CLINODIGIT OMEGA

Multifunctional DR+DRF system with Dynamic Flat Panel Detector

Product Data

One system
All examinations
No compromises

Cod. PDE-COM Rev. 11

CLINODIGIT OMEGA is a revolutionary system that allows to perform ALL TYPES of DIGITAL RADIOGRAPHY and DIGITAL RADIO-FLUOROSCOPY EXAMS with one single compact unit.

CLINODIGIT OMEGA is equipped with a latest-generation 43cm x 43cm (17" x 17") DYNAMIC FLAT PANEL DETECTOR, thus ensuring exceptional image quality, unsurpassed productivity, and minimal patient dose.

CLINODIGIT OMEGA, thanks to its innovations, dramatically enhances departmental productivity and efficiency, while providing maximum comfort and safety for both patients and operators.

CLINODIGIT OMEGA is a

DIGITAL RADIOGRAPHY SYSTEM

DIGITAL FLUOROSCOPY SYSTEM

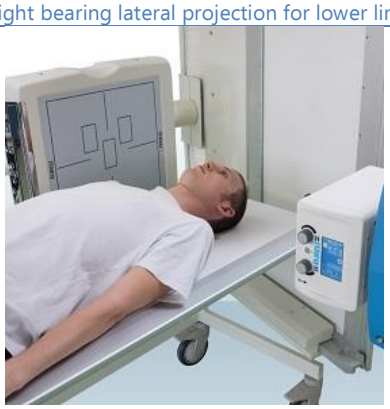
DIGITAL CHEST IMAGING SYSTEM

DIGITAL EMERGENCY ROOM SYSTEM

CLINODIGIT OMEGA:

- ✓ guarantees superb image quality and minimal dose thanks to the extremely high sensitivity, resolution, and contrast of its dynamic flat panel detector
- ✓ enables department productivity enhancement since all examinations can be performed on one single unit thus perfectly adapting to varying morning/afternoon exam type mixes, with maximum return on investment and system utilization
- ✓ delivers an overall costs reduction thanks to its minimized space requirements and reduced training, personnel, and service costs for only one system
- ✓ provides unsurpassed patient comfort with its extremely low tabletop height and the capability of head-to-toe scanning, on both tabletop or external mobile table, with no patient movement
- ✓ is characterized by intuitive ease of use with its innovative touch-screen operator console with exam specific predefined working positions and system settings
- ✓ ensures total connectivity with external RIS/PACS systems via its proven and versatile DICOM 3.0 layer.

TYPICAL EXAMINATIONS FULLFILLED WITH CLINODIGIT OMEGA

 AP thorax exam with 200 cm SID	 Full-spine on a supine patient	 Weight bearing lateral projection for lower limbs
 Merchant projection	 Tomography	 Lateral projection on a stretcher
 Exam with contrast medium	 Trendelemburg	 Fluoroscopy with compression procedure

MAIN CARACHTERISTICS

TTT (Tilting-Table-Top) MOVEMENT

Tabletop motorized movement that removes patient table from detector active area, ALL RADIOGRAPHY EXAMS are now possible with no limitation due to the tabletop presence (exams on a stretcher, exam in contact with detector …).

Furthermore, this movement reduces patient-detector distance and permits patient positioning with no impediments for perfect projections.

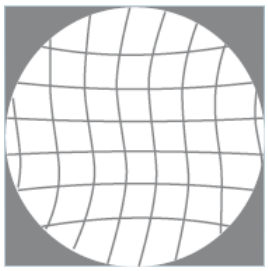
BEST-IN-CLASS 200 cm FOCAL DISTANCE

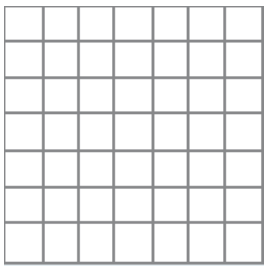
All distortions are eliminated for chest imaging, improving outstanding image quality. This represents an important feature also for full-spine imaging for Stitching procedure.

