

X-FRAME DR2T SYSTEM

Chest, General and Trauma X-Ray DR System

Product Data



REV. 9 (September 2017)

X-FRAME DR2T SYSTEM

ITALRAY X-FRAME DR2T SYSTEM is a high productivity system for General, Chest and Emergency examinations and it is composed by:

- ITALRAY **PIXEL CP** X-ray Generator
- ITALRAY **BS45 vertical stand** (optional **TIETON multifunctional stand**) with Flat Panel Detector
- ITALRAY **BTE a radiographic 4-way elevating table** with Flat Panel Detector
- ITALRAY **TELESCOP X-ray ceiling tube stand**
- ITALRAY **X-FRAME DR Digital Acquisition Workstation**
- ITALRAY mobile table (optional)

ITALRAY X-FRAME DR2T SYSTEM increases significantly department productivity featuring high device positioning automation, anatomical programs, predefined working positions and very short time for image displaying.

The ITALRAY PIXEL CP X-ray generator is capable of a tube output frequency up to 400 kHz. Thanks to this feature a very high X-ray beam quality is guaranteed at all load conditions. Once the exam is selected on the digital workstation, all the radiological acquisition parameters are immediately set on x-ray generator. This important feature moreover increasing the department productivity reduces the occasion of errors during exam procedure.

ITALRAY X-FRAME DR2T SYSTEM is based on the solid-state detectors, featuring amorphous Silicon (a-Si) technology and Gadolinium (GoS) or Cesium Iodide (CsI) scintillator: a combination that guarantees high quality X-ray images for immediate diagnosis, in real time and with low exposure.

ITALRAY X-FRAME DR2T SYSTEM versatility is greatly increased thanks to the wireless cassette-size detector that can be positioned either in vertical/horizontal bucky and out of them, in in contact to the patient. This detector is battery powered and employs wireless image data transmission, thus freeing the room from cumbersome and risky cables for an unlimited operation autonomy.

ITALRAY X-FRAME DR2T SYSTEM can be supplied with a number of automatic/motorized movements that greatly enhances system productivity.

The everest-X algorithm automatically optimizes image-processing based on exam type and anatomical region. everest-X enhances image content details in both high attenuation image areas (shoulders, abdomen) and, at the same time, low attenuation image areas (lungs, cavities).

Additional post-processing tools are also available such as Edge Enhancement, Unlimited Zoom and Real Size, Window/Level (auto and manual), Measurements, Annotations, Electronic Collimators, Image Stitching (auto and manual), Deviation Index (DI), Exposure Index (EI). The X-FRAME DR software is integrated with an easily configurable Full DICOM package compatible with any RIS and PACS system or DICOM Printer.

X-FRAME DR2T SYSTEM

ITALRAY X-FRAME DR-2T SYSTEM can be supplied with fixed and/or mobile Wi-Fi flat panel detectors, in order to perfectly fit all customer needs.

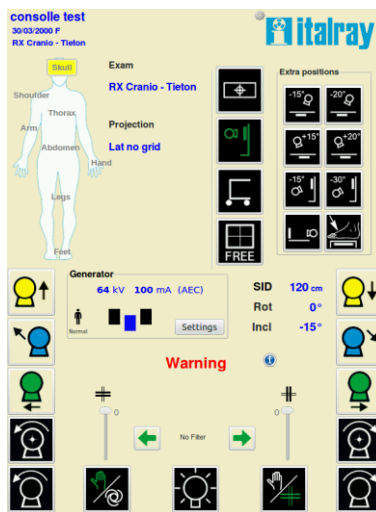
A wide number of configurations are available as shown in the table below:

X-FRAME DR 2T SYSTEMS: DETECTOR CONFIGURATIONS		
N° of detectors	Vertical Bucky	Horizontal Bucky
I) 1 Wireless detector	Wireless	
II) 2 Fixed detectors	Fixed	Fixed
III) 1 Fixed detector + 1 Wireless detector	Fixed	Wireless
IV) 2 Wireless detectors	Wireless	Wireless

