full body (image size 2048 x 8000 pixels) * High resolution mode : 2.1 lp/mm at 4x4 pixel binning. 0.24mm pixel size. Max 24000 grey levels. Maximum size = full body (image size 3070 x 8000 pixels) * Very High resolution mode : 4.2 lp/mm at 2x2 pixel binning. 0.12mm pixel size. Max 12000 grey levels. Maximum size = half of full body size (900mm x 680mm)(image size 6141 x 8000 pixels). * Ultra high resolution mode : 5.0 lp/mm (Measured) - 8.33 lp/mm (Theoretical) at 1x1 pixel binning. Maximum size = 480mm (quarter & half speed only) (image size 12288 x 8000 pixels) Max 6000 grey levels. This mode is designed mainly for extremity imaging applications and less dense body area in general. ► **System Throughput Performance** * Linear scanning rate (3 settings): 35 mm/s, 70mm/s, and 140mm/s ± 5% * Instantaneous frame rate (The time taken for the X-ray beam to transverse any one point, or how long any point is exposed to X-rays): 11 - 80 milliseconds. * Time to complete a full field scan: <13 seconds * Time from "end-of-scan" until a diagnostic image becomes available on the DVS screen: <15 seconds (Normal resolution image on a stand-alone 100Mbits/s Ethernet Base-T network. * Best case time between two successive x-rays on the same patient: 28 seconds (Provided heat capacity of X-ray tube <20%) ► **Patient Imaging & Positioning Flexibility**	*Included* *Included*

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		* 0 to 90 degrees. The supine or prone patient can be X-rayed in any radial angle from AP (or PA) to beyond the Supine (or Prone) lateral positions.to 90 degrees. The supine or prone patient can be X-rayed in any radial angle from AP (or PA) to lateral positions. Integrated smart trolley elevates according to c-arm position ► **Environmental** * Temperature: +10 to + 25o Celsius * Humidity: 40% to 75% Non-Condensing * Atmospheric Pressure: 70kPa - 106kPa	
TRL601	1	► **SmartTrolley / Gurney (Dual-Purpose Imaging Table & Trauma Stretcher)** * The trolley /gurney top height can be adjusted vertically by 0 to 340mm via a foot operated switches, either end can be individually adjusting to allow Trendelenburg angles up to +/- 10 degrees. Radiolucent Carbon Fiber Patient Safety Rails - Either rail can be left in place during normal 2D x-ray procedures, adjusted to different off-setting heights and/or fully retracted, as need * Trolley automatically raises and lowers to accommate the rotary motion of the C-arm when moving AP-Lateral and back. * Dimensions: 2240 x 740 x 810 (L x W x H) * Patient X-ray Capacity: 300 kgs / 660 lbs.	*$33,000*
CNS600	1	► **System Console (DVS and OC)** **Dual Purpose (Operator console and viewing station)** (Includes MON021 & CMP030) * eXero-dr User Interface: tab-based and simple operation. * Sets all X-ray technical parameters, via Preset Anatomical Programming or Manual Operation * Controls Linear and Rotary C-Arm Motion via on-screen control and easy-to-use joystick controller * Initiates and terminates X-ray exposures via easy-to-use joystick controller * Flexible Floor Mounted Cabinet Design can also house HV X-ray Generator	*Included*
MON021	1	**Monitor** * A NEC P232W monitor or equivalent will be supplied * 23" (203" viewable image size) Colour LCD, active matrix, thin film transistor (TFT), liquid crystal display. * Resolution: 1920 x 1080 * 250 cd/m2 white luminance typical * 1000:1 contrast ratio - typical	*Included*
CMP030	1	Workstation Computer * System Computer: Based on at least a dual core processor such as the Intel Pentium 4/D/Core 2 Duo and enhanced graphics engine. * Operating System: Windows 10 * Disk Drive Capacity: Dual 1TByte (minimum) in "ghost copy" configuration for quick system recovery and back-up	*Included*