DYNAMIC FLAT PANEL DETECTOR

CLINODIGIT OMEGA is based on a dynamic flat panel detector featuring amorphous Silicon (a-Si) technology and Caesium Iodide (CsI) scintillator.
With this 43cm x 43cm detector, every anatomical districts can be imaged.

Comparison with a 16" I.I.





The Flat Panel Detector removes the distortion problem typical of systems with Image Intensifier.

Its 16-bit acquisition depth guarantees for an incredible greyscale dynamic range where most subtle details and the most diverse structures can be easily identified without further image retakes.

MAIN CARACHTERISTICS

ALL-IN-ONE TOUCH SCREEN CONSOLE AND PREDEFINED WORKING POSITIONS

All motorized movements (tabletop, column, x-ray tube and detector), are strongly controlled by the "All-In-One" touch screen console positioned in the control room

Predefined system working positions guarantees an unmatched ease of use. Operators can perform the entire examination from the control room hence eliminating any risk of X-ray exposure.

ON-BOARD CONTROL CONSOLE

To further help the operator even in the examination room, on the detector tray there is the small on-board console from which it is possible to drive all the main and most frequent movements of the device.

The operator in this way remains in the examination room, close to the patient, to perform very accurate centering or simply to move the device staying close to the patient.

TOTAL PATIENT ACCESSIBILITY

For the minimum height of patient table, access to examination is granted also to disabled patient, which can be positioned on tabletop without any risk of further traumas.

With patient tabletop at minimum height, CLINODIGIT OMEGA is operative for all examinations, without having to be repositioned to centre of the system, since any further movement can be traumatizing for already injured patients.

90/90 FULLY SIMMETRIC

Footrest can indifferently be positioned both on the right and on the left side.

(*) Optional

MAIN CARACHTERISTICS

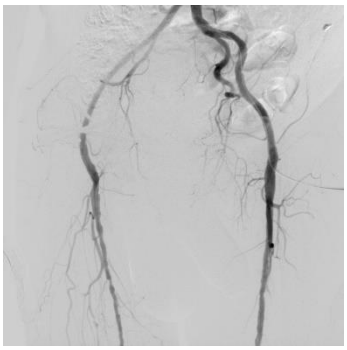
AUTOMATIC STITCHING(*)

The Stitching function involves the automatic acquisition and re-composition of a set of radiography images. Each time a different section of the patient is irradiated until a complete large format image is obtained. This function is fully automatic and typically used for exams concerning the full-spine or full-leg imaging.

Graphic functions(*) available for Stitching exams:
- Level difference;
- Cobb angle;
- Double Cobb angle;
- Right-angle lines;
- Leg measurements;
- Manual Stitching

ANGIOGRAPHY – DSA – ROADMAPPING(*)

Acquisition of radiography images in DSA mode, with variable acquisition rate during exam procedure and automatic start of injector with acquisition (x-ray emission).



Functions available with DSA(*):
- Stenosis measure
- QA Software: to study vessels and stenosis in angio images. The QA function identifies automatically the outline of a section of a vessel and measure its stenosis:
  - reference diameter;
  - min diameter within section;
  - mean diameter of stenosis;
  - mean percentage of stenosis.

This function is selected on angio exams to monitor the passage of the contrast medium in consecutive vessels.

Angio functions:
- Mask pickup;
- Shifting mask;
- Image subtraction;
- Pixel shift;
- Vascular tracing
- Land marking

3D VOLUMETRIC ACQUISITION (TOMOSYNTHESIS)(*)

Tomosynthesis is a limited-angle 3D-technique that allows reconstruction of three-dimensional planes basing on the information contained in the images acquired during a tomographic acquisition.
Tomosynthesis eliminates overlapping structures, increases the separation of adjacent tissues, and provides in-depth information about the structures of interest .

(*) Optional

CONTROL AND SAFETY

COLLISION PREVENTION

All automatic movements are software controlled, in order to avoid collision with surrounding environment (floor, ceiling, walls). The geometric limits of the room within moving the system without collisions are set via software.
Optical sensors around the tube avoid collisions during SID variation, just stopping the column once an obstacle is detected.

In addition to keep everything under control, each movement is only of intentional type (deadman).