MAIN CHARACTERISTICS

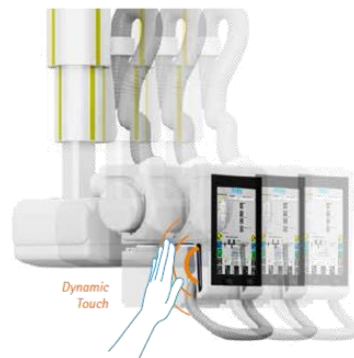
COLOUR TOUCH-SCREEN USER INTERFACE FOR CEILING TUBE STAND (*)

This wide (12") touch-screen control panel makes available in the x-ray rooms, multiple functions to display and edit patient data and acquisition parameters directly in the examination room



DYNAMIC TOUCH (*)

Automatic movements are activated via sensors positioned on both sides of the touch screen console. An additional full system remote control is available from the remote console in the control room.



FULL SYNCHRO REMOTE CONSOLE (*)

All automatic and motorized movements can be easily controlled in the control room, with this ergonomic console. Automatic system position is driven without entering exam room, as soon as the worklist is downloaded.



(*) Optional

X-FRAME DR2T SYSTEM

MAIN CHARACTERISTICS

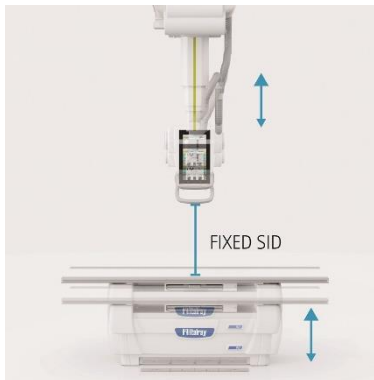
AUTO-TRACKING (*)

X-ray tube and digital flat panel detectors automatically aligned for a simple and correct exam execution. Automatic alignment also in oblique projections.



AUTOFOCUSING (*)

Selected SID automatically maintained during table elevation.



AUTO-POSITIONING (*)

X-FRAME DR2T SYSTEM full automatic positioning is based on selected exam and projection, starting from a set of predefined and customizable system positions. Automatic positioning is controlled both from remote console and from touch screen x-ray tube.



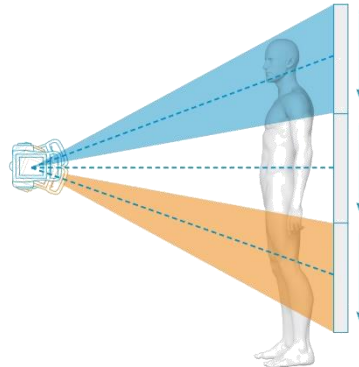
(*) Optional

X-FRAME DR2T SYSTEM

MAIN CHARACTERISTICS

AUTOMATIC STITCHING (*)

For Full-Spine and Full-Leg images, with dedicated orthopaedic tools, X-FRAME DR2T SYSTEM acquires images with a fully automatic and very fast procedure in which X-ray tube and digital flat panel detector move automatically and always aligned. Adjacent images are then automatically stitched together in just one single image.



The entire procedure guarantees a maximum patient comfort and optimal image quality with minimized risk of patient movement thanks to very short exposure times.

TIETON: MOTORIZED TILTING (*)

Automatic motorized detector vertical movement and automatic motorized detector tilting and rotation: all these advanced functions assure maximum system versatility for all applications.



TIETON: AUTO-GRID ALIGNEMENT (*)

Thanks to the automatic motorized detector tilting and rotation movements, grid and ionization chambers are always perfectly aligned in order to perform emergency exams on mobile tables, also for oblique projections.