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S/N	Quantity	Description	Price
		* User Interface: 2 Button + scroll Mouse Driven Windows Graphic Interface * High Speed Proprietary Image Processor/DVS software * Image Processing Features include: * Zoom/Pan/Rotate; Contrast / Brightness; Edge Enhancement; Histogram Equalization; Palette Function; Invert * Database Server Module * DICOM 3.0 Network Interface * Send / Receive / Print / Worklist Retrieve patient demographics only * DICOM 3.0 Input interface is required on the printer side. * Lodox eXero-dr Local Archive System * Lodox eXero-dr Data Management Software / DVD Recorder Package	
		X-ray System **Radiation Type** The eXero-dr emits ionized X-radiation by a precise narrow fan-beam scanning * across the patient that progressively creates diagnostic quality images at very low dose rates. **Direct Absorbed Dose** Maximum entrance dose for a full-body X-ray is 0.12 mGy (absorbed dose 99µSv). * For typical procedures, approximately 25% (conservative), on average, of equivalent conventional system doses are emitted. **Leakage Radiation** * The maximum leakage radiation measured 1 meter from the X-ray focal spot in any direction is less than 20 uGy per hour @ 145kV 250mA.	*Included*
GEN001	1	**X-Ray Generator** * Peak Power 64 KW * Voltage Range 50kVp – 145 kVp * Voltage Rise Time 2mS (10 to 90%) * Voltage Stability < 4% * Voltage Ripple 0.5% * Current Range 32mA to 400mA * Exposure Time 0.6s to 16s * Operating frequency 40kHz	*Included*
TUB002	1	**X-ray Tube** * 3.5 Million HU, Rotating Anode CT type FDA/CE approved	*Included*
		Detector * Proprietary Solid State Detector Technology (similar to spiral/helical CT scanner detector technology) **X-ray to light conversion** * Rarex Green Fast (“Gadox” = GdOS2:Tb)	*Included*
BOL001	1	► **Radiographic Aids** * Bolus Material – Comfort shaped for Lateral C-Spine Imaging	

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S/N	Quantity	Description	Price
	1	**System: Year One (1) - Twelve (12) Months Parts (tube pro-rata) and Labour.** (See Lodox Terms & conditions below for further details)	*Included*
	1	**Standard Installation:** System installation and commissioning Included. All site renovations are the responsibility of the Buyer. The provision of suitable site services including air-conditioning and electrical power are the responsibility of the buyer Clinical Engineering Training is included	*Included*
	1	**Standard Clinical Applications Training is included:** Three (3) days Included. **Estimated Delivery** 180 days from date of order	*Included*
		Optional Extras (not included, unless otherwise indicated in main body):	
SVS005	1	► **Diagnostic Viewing Station (DVS) - Unlimited multi-node DVS's Supported . (Includes: MON021, CMP030 & SOA001**	**$ 14,900.00**
MON021	1	**Monitor** * A NEC P232W monitor or equivalent will be supplied * 23" (203" viewable image size) Colour LCD, active matrix, thin film transistor (TFT), * Resolution: 1920 x 1080 * 250 cd/m2 white luminance typical * 1000:1 contrast ratio – typical	
CMP030	1	**System Computer: Based on at least a dual core processor such as the Intel Pentium 4/D/Core 2 Duo and enhanced graphics engine.** * Operating System: Windows 10 * Disk Drive Capacity: Dual 1TByte (minimum) in "ghost copy" configuration for quick system recovery and back-up * User Interface: 2 Button + scroll Mouse Driven Windows Graphic Interface * High Speed Proprietary Image Processor/DVS software * Image Processing Features include: * Zoom/Pan/Rotate; Contrast / Brightness; Edge Enhancement; Histogram Equalization; Palette Function; Invert * Database Server Module * DICOM 3.0 Network Interface * Send / Receive / Print / Worklist Retrieve patient demographics only * DICOM 3.0 Input interface is required on the printer side. * Lodox eXero-dr Local Archive System * Lodox eXero-dr Data Management Software / DVD Recorder Package	*Included*