DOSE MONITORING

The display, documentation and storage system of the dispensed dose is achieved thanks to the Vacudap DAP meter positioned at the exit of the X-ray tube and connected to an electronic unit for the detection and measurement of the product dose per area (DAP meter). The X-FRAME DRF@ software manages all the dosimetric data acquired in the patient file and generates a report of the individual exposures or of the entire examination. These data can then be exported in DICOM format to a network node. The detected dose values (together with the values of the radiological parameters used in image acquisition) are displayed on the control console monitor and automatically stored in the DICOM file.
In this way the user can always have the RX emission data available, allowing (for Modality Perform Procedure Step service) the exportation also of the details related to the exposure of the patients in a standard format. The data thus available can therefore be sent automatically or upon request to a company analysis system (Radiation Report System) or to the RIS-PACS system.
The DICOM classes necessary to be able to send to PACS together with the acquired images also the information about dose delivered to the patient for each exam, are: **DICOM MPPS (SCU): Sending the examination status to HIS / RIS** and **DICOM RDSR (Radiation Dose Structured Report)**.

INTRODUCED PRECAUTIONS FOR DOSE REDUCTION

1. Use of a high-sensitivity and high-DQE.
2. Automatic control of the exposition that allows to stop exposure as soon as the minimum dose required to the detector is reached (2,5 µGy).
3. Automatic rotating collimator provided with automatic filters for reduction of soft radiation and with an additional filtration system for paediatric applications. This additional filtering can be inserted from the touch screen console and permits a 70% dose reduction providing the same image quality.
4. Anti-scattering and high-density removable grids, to do gridless exam, direct in contact to detector.
5. Dose monitoring with DAP meter and dose data storage together with image archiving.

TECHNICAL SPECIFICATIONS

MOVEMENTS

Tilting	±90° (footrest can indifferently be positioned both on the right 90° and on the left side). Motorized.
Tilting speed	Max. 6°/s
Table top longitudinal travel	Complete patient coverage is guaranteed by the long travel of column/detector assembly
Table top transversal travel	30 cm [-15; +15] cm. Motorized
Tabletop transversal speed	Max. 5 cm/s
Patient Table vertical travel	50 cm
Table top vertical elevation	From 54 cm to 100 cm. Motorized
Table top vertical elevation (with optional under-floor fixing plate))	From 50 cm to 100 cm. Motorized
Tabletop vertical speed	6 cm/s
Table top tilting (*TTT* Movement)	90°. Motorized
Column longitudinal travel	145 cm. Motorized
Column longitudinal speed	12 cm/s
SID	From 115 cm to 200 cm (with programmed stops: 150 cm and 180 cm). Motorized
SID travel speed	6 cm/s
Tube rotation	±45°. Motorized
Tube rotation speed	10°/s
Detector longitudinal travel	145 cm. Motorized
Detector longitudinal speed	12 cm/s
Patient exploration	188 cm just with the movement of tube and detector, with no patient repositioning
Patient exploration in lateral projections (on a mobile table), without repositioning	80 cm
Automatism	1. X-ray tube and detector automatically align for a simple and correct exam execution. X-ray beam and detector centre are kept aligned also during oblique projections. 2. Automatic positioning of x-ray tube and detector depends on the required exam/projection to do, basing on a preinstalled set of predefined working positions. Operator manages this positioning from the touch screen console.