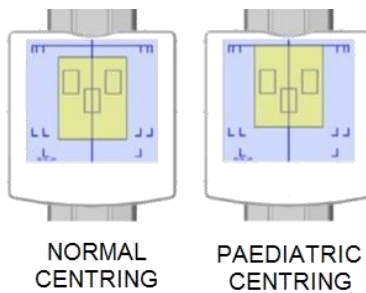
(*) Optional

X-FRAME DR2T SYSTEM

MAIN CHARACTERISTICS

SPECIAL COLLIMATION FOR PAEDIATRIC PATIENTS

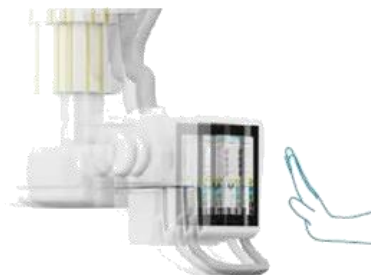
For paediatric patients, the collimation is aligned with the superior border of the detector and not centered on the detector center. In this way patient is not exposed to unnecessary radiation.



CONTROL AND SAFETY

COLLISION PREVENTION

Automatic movements are instantaneously blocked when the proximity sensors detect an obstacle in the direction of motion, only after removing the obstacle, the system restarts. In addition to keep everything under control, each movement is only of intentional type (deadman).



SHARING SOLUTIONS

The wireless digital flat panel detectors can also be shared with ALL other Italray DR and DRF systems, for a maximum optimization of investment.



X-FRAME DR2T SYSTEM

TECHNICAL SPECIFICATIONS

PATIENT TABLE	BTE	BT
Elevating table	Yes	No
Height	55 – 89 cm – Motorized	75 cm
Elevating speed	2,4 cm/sec	-
Max load	280 kg	
Controls	Foot pedals: Elevating Up/ Down, Floating Table Top	Touch-less IR pedals: Floating Table Top
Braking system	Electromagnetic brakes	
TABLE TOP		
Material	Composite	
Size	220 x 77 cm	
Tabletop - detector distance	6,8 cm	
Absorption	< 0,5 mm Al @ 70kVp	
Movement	6-Way movement	4-way movement
Long. travel	± 50 cm	
Tranvers. travel	± 13 cm	
Detector travel	40 cm (Motorized ^(*))	
Patient coverage	183 cm	
Automatic and synchro movement	Auto-centring / Auto-tracking ^(*) (also in oblique projections)	
Detector tray	Predisposed for both fixed and wireless ISO 4090 detector	

^(*) Optional

X-FRAME DR2T SYSTEM

TECHNICAL SPECIFICATIONS

VERTICAL BUCKY	TIETON	BS45
Min Detector Centre Height (Vert. Pos.)	30 cm	44 cm
Max Detector Centre Height (Vert. Pos.)	185 cm	202 cm
Vertical travel	155 cm Manual Counterbalanced. (Motorized ^(*) . Speed: 6,6 cm/s)	158 cm Manual Counterbalanced (Motorized ^(*) . Speed: 6,6 cm/s)
Min Detector Centre Height (Horiz. Pos.)	70 cm	-
Detector tilting	-20° / +90°. Automatic and motorized. With automatic stops at 0°.	-
Detector rotate range (Vert. Pos.)	-90° / +180°	-
Detector rotate range (Horiz. Pos.)	-90° / + 180°. Automatic and motorized	-
Controls	Left and right keyboards: Up/Down, Tilt, Stretcher position, Thorax position, Grid Ejection, Rotation	-
Automatic and synchro movement	Auto-centring / Auto-tracking ^(*)	
Collision Detection	Proximity sensor	
Detector insertion	It is configurable for either left or right side insertion	
Surface plane - film distance	6 cm	
Radiation absorption	< 0.5 mm Al eq @ 70 kVp	
Detector tray	Predisposed for both fixed and wireless detector	

GRID

Grid Control	Yes. Automatic.
Grid type	Stationary or oscillating.
Grid for vertical stand (BS45)	For fixed detector: removable and stationary grid. SID: 140 cm, R12; 203 l/inch.
Grid for bucky table (BT/BTE)	For fixed detector: removable and stationary grid. SID 110 cm – R12 – 203 l/inch. For wireless detector: oscillating grid. SID: 120 cm – R12 – 90 l/inch.
Grid for multifunctional stand (TIETON)	For fixed detector: removable and stationary grid. SID 140 cm – R12 – 203 l/inch.