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S/N	Quantity	Description	Price
SOA001		**Lodox eXero-dr Local Archive System (Recommended for each DVS)** * Data Management Software / DVD Recorder Package	*Included*
SVS006		► **Identical to SVS005, above, but with an upgraded medical quality viewing monitor:** (Includes: MON020, CMP030 & SOA001)	*Included*
MON020		**DICOM compliant, Diagnostic Quality 20" monitor, at least 3MP flat panel LCD (BARCO Nio 3MP (E-3620 MA)** * Resolution: 2048 x 1536 pixels, 0.2070mm pixel pitch * Contrast 400:1 (typical) * Maximum Luminance (800 Cd/m² calibrated), Uniform Luminance Technology * 382mm x488mm x 114 mm (W x H x D) * NOTE FOR SA CUSTOMERS: This monitor meets the SANAS requirements for a Diagnostic Medical Viewing Monitor. However, it will be the client's responsibility to ensure that the ambient lighting is also in accordance with these standards to ensure conditions suitable for medical diagnostic viewing.	
TRL601		► **Bariatric SmartTrolley / Gurney (Dual-Purpose Imaging Table & Trauma Stretcher)** * The trolley /gurney top height can be adjusted vertically by 0 to 340mm via a foot operated switches, either end can be individually adjusting to allow Trendelenburg angles up to +/- 10 degrees. * Radiolucent Carbon Fiber Patient Safety Rails – Either rail can be left in place during normal 2D x-ray procedures, adjusted to different off-setting heights and/or fully retracted, as need * Trolley automatically raises and lowers to accommate the rotary motion of the C-arm when moving AP-Lateral and back. * Trolley automatically weighs patients to allow for accurate technique factor (kV, mA) selection. * Dimensions: 2240mm x 740mm x 825mm (L x W x H) * Patient Weight Capacity: 300 kgs / 660 lbs.	**$ 33,000.00**

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Lodox Systems (Pty) Ltd. / Lodox NA, LLC
TERMS AND CONDITIONS OF SALE

Buyer's order is accepted upon and subject to Buyer's assent to the terms stated below, which Buyer agrees are a complete, final and fully integrated statement of the agreement (the "Agreement") between Buyer and LODOX SYSTEMS (PTY) LTD. or LODOX NA, LLC ("Seller"). They may not be varied in any way at any time, except by a further written agreement approved and executed by a specifically authorized representative of Seller.

1) PRICES AND PAYMENT: All sales are f.o.b. Seller's plant, unless otherwise specified in the quotation, and payments are due and payable (without offset or deduction) as follows: (a) Sales of Product(s) to End Users: 20% upon execution of this Agreement, 70% upon delivery of the system and the final 10% net 30 after upon the completion of the installation; This is true unless terms are otherwise specified in the quotation. Sales of Product(s) to ANY party outside the United States or its Territories are: Irrevocable Letter of Credit due upon receipt of order. All orders are subject to approval of Seller's credit department at time of shipment.

If shipments are delayed due to the actions of Buyer or due to other conditions beyond Seller's control, payment or pro rata payment, as the case may be, are due and payable on invoices issued on or after the date Seller is prepared to make shipment. If performance of work hereunder is delayed by Buyer, pro rata payments are due and payable on invoices issued when or at any time after the delay begins. Product(s) held for Buyer shall be at Buyer's risk and expense. Notwithstanding anything to the contrary herein, Seller may require full or partial payment in advance, if in the judgment of Seller, the financial condition of Buyer at any time prior to shipment so warrants. In the event of failure of Buyer to make payments for any installment of goods when due or Buyer's breach of any other provision of this Agreement, Seller may withhold further delivery until the default has been remedied or may require that subsequent deliveries be paid for in cash upon delivery. On overdue accounts, interest shall be charged and payable on the amount of the unpaid balance at the lower of: (i) one and one-half percent (1 1/2%) per month, or (ii) the highest rate of interest then permitted by law.

To secure payment of all amounts due Seller hereunder, Buyer hereby grants Seller a security interest in any and all Products, Parts, accessories and equipment (and in all proceeds and products of the foregoing) which may be sold, licensed and/or furnished by Seller to Buyer hereunder.

2) *RISK:* Except as otherwise agreed to in writing, all risk of loss or damage to the Product(s) or any Part thereof, shall pass to Buyer and shall become Buyer's sole responsibility upon Seller's completion of delivery to the Buyer's facility.

3) TITLE: Except as otherwise agreed to in writing, title to the Product(s) or any Part thereof, shall pass to Buyer upon the Seller receipt of Buyer's final payment equaling 100% of the mutually agreed upon payment amount due to Seller. The Product(s) or Spare Part(s) shall be and remain personal or movable property, not withstanding their mode of attachment to realty or other property.

