X-FRAME DR2S Solution

Chest and General X-Ray DR system

Product Data

ITALRAY **X-FRAME DR2S SOLUTION** is a high productivity floor mounted Digital X-Ray System with state of art image quality, image manipulation, operator control and dose reporting, for General and Chest examinations, with minimal space requirements, with the following configuration:

- ITALRAY **PIXEL CP** X-ray Generator
- ITALRAY **STATIX** floor mounted tube stand
- ITALRAY **BS45** Vertical Wall bucky
- ITALRAY **BTE** radiographic 4-way elevating motorized table
- ITALRAY **X-FRAME DR EZ** Digital Workstation with flat panel detector.

With ITALRAY **X-FRAME DR2S SOLUTION**, flexibility and performances are granted in any application: projections with patient in horizontal/vertical position, chest exams with minimum patient-detector distance, and examinations with grid removal covering any existing routine examination from standing to supine and cross table views.

ITALRAY **X-FRAME DR2S SOLUTION** SYNCHRO is a fully integrated system with all system functions controlled by a single console for both x-ray parameters and image acquisition/processing.

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 DR2S SOLUTION** 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 DR2S SOLUTION** 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 DR2S SOLUTION** 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.

ITALRAY **X-FRAME DR2S SOLUTION** can be supplied with fixed and/or mobile Wi-Fi flat panel detectors, in order to perfectly fit all customer needs.

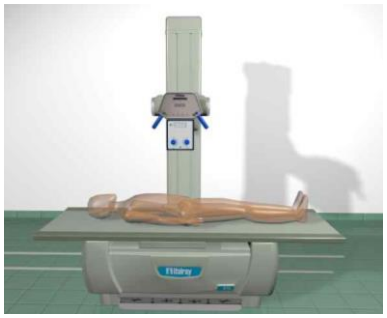
A wide number of configurations are available as shown in the table below:

X-FRAME DR 2S 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 CARACHTERISTICS

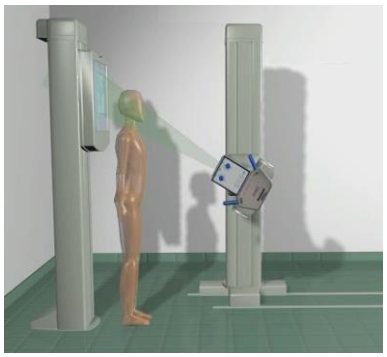
AUTOTRACKING (*)

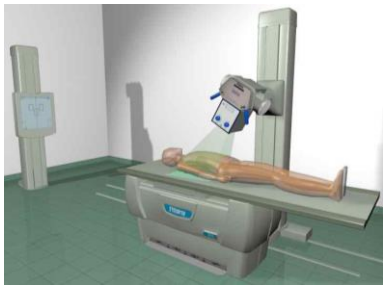
Automatic tube-detector vertical focal distance.



AUTOMATIC CENTERING AND COLLIMATION (*)

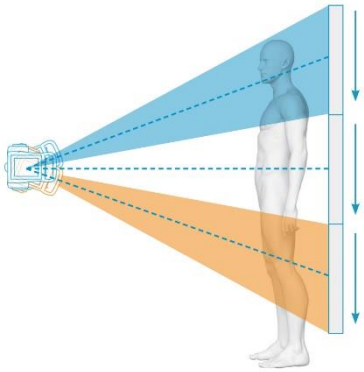
Automatic centering and collimation also in oblique examinations





AUTOMATIC STITCHING (*)

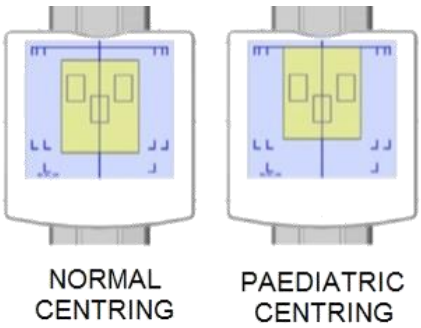
For Full-Spine and Full-Leg images, X-FRAME DR2S SOLUTION acquires images with a fully automatic and very fast procedure (rotational stitching). Adjacent images are automatically stitched together in just one single image.