^(*) Optional

^(**) These data are only indicative and referred to standard configurations. Different solutions can be supplied according to customer needs

X-FRAME DR2T SYSTEM

TECHNICAL SPECIFICATIONS

CEILING TUBE STAND (TELESCOP)

Longitudinal travel	350 cm (longer/shorter length optional). Automatic and motorized movement ^(*)
Transversal travel	218 cm (longer/shorter length optional). Automatic and motorized movement ^(*)
Vertical Travel	150 cm (100, 120, and 180 cm optional). Automatic and motorized movement ^(*)
Minimum focus-ceiling distance	100 cm
Maximum focus-ceiling distance (vertical position)	250 cm (for vertical travel 150 cm)
Rotation of column with respect to its vertical axis	+200°/-135° mechanical stops every 90° (Automatic and motorized movement ^(*)). Cables may limit rotation.
Rotation of Tube-Collimator Assembly with respect to its transverse axis	+120°/-200° (mechanical stops every 90° (Automatic and motorized movement ^(*)). Cables may limit rotation
Console	Handgrip with Ergonomic controls
Standard console Display	LCD Display: SID, x-ray tube rotation angle and error messages.
Multi-functional 12.1" Color TFT-LCD touch screen display ^(*)	<ul style="list-style-type: none"> • Patient anagraphics • Exam information • Radiological parameters • DR-room position (table height, vertical bucky tilt, tube rotation, SID, ...) • Touch-screen controls to position manually the DR room • Selected SID. • Selected collimator filters. • Tube assembly and detector centering. • Operating states such as "Manual", "Ready", "Selected", etc. • Error and warning messages

X-RAY TUBE ^(**)

Anode speed	3000 and 10.000 routes/min
Tube construction	RTM
Tube voltage	Up to 150 kV
Anode Storage Capacity	400 kHU
Housing capacity	1700 kHU
Housing heat dissipation rate	29600 HU/min
Maximum Heat Dissipation Rate	80 kHU/min
Target angle	12,5°
Focal spot size	0,6 x 0,6 mm (small focus) - 1,2 x1 ,2 mm (large focus)
Focal spot power	P _{max} =26 kW (small focus) - P _{max} =63 kW (large focus)
Inherent filtration	0,7 mm Al @ 75 kV

^(*) Optional

^(**) These data are only indicative and referred to standard configurations. Different solutions can be supplied according to customer needs

X-FRAME DR2T SYSTEM

TECHNICAL SPECIFICATIONS

COLLIMATOR

Blade control	Manual. Automatic and Motorized ^(*)		
Collimator rotation	±45°		
Light source	Halogen lamp. LED ^(*)		
Light time on	Default: 20 s (adjustable)		
Collimation	Square field multilayer (0x0 cm – 48x48 cm @ SID=1 m) Laser centering ^(*)		
Al eq contribution to total filtering	Min 1,2 mm Al		
Additional filtration	<ul style="list-style-type: none"> • 1 mm Al + 0,1 mm Cu • 1 mm Al + 0,2 mm Cu • 2 mm Al + 0,3 mm Cu Manual selection / Remote control (motorized) ^(*)		
HIGH VOLTAGE GENERATOR	PIXEL CP 650	PIXEL CP 850	PIXEL CP 1050
Output frequency	Up to 400 kHz		
Output power	50 kW	65 kW	80 kW
Low ripple	< 1%		
kV range	40 - 150 kV. Precision: 1kV		
mA range	10 to 630 mA	10 to 800 mA	10 to 1000 mA
mAs Range	0,1 - 630 mAs	0,1 - 1000 mAs	0,1 - 1000 mAs
Time range	0,001 - 6,3 s. Precision: 77 steps.		
HSS device	Yes ^(*)		
APR	More than 1200 anatomic programs. 3 points technique, 2 points technique, 1 point technique		
Independent Operation	Yes. X-ray Generator can also work independently with other imaging supports i.e. film and/or CR		
Generator Console	Integrated in the Acquisition Workstation (additional console ^(*))		
Automatic Exposure Control (AEC)	3-field sensors		
Dose Area Product (DAP)	Yes ^(*) , with dose information stored in image DICOM header ^(*)		