4) TAXES, DUTIES AND PERMITS: Seller's prices do not include any sales, use, excise, or similar taxes nor any export, import or other duties. The amount of any such taxes or charges applicable to the sale, use, exportation or importation of the Products to be sold hereunder shall be paid separately by Buyer, or Buyer shall provide Seller a proper exemption certificate in respect thereof. All export and import permits required shall be furnished by Buyer.

5) SHIPMENTS: Shipping dates herein are approximate and are based upon estimated factory work schedules currently in effect. They are subject to timely receipt of all necessary materials and supplies from Seller's vendors, all necessary information and data from Buyer, priority and scheduling requirements, and other contingencies beyond Seller's control. The time within which shipment shall be made hereunder shall include such additional time from the date herein specified as may be required by reason of non-availability or shortage of materials, supplies, labor, fuel, power or data, or by strike, flood, riot, fire, government regulation, explosion, terrorism, war or other casualty or cause beyond the reasonable control of Seller. Seller will use its best efforts within a reasonably practicable period of time after the occurrence of such condition to notify Buyer of the nature of the occurrence and the estimated length of additional time necessary to full this order.

Seller shall not in any event be liable for any loss, damages or expenses, including, without limitation, consequential, special, or incidental damages, loss of profits or revenues or otherwise, incurred of suffered by buyer or buyer's customers as a result of any delay in shipment or delivery. Buyer specifically and explicitly agrees that it has no rights hereunder to claim force majeure as an exculpating reason for any default on its part.

6) *PACKING:* Unless a preferred packing method is provided for elsewhere in the order, all articles shall be packaged and packed for shipment and storage in accordance with good commercial practices. Preferred packing charges shall be paid by Buyer.

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TERMS AND CONDITIONS OF SALE

7) ACCEPTANCE: Unless Seller agrees in writing to the contrary, Buyer shall inspect each Product or Part promptly upon, and in any event within five (5) days following, delivery. In the event Buyer fails to notify Seller of any defect, deficiency, omission, or nonconforming delivery with respect to Products or Parts delivered to Buyer within ten (10) days following delivery, Buyer shall be deemed to have unconditionally accepted delivery of such Products and Parts. If any Product or Part delivered or required to be delivered by Seller to Buyer shall be defective, omitted, or otherwise nonconforming, Buyer must deliver a written notice to Seller within ten (10) days following such nonconforming delivery by Seller, specifying in such notice the particular defect, deficiency, omission, or nonconformity upon which Buyer is relying to justify rejection of delivery. Buyer hereby agrees that such ten (10) day period is a reasonable period of time after delivery within which to reject products. Within ten (10) business days following Seller's receipt of Buyer's written notice of rejection with respect to Products or Parts sold or licensed hereunder, Seller may notify Buyer

in writing of Seller's intention to cure any such defective or nonconforming goods, and Seller shall have a reasonable period of time thereafter within which to make a conforming delivery or to otherwise correct or remedy the specific condition upon which Buyer is then relying in rejecting the Products or Parts. Any rejection properly made by Buyer shall apply only to nonconforming goods, and Buyer is required to complete its purchase of all other Products and Parts pursuant to any and all Purchase Orders between Buyer and Seller, strictly in accordance with the terms and conditions thereof.

8) LIMITED WARRANTIES; LIMITATION OF LIABILITY: All Product(s) manufactured by LODOX SYSTEMS (PTY) LTD. or LODOX NA, LLC (Seller) are warranted against substantial defects in materials and workmanship for twelve (12) months from date of first clinical use. For all Product configurations, warranty is contingent upon the availability of a suitable VPN system located at the customer site. All glassware (x-ray tubes) are warranted for twelve (12) months on pro-rated OEM factory warranty basis from date of first clinical use. Consumables, such as CD's, etc., are not covered by this warranty. Future additional accessories or upgrade packages for the Product(s) are subject to warranty provisions in effect at the time of their purchase. Other goods, such as hard copy imaging devices and other "pass through" accessories, marketed by but not manufactured by Seller, are subject only to those warranty provisions as provided by said manufacturer. Warranty service during the applicable warranty period will be performed by the Seller's authorized Service Agent without charge to End-User during the normal business hours of Seller's authorized Service Agent.