(*) Optional

TECHNICAL SPECIFICATIONS

PATIENT TABLE	
Length	229,4 cm
Width	74 cm
Composition	– Polycarbonate. – Carbon fibre (*)
Filtration for standard table top	< 0,5 mm Al eq @ 70 kVp
Table top – Detector distance	7,5 cm
Detector surface – Image receptor distance	2,8 cm
Patient footrest distance from floor (patient table in vertical position)	14,5 cm
Max. patient weight (full operation)	205 kg
Max. patient weight (limited movements)	230 kg
GRID	
Grid Control	Yes. Automatic
Grid extraction	Yes
Grid type	Stationary
Standard grid	SID: 140 cm - Ratio: 12 - 80 lp/cm
Additional grids(*)	SID: 150 cm; Ratio: 12; 80 lp/cm SID: 160 cm; Ratio: 12; 80 lp/cm
COMPRESSOR(*)	
Compression force (kg)	Set by 3 buttons of programmable values. Halfway steps are 5 kg, 10 kg, and 15 kg
Minimum distance compressor cone/tabletop	10 cm
TOMOGRAPHY(*)	
Angles	10°, 20° and 40°
Speeds	FAST mode: 280 mm/s SLOW mode: 187 mm/s
Tomography exposure times	FAST mode: 2 s (layer height=300 mm, angle=40°) SLOW mode: 3 s (layer height=300 mm, angle=40°)
Tabletop height	From 50 to 86 cm
Layer height	From 0 to 30 cm
TOMOSYNTHESIS(*)	
Angle	40°
Acquired images	60
Acquisition rate	8 img/s
Exposure duration	From 4,3 to 10 s
Scan duration	From 6 to 12 s

(*) Optional

TECHNICAL SPECIFICATIONS

H. V. GENERATOR	Pixel DRF 65 kW	Pixel DRF 80 kW (*)	Pixel DRF 100 kW (*)
Switching frequency	Up to 400 kHz		
Output power	65 KW	80 kW	100 kW
Low ripple	< 1%		
Dual Speed Starter	Yes		
Radiography kV range	40 - 150 kV		
Fluoroscopy kV range	40 – 125 kV		
Radiography mA range	10 - 800 mA	10 - 1000 mA	10 - 1000 mA
Continuous Fluoroscopy mA range	0,5 – 20 mA		
Pulsed Fluoroscopy mA range	5 - 99 mA		
mAs	0,1 – 1000 mAs		
Exposure time	1 - 6300 ms		
Anatomical programs	Yes. Unlimited and managed by acquisition workstation		
Independent Operation	Yes. X-ray Generator can also work independently with other imaging supports i.e. film and/or CR		
Dose Area Product (DAP)	Yes (*), With dose information stored in image DICOM header		
X-ray parameter selection	**1-Point technique**: Ability to perform exams with automatic esposimeter with microprocessor-controlled selection of kV and radiological parameters. Generator starts x-ray emission with max mA allowed by the x-ray tube loading curves. If the esposimeter requires an exposure time incompatible with initial mA value, these values automatically are decreased to obtain the right mAs value for the correct exposure. (Note: 1-point technique allows performing diagnostic exams with very short exposure times). **2-Point technique:** 1. kV, mAs selection 2. Exposure with constant load 3. Use of automatic esposimeter to display min exposure time and max mAs value allowed by x-ray tube loading curves. **3-Point technique :** 1. kV, mA, mAs selection. 2. Exposure with constant load 3. Use of automatic esposimeter to display exposure time after emission. **Programmed anatomic technique:** With this technique, it is possible to program and select several exposure techniques for each anatomic regions, with the possibility to select between different patient sizes. For each type of exam it is possible to store and after, select, the following functions: 1. Detector selection 2. X-ray focus selection 3. Operative technique selection.		

TECHNICAL SPECIFICATIONS

X-RAY TUBE

Type	Rotating anode		
Anode speed	3000 and 10.000 routes/min		
Tube construction	RT-TZM-C		
Tube voltage	Up to 150 kV		
Anode Storage Capacity	1120 kHU		
Maximum heat dissipation rate	160.000 HU/min		
Maximum tube assembly heat content	1700 kHU		
Target angle	13°		
Focal spot number	2		
Focal spot size	Standard: 0,6 x 0,6 mm (s. f.) 1,2 x 1,2 mm (l. f.)	Option 1(*): 0,6 x 0,6 mm (s. f.) 1,0 x 1,0 mm (l. f.)	Option 2(*): 0,4 x 0,4 mm (s. f.) 1,0 x 1,0 mm (l. f.)
Focal spot power	P_{max}=37 kW (s. f.) P_{max}=100 kW (l. f.)	P_{max}=40 kW (s. f.) P_{max}=80 kW (l. f.)	P_{max}=18 kW (s. f.) P_{max}=80 kW (l. f.)
Inherent filtration	0,7 mm Al		