^(*) Optional

X-FRAME DR2T SYSTEM

TECHNICAL SPECIFICATIONS

DIGITAL IMAGING SYSTEM

FLAT PANEL DETECTOR	Pixium 4343x-E	Pixium 3543 DR	Mars1717
Detector type	Fixed	Portable wireless	Portable wireless
Technology	Amorphous silicon		
Scintillator	Gadolinium (GoS) - Cesium Iodide (CsI) ^(*)		Cesium Iodide (CsI)
Format (ISO 4090)	43 x 43 cm	35 x 43 cm	43 x 43 cm
Active detector matrix (Effective Pixel matrix)	2880 x 2880 pixels	2664 x 2156 pixels	3072 x 3072 pixels
Image depth	16 bit		14 bit
Pixel pitch	148 µm	160 µm	139 µm
Image transfer time	< 5 seconds, Preview in 3 seconds	< 10 seconds, Preview in 3 seconds	< 10 seconds, Preview in 3 seconds
Detector Battery Indicator and Charger	-	Yes and charger for up to 3 batteries simultaneously	Yes and charger for up to 2 batteries simultaneously
Battery charging time	-	Max 4 hours	Max 4 hours
Battery autonomy	-	Up to 10 hour (listen state)	Up to 8,5 hour (listen state)
Battery supplying	-	2 batteries One 3-slot battery charger	2 batteries One 2-slot battery charger
Max.load capacity	-	Distributed: 150 kg Concentrated (ø=8 cm): 100 kg	Distributed: 150 kg Concentrated (ø=8 cm): 100 kg
Typical DQE (@ 0lp and RQA5, per IEC 62220-1)	37% (GoS) - 65% (CsI)	37% (GoS) - 66% (CsI)	55% (CsI)
Spatial resolution	3,4 lp/mm		3,6 lp/mm
Communication interface	Tethered	Wireless / Tethered ^(*)	Wireless / Tethered ^(*)
Synchro with X-ray emission	X-ray push button. <i>Autotriggering</i> mode.		
Internal memory	1 GB (for approximately 80 full resolution images)		

^(*) Optional

X-FRAME DR2T SYSTEM

TECHNICAL SPECIFICATIONS

ACQUISITION WORKSTATION	X-FRAME DR EZ	X-FRAME DR ^(*)
HARDWARE		
HDD	System Hard disk: 64 GB Hard disk for image archive: 320 GB	System hard disk: 32 GB Hard disk for image archive: 1 TB Mirror disk for recovery: 1 TB
CPU	Intel	
RAM	4 GB	
CD/DVD recorder ^(*)	Yes ^(*) . Integrated	
Operating system	Windows Embedded	
Network	Gigabit Ethernet	
Access point	Yes ^(*) . 802.11g/108 Mbps 2,4 GHz Wireless Access Point	
UPS	Yes ^(*) . Emergency power unit system that grants for safe and controlled switch off preventing any data loss or damage.	
Image storage capacity	20.000 images (no compression) 40.000 images (lossless compression)	62.500 images (no compression) 125.000 images (lossless compression)
SOFTWARE		
Image acquisition times	For diagnostic image: < 7 s (tethered) - < 10 s (wireless) For preview image: 3 s	
Image size	16 MB	
Image enhancement	Everest-X	
Display functions	Image Flip/Mirror, R.O.I., Pan/Zoom, Window/Level, Automatic Window/Level, Annotations, Linear and angular measurements, Greyscale Inversion, Image Rotation, Electronic Collimators, Spatial Filters, Multi-Images Visualization	
APR	Yes, preconfigured and editable	
Exposure Index	Yes	
Deviation Index	Yes	
Multi-language	English, Italian, Russian, French, ...	
STITCHING PROCEDURE ^(*)		
Image Paste	Automatic / Manual	
Max. n° of images	3	
Max. length	120 cm	