This warranty service is to include parts and the labor from the Seller's authorized Service Agent. Seller reserves the right to determine, and shall disallow claims for, defects caused by End-User's modification, abuse, misuse, excessive ambient temperatures (<50o F or >90o F), or other abnormal conditions of operation. Seller shall repair or replace, at its option, Seller manufactured Product(s) which prove to be defective during the warranty period that are returned to Seller. Spare Part(s) are warranted for ninety (90) days after shipment or for the remainder of the Product(s) warranty, whichever is longer.

Product(s) provided by Seller are designed for operation only with Seller provided software within UL, FDA, CSA, & VDE guidelines. Seller assumes no liability for any non-compliance with these guidelines or operational failures that may result from use of non-Seller provided software for purposes inconsistent with the intent of the Product(s), and this warranty does not cover such failures. This warranty shall not apply to Product(s) which have been subject to misuse, negligence, or accident or which have been repaired or altered in an unauthorized manner or used for purposes for which they were not designed. This warranty shall not apply to a situation where failure of Product(s) is due to a defect in plans or specifications supplied to Seller by Seller's approved Intermediary or End-User. The obligation of Seller under this warranty is limited to the repair or replacement of the defective Product(s) that Seller shall determine, to its satisfaction, to have been defective at the time of manufacture. Seller shall not be liable for any special, direct, indirect, incidental or consequential damages including claims for delay, loss of profits, or labor.

Seller makes no warranty whatsoever regarding site installation by Buyer. THE FOREGOING LIMITED WARRANTIES (1) ARE INAPPLICABLE IF BUYER (SELLER'S INTERMEDIARY OR END-USER), IN ANY UNAUTHORIZED MANNER, ALTERS OR TAMPERS WITH THE PRODUCT, AND (2) ARE APPLICABLE ONLY TO OPERATION OF THE PRODUCT IN STRICT CONFORMITY WITH SELLER'S DEVICE MASTER CONTROL LIST FOR SUCH PRODUCT, A COPY OF WHICH CAN BE SUPPLIED TO THE BUYER ON DEMAND. THE DURATION OF THE WARRANTY PERIOD SHALL NOT BE EXTENDED DUE TO REPAIRS OR DELIVERY OF REPLACEMENT PARTS THAT MAY INTERRUPT THE UP-TIME OF THE PRODUCT(S). THE FOREGOING LIMITED WARRANTIES WITH RESPECT TO PRODUCTS AND PARTS ARE EXCLUSIVE AND IN LIEU OF ANY AND ALL OTHER WARRANTIES OF QUALITY OR PERFORMANCE, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY AND ALL WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR USE OR PURPOSE OR OTHERWISE. ALL SUCH WARRANTIES (OTHER THAN THOSE SPECIFICALLY SET FORTH ABOVE) ARE EXPRESSLY DISCLAIMED.

SELLER'S SOLE AND EXCLUSIVE LIABILITY HEREUNDER OR UNDER ANY PURCHASE ORDER SHALL BE TO REPAIR OR REPLACE EQUIPMENT, PARTS, OR PROGRAMS SPECIFICALLY HEREIN DESCRIBED AND WHICH HAVE BEEN SOLD, LICENSED OR FURNISHED BY SELLER HEREUNDER AND WHICH ARE FOUND TO BE DEFECTIVE WITHIN THE APPLICABLE WARRANTY PERIOD HEREINABOVE PROVIDED, OR, UPON FAILURE OF ANY SUCH REMEDY, TO REFUND TO BUYER THE PURCHASE PRICE OF THE EQUIPMENT, PART, OR PROGRAM WHICH IS THE BASIS OF ANY CLAIM BY BUYER OF LIABILITY AGAINST SELLER. IN NO EVENT SHALL SELLER OR ANY MANUFACTURER OR SUPPLIER OF EQUIPMENT OR PARTS BE LIABLE TO BUYER FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES, WHETHER PURSUANT TO CONTRACT, IN TORT, OR BASED UPON NEGLIGENCE OR STRICT LIABILITY, INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF PROFITS OR REVENUE, LOSS OF USE OF THE EQUIPMENT OR ANY ASSOCIATED EQUIPMENT USED BY BUYER IN CONNECTION THEREWITH, COSTS OF SUBSTITUTION OR REPLACEMENT OF EQUIPMENT, DIRECT AND INDIRECT COSTS OF ANY DELAY OR INABILITY TO OPERATE THE EQUIPMENT, OR OTHER DAMAGES SUFFERED BY BUYER OR ANY OF ITS CUSTOMERS.