The complete procedure guarantees a maximum patient comfort and optimal image quality minimizing risk of patient movement with very short exposure times, providing also dedicated orthopaedic tools,

SPECIAL COLLIMATION FOR PAEDIATRIC PATIENTS

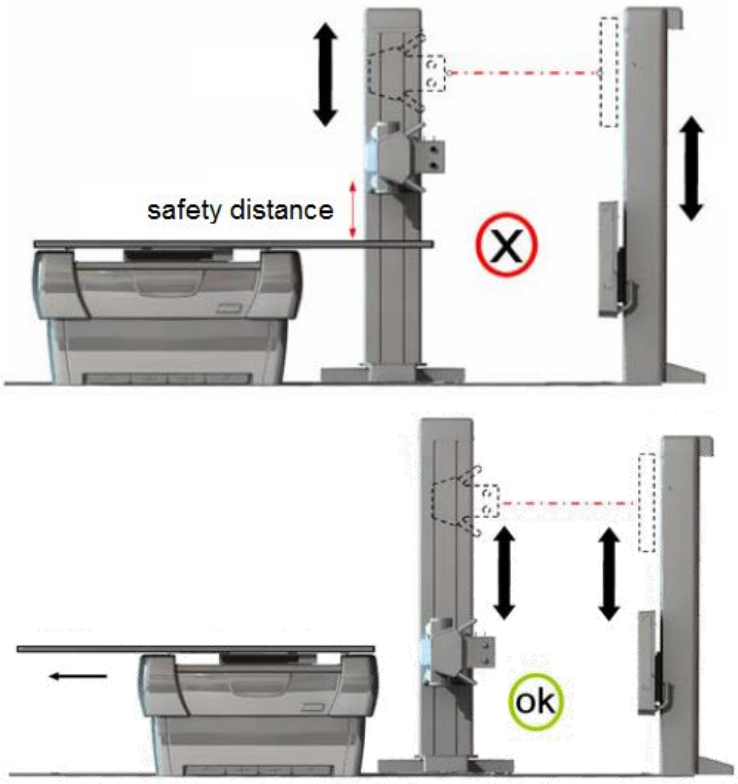
For paediatric patients, the collimation is aligned with the superior border of the detector and not centered on the detector center. In this way patient is not exposed to unnecessary radiation.



CONTROL AND SAFETY

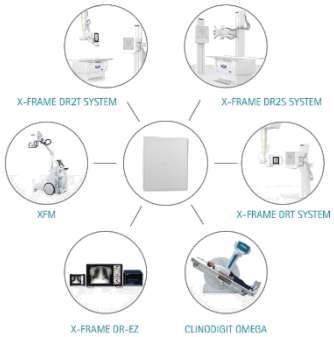
COLLISION PREVENTION

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.



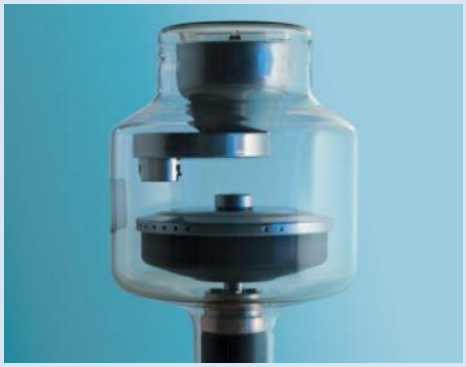
ELEVATING PATIENT TABLE	BTE
	
Type	**6 way elevating floating table top with unscratcheable, water protected surface and electromagnetic breaking system**
Elevating table	Yes
Height	[55; 90] cm adjustable – Motorized
Elevating speed	2,4 cm/sec
Max load	Dynamic max load: 250 kg
Controls	Foot pedals: Elevating Up/ Down, Floating Table Top
Braking system	Electromagnetic brakes. All movements are activated from intentional control, deactivated at rest
Material	Composite (carbon fiber equivalent)
Size	220 x 80 cm
Tabletop - detector distance	6,8 cm
Absorption	< 0,5 mm Al @ 70kVp
Movement	6-way movement
Long. travel	± 50 cm (100 cm)
Tranvers. travel	± 13 cm (26 cm)
Detector travel	40 cm (Motorized (*))
Detector speed	7,5 cm/s
Patient coverage	183 cm
Automatic and synchro movement	Auto-centring / Auto-tracking (*) (also in oblique projections) / Auto focus maintainment during table elevation
Detector tray	Predisposed for both fixed and wireless ISO 4090 detector
Automatic Exposure Control (AEC)	On board with 3-field ION chambers in table and stand
Detector power integrated into bucky	Yes