^(*) Optional

X-FRAME DR2T SYSTEM

TECHNICAL SPECIFICATIONS

ACQUISITION WORKSTATION

STANDARD MONITOR

Type	LCD colour, 2 MP
Size	21,3"
Recommended resolution	1920 x 1080 pixel
Contrast	1500:1
Brightness	300 cd/mq

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 Verification (SCU) ^(*)	Yes ^(*) .
DICOM Query / Retrieve (SCU)	Yes ^(*) . Query and retrieve images from PACS
DICOM Grayscale print (SCU)	Yes ^(*) . Support DICOM printers
DICOM Structured Dose Report	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

REMOTE ASSISTANCE

Remote access	ITALRAY X-FRAME DR SYSTEMS are 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.
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^(*) Optional

X-FRAME DR2T SYSTEM

TECHNICAL SPECIFICATIONS

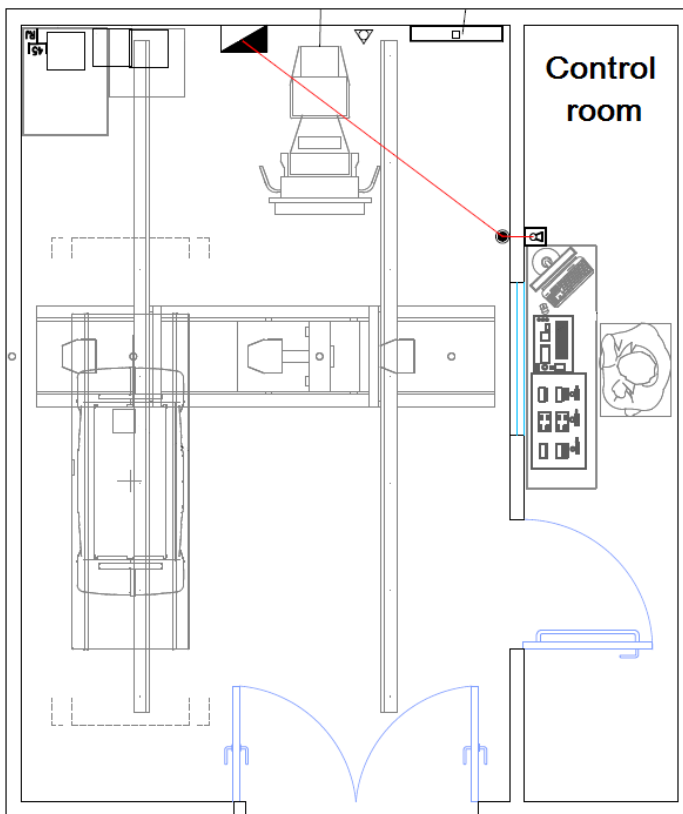
INSTALLATION DATA

Power supply	230 Vac +/- 10%, 50/60 Hz (110Vac ^(*))
Wall stand	DIMENSIONS: 93 x 139 (165 max) x 219,5 cm WEIGHT: 250 kg
Ceiling suspension	DIMENSIONS: 440 x 350 x 150 cm LONGITUDINAL RAILS: 440 cm TRANSVERSAL RAILS: 300 cm WEIGHT: 320 kg
Patient table	DIMENSIONS: 220 x 77 x 55 cm (BTE) - 220 x 77 x 75 cm (BT) WEIGHT: 250 kg (BTE) - 140 kg (BT)
Generator cabinet	DIMENSIONS: 55,9 x 40,6 x 123,7 cm WEIGHT: 107 kg
System cabinet	DIMENSIONS: 55 x 70 x 135 cm WEIGHT: 100 kg

ENVIRONMENTAL CONDITIONS

OPERATING	
Temperature	+15°C ÷ +35°C
Humidity	30% ÷ 75%
Atmospheric Pressure	700 mbar ÷ 1060 mbar
TRANSPORT AND STORAGE	
Temperature	0°C ÷ +50°C
Humidity	20% ÷ 80%
Atmospheric Pressure	500 mbar ÷ 1060 mbar