COLLIMATOR

Collimation	Automatic, square field (48 x 48 cm @ 90 cm), remote-controlled
Display	Yes. LCD and touch screen.
Al eq contribution to total filtering	Min 1,2 mm Al
Additional filtration	Automatic, based on selected exam: • 0 mm Al • 1 mm Al + 0,1 mm Cu • 1 mm Al + 0,2 mm Cu • 2 mm Al + 0,3 mm Cu

(*) Optional

TECHNICAL SPECIFICATIONS

DIGITAL IMAGING SYSTEM

FLAT PANEL DETECTOR	**Pixium 4343 FL**
Detector type	Dynamic
Technology	Amorphous silicon
Scintillator	Cesium Iodide (CsI)
Format (ISO 4090)	43 x 43 cm
Effective Pixel matrix	2880 x 2880 pixels
Image depth	16 bit
Pixel pitch	148 µm
Image transfer time	1 s (no preview)
Typical DQE (@ 0 lp/mm RQA5)	65%
Modulation Transfer Function (MTF)	@ 1 lp/mm: 55% @ Nyquist: 7%
Spatial resolution	3,4 lp/mm
ACQUISITION MODALITY	
Continuous fluoroscopy	16 fps (Active area: 43x43 cm - 960x960 pixels) 12 fps (Active area: 30x30 cm - 1024x1024 pixels) 20 fps (Active area: 20x20 cm - 672x672 pixels) 6 fps (Active area: 15x15 cm - 1024x1024 pixels)
Pulsed fluoroscopy	1 ... 15 fps (Active area: 43x43 cm / 30x30 cm / 20x20 cm - 960x960 pixels/ 1024x1024 pixels/ 672x672 pixels)
Radiography	0,5...6 fps (Active area =43x43 cm)
Tomography	Acquisition timing: 2,3 - 4,3 s (Active area = 43x43 cm)
Stitching (*)	Timing for acquisition and image reconstruction: from 15 s to 45 s.
Tomosynthesis (*)	Medium resolution radiography: Exposure duration: from 4,3 s to 10 s. Scanning duration (it considers also required accelerations and decelerations before and after every exposure): from 6 s to 12 s. Total exam duration : Max 2 minutes

(*) Optional

TECHNICAL SPECIFICATIONS

ACQUISITION AND POST-PROCESSING WORKSTATION: X-FRAME DRF@

HARDWARE	
HDD	System hard disk: 250 GB Hard disk for image archive: SATA2 250 GB (320 GB / 500 GB / 1TB available on request)
CPU	Intel® Core™ i7
RAM	8 GB
CD/DVD recorder	Yes (*). External via USB 2.0 port
Operating system	Windows 7 (64bit)
UPS	Yes (*). Emergency power unit system for safe and controlled switch off preventing any data loss or damage
N° storable images	> 16.000 img high resolution for standard HDD
STANDARD MONITOR	
Type	Monitor medicale a colori, 2 MP
Size	24,1
Recommended resolution	1920 x 1200 pixels
Contrast	1000:1
Brightness	350 cd/m^2