Lodox Systems (Pty) Ltd. / Lodox NA, LLC
TERMS AND CONDITIONS OF SALE

NO ACTION OR PROCEEDING SHALL BE FILED OR COMMENCED BY BUYER AGAINST SELLER FOR ANY BREACH OF ANY PURCHASE ORDER OR THESE TERMS LATER THAN ONE (1) YEAR AFTER THE ACCRUAL OF ANY SUCH CAUSE OF ACTION HEREIN STATED IN FAVOR OF BUYER AGAINST SELLER.

9) RETURNS: Seller must authorize all returns. An R.M.A. (Return Material Authorization) number issued by Seller must accompany all returned material. All items returned to Seller must be shipped transportation charges prepaid. Seller does not accept C.O.D. shipments. Buyer is obligated to notify Seller before returning any Product exposed to dangerous or hazardous materials. All returns are subject to a fifteen percent (15%) restocking fee made payable to the Seller immediately upon the request of the RMA number.

10) SHIPPING INSTRUCTIONS: Before returning any product(s) or components to seller for service, Buyer shall contact Seller's Order Services Department (listed below) for a Return Material Authorization number. Product(s) or components shall not be accepted by Seller for servicing without an assigned RMA number. Returned Product(s) and components must be properly packaged, insured, and shipped with transportation charged prepaid to:

LODOX SYSTEMS (PTY) LTD. /. LODOX NA, LLC,

143 Burton Street

Painesville, Ohio 44077 USA

11) *CLAIMS:* Claims by the Buyer shall in no way release Buyer from its obligation to pay herein. Such claims shall be dealt with as a separate transaction.

12) REMEDIES: If Buyer shall fail to make payments in accordance with the prices and terms specified herein, or be delinquent in any other payment owing to Seller, or if Buyer's financial condition at any time does not, in Seller's judgment, justify continuance of work or shipments on the original terms of payment specified herein, Seller may, in addition to all other remedies, require payment in advance for any further work or shipments hereunder or may terminate this Agreement. In the event of bankruptcy or insolvency of Buyer or any proceedings brought by or against Buyer under the Bankruptcy or insolvency laws, Seller at its option may cancel any order that is outstanding from Buyer. If default is made in any of the payments herein, Buyer agrees that Seller may retain all payments that have been made on account of the purchase price up to 20% of the purchase price, as liquidated damages. Seller shall also be entitled to the immediate possession of the Product(s) or Spare Part(s) without prejudice to Seller's right to recover any expenses or damages Seller may suffer by reason of such non-payment. Buyer acknowledges that any waiver on Seller's part of any one default in performance under this

Agreement shall not be considered a waiver of any other such default.

13) PATENT AND COPYRIGHT INDEMNITY: Seller will defend and hold harmless Buyer from and against any claim that the equipment, other products, or programs sold, licensed, or furnished by Seller to Buyer infringe upon any patent or copyright issued to or acquired by any third party in accordance with any applicable federal or state statute, other than a claim pertaining to any process or product thereof, and Seller will promptly pay Buyer any and all costs, damages, and attorneys' fees and related costs awarded to such third party for damages as a result of any such infringement; provided that: (a) Buyer promptly notifies Seller in writing of any such claim or allegation upon which any such claim may arise, and in no event later than ten (10) days following Buyer's receipt of notification of such claim or allegation; (b) Buyer shall provide Seller with such documentation, declarations, testimony, information and assistance as Seller may reasonably request, from time to time, in connection with the defense and/or investigation of any such claim; (c) Buyer permits Seller to exercise complete and sole control over the defense and investigation of any such claim, of any counterclaim or cross-claim, and of any

and all settlement negotiations and decisions with respect thereto; (d) Buyer has not, directly or indirectly, committed any such infringement, other than solely as a result of the use and operation of the equipment, products, and programs as instructed by Seller; and (e) Buyer fully cooperates with Seller in its preparation of its defense of any such claim. Seller shall not be liable for any costs or expenses incurred by Buyer in connection with any such claim unless such costs and expenses have been expressly approved in writing in advance by an authorized representative of Seller.