ROOM CONSIDERATION (TYPICAL LAYOUTS)



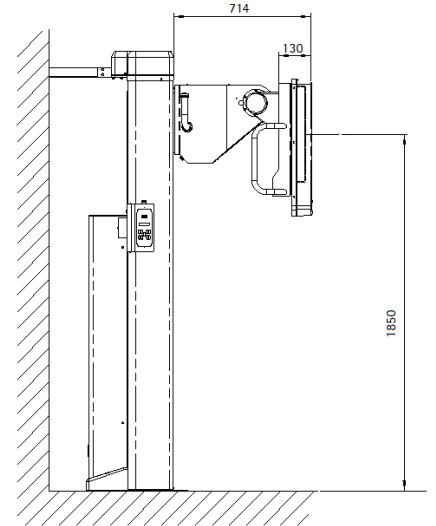
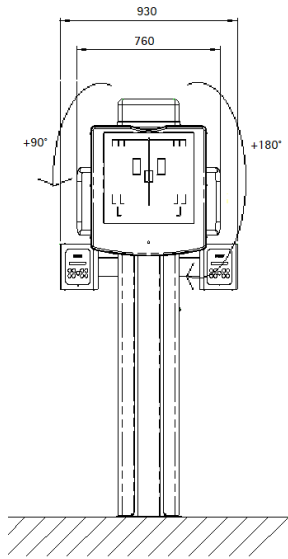
(*) Optional

X-FRAME DR2T SYSTEM

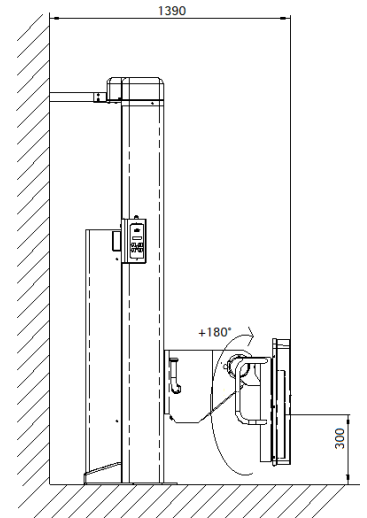
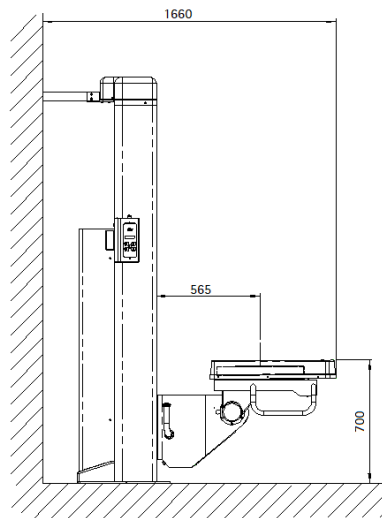
SIZE AND DIMENSIONS