(*) Optional

TECHNICAL SPECIFICATIONS

ACQUISITION AND POST-PROCESSING WORKSTATION: X-FRAME DRF@

SOFTWARE	
Image acquisition time	For diagnostic image: 1 s
Image size	15,6 MB (high resolution radiography) 2 MB (pulsed fluoro)
Image enhancement	**everest-X**: image-processing algorithm that simultaneously discriminates high and low attenuation regions corresponding to different grey levels. It is possible to expand the "latitude" of a single image displaying all the relevant clinical details at the same time, without wasting time in window/level adjustments. This is made possible thanks to the hierarchical division of the original image into a number of sub-images that represent different spatial frequency bands, then an intelligent binding process brings together the images to highlight their clinical contents, thus increasing the diagnostic value of the image. Some types of exams (eg, chest, abdomen, extremities etc.) require a specific synchronization of the algorithm with the generator parameters, for the specific exam.
Real time processing	▪ Pulsed fluoroscopy/ continuous fluoroscopy ▪ Harmonization ▪ Auto ROI ▪ DSA (*): - Peak opacification - Road mapping - Digital Subtraction - Auto Masking
Display functions	▪ Oriented Exam LUT ▪ Spatial filters ▪ Harmonisation ▪ H&V image reverse ▪ 90° image rotation ▪ Electronic shutters (square and circular) ▪ Reverse image polarity ▪ Multi-image display ▪ Scaled image, variable (from 1.0 to 2.9) ▪ Zoom, variable (from 1.0 to 3.0) ▪ Brightness and contrast control ▪ Reference images ▪ DSA (*): Remasking, Land Marking, Pixel shift, Vascular tracing, QA Analisys
Graphics (overlay)	▪ Grid ▪ Distances ▪ Angles ▪ Text and marker overlay ▪ Virtual collimator ▪ Linear and angular measures ▪ COBB angle and orthopaedic measurement
Exposure Index	YES
Deviation Index	YES
Multi-language	English, Italian, Spanish, French, …
STITCHING (*)	
Image Paste	Automatic (manual stitching also available)
Max. n° of images	3
Max. length	120 cm
Time for acquisition and reconstruction	From 15 s to 45 s (it depends on the number of images requested to inspect the complete anatomic area)

TECHNICAL SPECIFICATIONS

NETWORKING

DICOM functions	
DICOM Storage (SCU)	Yes. Send Image to PACS
DICOM Modality Worklist (SCU)	Yes. Interface with HIS / RIS with auto refresh option
DICOM Print management Class	Yes. Covers the general cases of printing medical images in standardized layouts.
DICOM Media exchange (DICOM DIR)	Yes (*). Patient images export to DVD/CD
DICOM MPPS (SCU)	Yes (*). Send the status of exams to HIS / RIS
DICOM Storage commitment (SCU)	Yes (*). Send commitment status
DICOM Query / Retrieve (SCU)	Yes (*). Query and retrieve images from PACS
DICOM Storage Server	Yes (*).The DICOM Storage service is used to transfer DICOM images and other related digital data from a DICOM node to another DICOM node.
DICOM Structured Dose Report	Yes (*). To exchange structured data produced in the course of image acquisition or post-processing.
IHE Integration Profile	
Scheduled Workflow	Acquisition Modality : Patient Based Worklist Query / Assisted Acquisition protocol Setting / PPS Exception Management
Patient Information Reconciliation	Acquisition Modality
Consistent Presentation of Image	Acquisition Modality
Radiation Exp. Monitoring	Acquisition Modality
Network	Ethernet TCP/IP

REMOTE ASSISTANCE

Remote access	CLINODIGIT OMEGA is equipped with a remote service system that allows ITALRAY service engineers to have access the system via remote network for servicing and upgrading purposes. The remote servicing system availability is subordinate upon the technical/policy characteristics of the local Hospital network