In the event any such claim of infringement is made, or in Seller's opinion and judgment likely to be made, Seller shall have the right, at its sole option and expense, to either procure for Buyer the right to continue using the product or program which is the subject of any such claim, or to replace the same so long as the replacement product or program shall not result in any such infringement. If Seller determines, in its sole opinion and judgment, that neither of the foregoing options are appropriate under the circumstances, Buyer shall, upon written request by Seller, return to Seller all such products and programs which are the subject of any such claim or potential claim, and Seller shall thereafter promptly remit to Buyer, in full and final satisfaction of all liability of Seller to Buyer with respect to such product and program, Buyer's un-depreciated net book value for such product plus reasonable transportation and delivery costs.

Lodox Systems (Pty) Ltd. / Lodox NA, LLC
TERMS AND CONDITIONS OF SALE

Seller's obligations with respect to any such infringement are and shall be limited to the foregoing obligations to defend, settle, remedy, replace, or reimburse Buyer therefore. SELLER SHALL HAVE NO LIABILITY FOR ANY CLAIM BASED UPON ANY COMBINATION, OPERATION OR USE OF ANY PRODUCT OR PROGRAM SOLD, LICENSED OR FURNISHED TO BUYER IN CONJUNCTION WITH ANY EQUIPMENT OR OTHER SOFTWARE PROGRAMS NOT SOLD, LICENSED OR FURNISHED BY SELLER, OR ANY SUCH CLAIM WHICH MAY ARISE AS A RESULT OF ANY ALTERATION OF ANY OF THE PRODUCTS OR PROGRAMS SOLD, LICENSED OR FURNISHED BY SELLER TO BUYER HEREUNDER OR UNDER ANY PURCHASE ORDER. To the extent any such product, or any part thereof, becomes the subject of a claim of infringement of a patent or copyright issued to or obtained by any third person pursuant to any applicable federal or state statute, Buyer shall indemnify and defend Seller from and against such claim and all losses, damages, costs and expense (including, without limitation, attorneys fees and related costs) incurred or suffered by Seller as a direct or indirect result of any such claim, all in the manner and to the extent provided in the foregoing indemnity provisions applicable to Seller.

14) GENERAL: Orders may not be assigned without the prior written consent of Seller. This Agreement constitutes the entire agreement between the parties with respect to the subject matter hereof and no waiver, alteration or modification of any provision thereof shall be binding unless in writing and signed by an authorized representative of Seller. If any portion or clause of this Agreement is held invalid or unenforceable as to any person or under any circumstances, the invalidity or lack of application shall not impair or affect the other provisions and the application of those provisions which can be given effect without the invalid or unenforceable provision or application. With this intention, the provisions of this agreement are declared to be severable. All notices from one party to the other shall be in writing and shall be delivered in person, by facsimile, or sent by U.S. Registered Mail to each party at the address indicated herein, or at any other, upon notification of the change of address to the other in accordance with this provision. Notice delivered personally shall be

deemed received upon delivery. Notice delivered by facsimile shall be deemed received upon delivery, provided that the original copy of such notice, properly executed by the sender (if required) shall be sent by U.S. Mail, postage prepaid, and received by the addressee within three (3) business days after delivery of the facsimile copy. Notice delivered by registered or certified mail shall be deemed received on the third (3rd) business day after posting.

15) RESOLUTION OF DISPUTES: Each party hereby consents to and confers exclusive jurisdiction to enforce any of the rights or obligations under this Agreement or to resolve any dispute arising out of or in connection with this Agreement, or the transactions contemplated herein, in the United States Federal Court located in Lake County, State of Ohio or the state circuit court located in Lake County, Ohio, and hereby consents to and agrees that venue shall be deemed proper and exclusive in either of such courts in Lake County, State of Ohio.

16) APPLICABLE LAW: This Agreement, and all Purchase Orders related hereto, shall be governed by and construed under the internal laws of the State of Ohio as applied to agreements entered into and to be performed entirely within the State of Ohio, without giving effect to principles of conflicts of laws.