TIETON

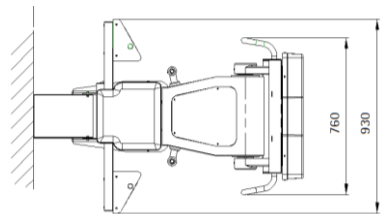
FRONT VIEW



LATERAL VIEW



TOP VIEW

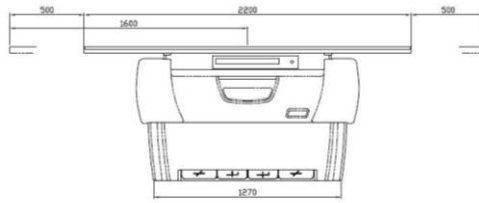


X-FRAME DR2T SYSTEM

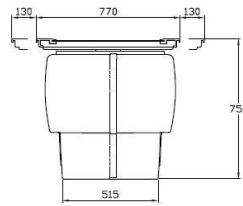
SIZE AND DIMENSIONS

BT/BTE

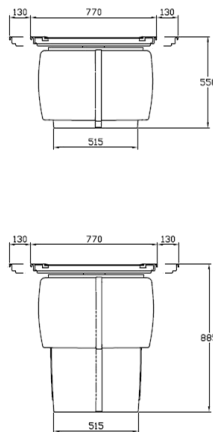
FRONT VIEW



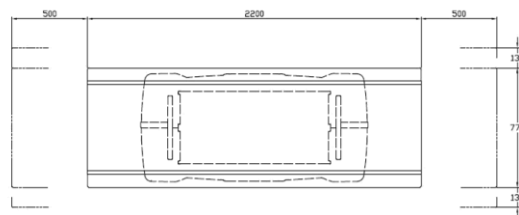
BT LATERAL VIEW



BTE LATERAL VIEW



TOP VIEW

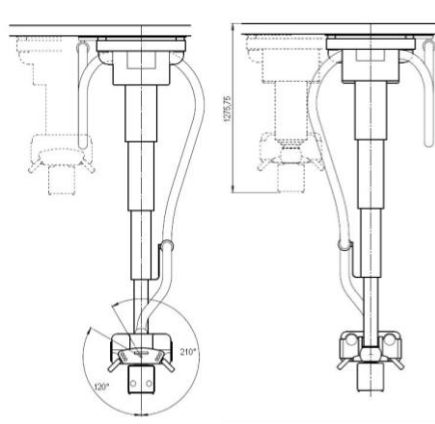


X-FRAME DR2T SYSTEM

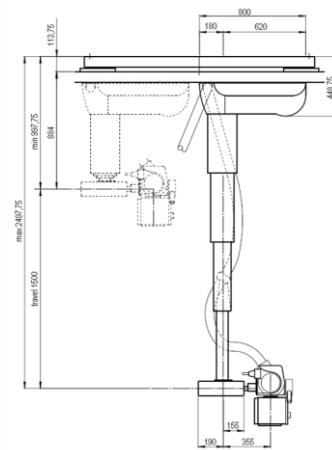
SIZE AND DIMENSIONS

TELESCOP

FRONT VIEW



LATERAL VIEW



X-FRAME DR2T SYSTEM

ACCESSORIES

ACCESSORIES FOR BT/BTE HORIZONTAL BUCKY (*)

Compression band
Handles (couple)
Leg support (couple)



Lateral wireless detector holder for lateral projection on lying patient.



ACCESSORIES FOR VERTICAL BUCKY (*)

Accessory for stitching exams: it supports the patient during several expositions. With double footrest and optional compression band.




(*) Optional

X-FRAME DR2T SYSTEM

ACCESSORIES

ACCESSORIES FOR WIRELESS DETECTOR (*)

<p>Wireless detector holder for weight bearing examinations</p>		
<p>Snap-on Grid System, including 80 lp/cm grid</p>		

(*) Optional

CERTIFICATION, INSTALLATION AND WARRANTY

CERTIFICATION

According to European Directive 93/42 CEE X-FRAME DR2T SYSTEM is a class II b device. X-FRAME DR2T SYSTEM has been developed in compliance with the UNI EN ISO 9001:2008 and UNI EN ISO 13485:2012.

Moreover X-FRAME DR2T SYSTEM complies with the following Technical Norms: CEI EN 60601-series:

- EN 60601-1:2006 Medical electrical equipment– Part 1: General requirement for safety.
- EN 60601-1-2:2007/AC:2010 Medical electrical equipment– Part 1: General requirement for safety. 2- Collateral standard: Electromagnetic compatibility – Requirements and tests.
- EN 60601-1-3:2008 Medical electrical equipment– Part 1: General requirement for safety. 3: Collateral standard:: General Requirements for Radiation Protection in Diagnostic X-Ray Equipment
- EN 60601-1-6:2007 Medical electrical equipment. - Part 1: General requirements for basic safety and essential performance - Collateral standard: Usability

INSTALLATION

Only authorized technical personnel that has been appropriately trained by ITALRAY can install X-FRAME DR2T SYSTEM. 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.

ITALRAY reserves the right to make modifications without any prior notice.



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