(*) Optional

TECHNICAL SPECIFICATIONS

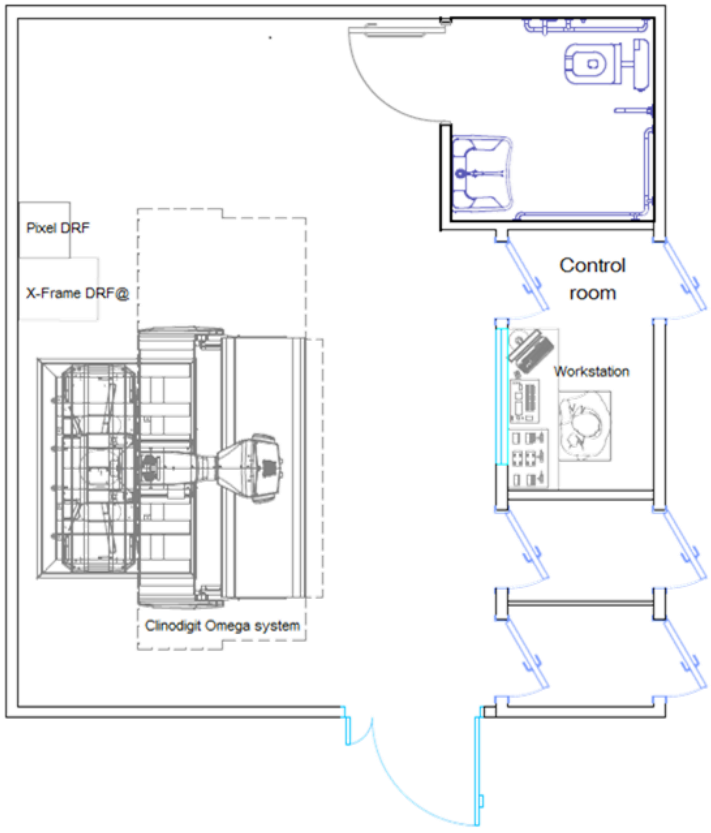
INSTALLATION DATA

Power supply	380 Vac +/- 10%, 50/60 Hz (Optional 220 Vac)
System (CLINODIGIT OMEGA)	DIMENSIONS: 249 x 238 x 183 cm WEIGHT: 1690 kg (with accessories)
Generator cabinet (PIXEL DRF)	DIMENSIONS: 50 x 41 x 105 cm WEIGHT: 91 kg
System cabinet (X-FRAME DRF@)	DIMENSIONS: 65 x 52 x 88 cm WEIGHT: 120 kg

ENVIRONMENTAL CONDITIONS

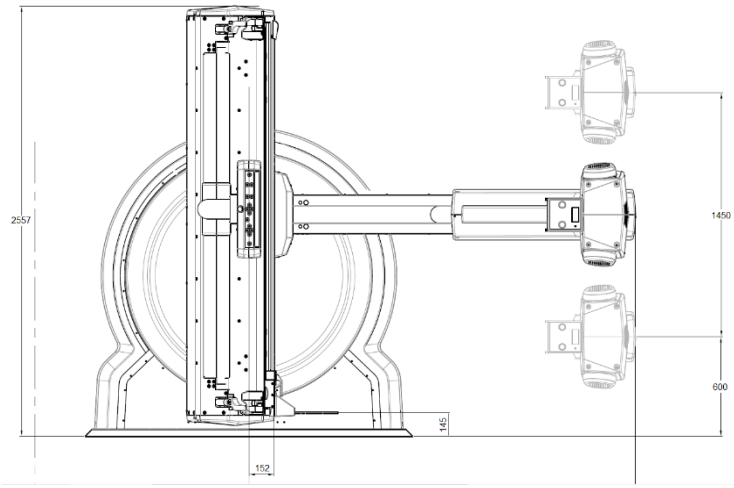
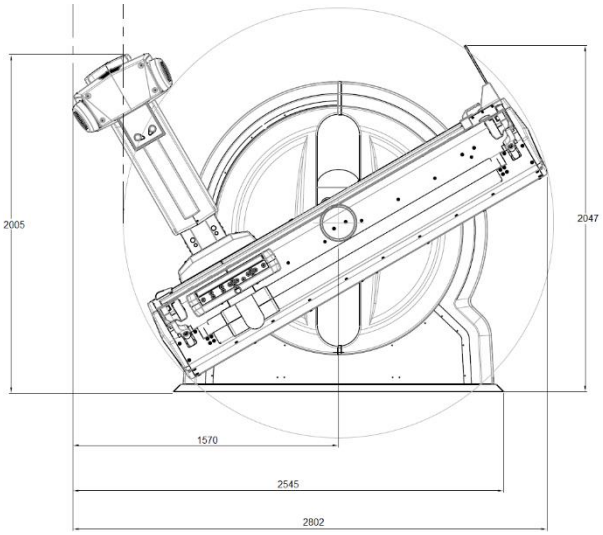
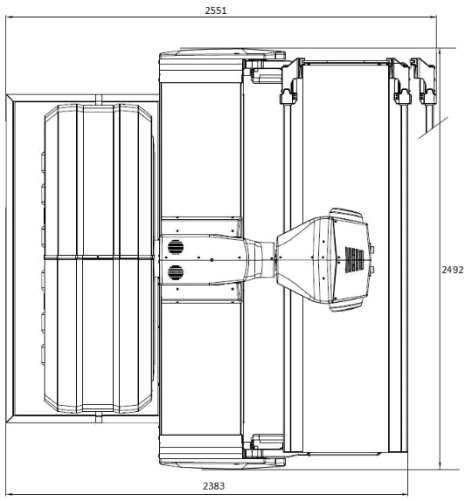
OPERATING	
Temperature Humidity Atmospheric Pressure	15°C ÷ +35°C 30% ÷ 75% 700 mbar ÷ 1060 mbar
TRANSPORT AND STORAGE	
Temperature Humidity Atmospheric Pressure	10°C ÷ +55°C 20% ÷ 80% 500 mbar ÷ 1060 mbar

ROOM CONSIDERATION (TYPICAL LAYOUTS)



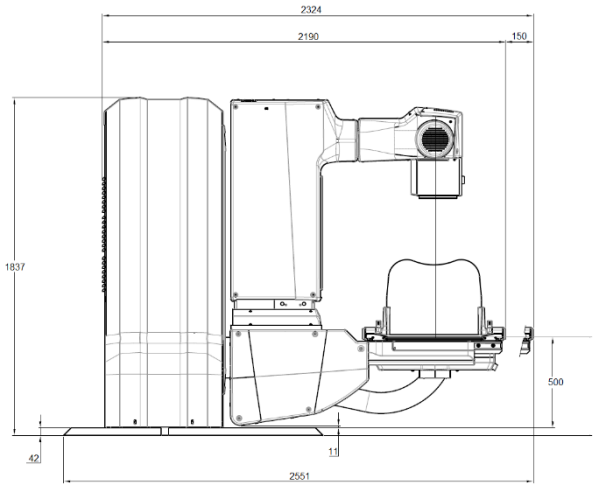
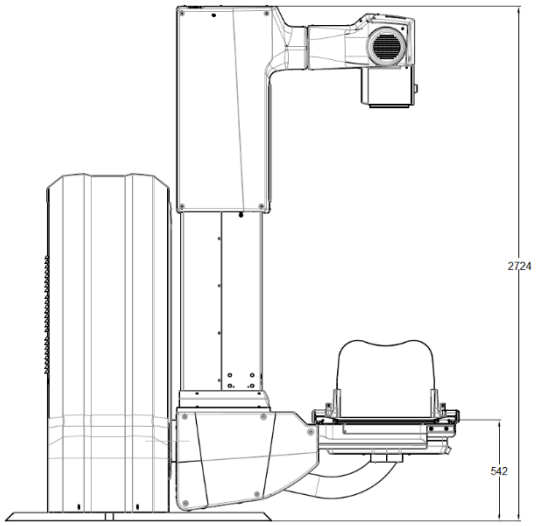
SIZE AND DIMENSIONS

CLINODIGIT OMEGA

FRONT VIEW		
FRONT VIEW		SID: 120 cm – Tilting: 30°
TOP VIEW		

SIZE AND DIMENSIONS

CLINODIGIT OMEGA

LATERAL VIEW		Min. SID – Min. tabletop height
LATERAL VIEW		Max. SID – Min. tabletop height

ACCESSORIES

REMOVABLE PATIENT FOOTREST

PATIENT HANDGRIPS

SHOULDER SUPPORT

COMPRESSION BAND(*), LEG SUPPORTS(*)

ARMPIT SUPPORT (*)

(*) Optional

ACCESSORIES

REMOTE CONTROLLED CONIC COMPRESSOR (*)

ACCESSORY FOR FULL-LEG/FULL-SPINE EXAMS (*)

RADIOTRANSPARENT STRETCHER (*)

MOBILE TROLLEY FOR 1 OR 2 ADDITIONAL MONITORS IN EXAM ROOM (*)

(*) Optional

INSTALLATION AND WARRANTY

INSTALLATION

Only authorized technical personnel that has been appropriately trained by ITALRAY can install CLINODIGIT OMEGA. Upon request, ITALRAY Installation Office can prepare system installation layouts (including eventual construction/electrical)

WARRANTY

ITALRAY guarantees its products for one year from the delivery date. ITALRAY can offer to its customers a wide range of service plans that will perfectly fit all needs and preferences