(*) Optional

VERTICAL WALL BUCKY	BS45
	
Type	**Vertical counterbalanced wall bucky with vertical movement and electromagnetic breaking system**
Min Detector Height (Vert. Pos.)	22 cm
Max Detector Height (Vert. Pos.)	202 cm
Vertical travel	180 cm Manual Counterbalanced (Motorized (*))
Vertical travel speed	6,6 cm/s
Max patient coverage	201 cm
Automatic and synchro movement	Automatic tube detector tracking (*) (also in oblique projections and pediatric investiagations)
Breaking system	Electromagnetic breaks. All movements are activated from intentional control, deactivated at rest
Collision Detection	Anti collision prevention system guaranteed by a 3D map of the room, which takes care of surrounding room dimensions and unit available movements.
Detector insertion	Configurable for either left or right side insertion
Surface – detector distance	6 cm
Radiation absorption	< 0.5 mm Al eq @ 70 kVp
Detector tray	Predisposed for both fixed and wireless detector
Automatic Exposure Control (AEC)	On board with 3-field ION chambers in table and stand
Detector power integrated into bucky	Yes
GRID	
Grid for vertical stand (BS45)	For fixed detector: removable and stationary multifocal grid. SID: 140 cm, R12; 203 l/inch.
Grid for bucky table (BT/BTE)	For fixed detector: removable and stationary multifocal grid. SID 110 cm – R12 – 203 l/inch. For wireless detector: oscillating multifocal grid. SID: 120 cm – R12 – 90 l/inch.

FLOOR TUBE SUPPORT	STATIX
	
Type	**Floor mounted perfectly counterbalanced tube support with vertical, rotation movement of the column and motorized rotation movement of the tube head and electromagnetic breaking system LCD screen with Angle, SID and status indications**
Longitudinal Rails	248 cm Front, 300 cm Rear
Rails Height	2 cm
Longitudinal travel	207,6 cm
Longitudinal movement	Manual
Max X-ray Tube Focus Height	200,8 cm
Min X-ray Tube Focus Height (Vertical beam)	41,8 cm
Vertical stroke	159 cm
Vertical Movement	Manual (standard) – Motorized with Automatic Detector Centering (also for oblique projections) and Automatic Focal Distance(*)
Brakes Type	Electromagnetic brakes. All movements are activated from intentional control, deactivated at rest
Horizontal Axis Tube Rotation Angle	±135° (mechanical stops every 90°)
Vertical Axis Tube Rotation Angle	±90° (mechanical stops every 90°)
Console	Handgrip with Ergonomic Controls
Console Display	LCD, with SID, linear and angular position, and status/error messages. Note: **Note:** Not present if collimator with touch screen is installed. See collimator features

(*) Optional

X-RAY TUBE	Toshiba 7869x
	
Type	Dual focus Rotating anode
Anode speed	3000 and 9.000 routes/min
Tube construction	**RT-TZM-C**
Tube voltage	Up to 150 kV
Anode Storage Capacity	**600 kHU**
Continuous Heat Dissipation	**96 kHU/min**
Maximum Heat Dissipation Rate	**147.900 HU/min**
Housing capacity	1600 kHU
Maximum tube assembly heat content	1500 kJ (**2000 kHU**)
Anode disc diameter	110 mm
Target angle	12°
Focal spot size	06x0,6 mm (small focus) - 1,2x1,2 mm (large focus)
Focal spot power	**24/60kW@3000rpm, 40/102kW@9000rpm**
Min. tube assembly inherent filtration	1.2 mm Al @ 75 kV

COLLIMATOR

	
Type	**Multi leaf motorized automatic collimator with 5'' touch screen display indicating Collimator field, SID and tube inclination. Collimator is provided with retractable tape, filters, adjustable timer and laser light pointer**
Blade control	Manual. Automatic and Motorized (*)
Collimator rotation	±45°
Knobs	For adjusting the collimator field
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	• 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)(*)

(*) Optional

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

HIGH VOLTAGE GENERATOR	PIXEL CP		
			
	PIXEL CP 650	PIXEL CP 850	PIXEL CP 1050
Type	High frequency microprocessor controlled inverter type X-Ray generator		
Output frequency	**Up to 450 kHz**		
Output power	50 kW	65 kW	**80 kW**
Low ripple	< 1%		
kV range	**40 - 150 kV. Precision: 1 kV**		
mA range	10 to 630 mA	10 to 800 mA	**10 to 1000 mA**
Range mAs	0,1 - 630 mAs	0,1 - 1000 mAs	0,1 - 1000 mAs
Time range	0,001 - 6,3 s. Precision: 77 steps.		
HSS (High speed starter)	Yes. Automatic selection of rotational speed on the basis of the chosen anatomical program		
APR	Unlimited editable anatomic programs already programmed for each body part, projection and patient dimension and age.		
Available radiological techniques	**3 points (kV, mA, mS) technique, 2 points (kV, mAs) technique, 1 point (kV, with AEC) technique**		
Independent Operation	Yes. X-ray Generator can also work independently with other imaging supports i.e. film and/or CR		
Console	Directly embedded in the Software on the Acquisition Workstation (FULL DR solution)		
Emergency Stop button	Included in System console		
Automatic Exposure Control (AEC)	**On board with 3-field ION chambers in table and stand**		
Dose Area Product (DAP)	VacuDAP Dosa Area Product meter with digital interface Dose information stored in image DICOM header (*)		

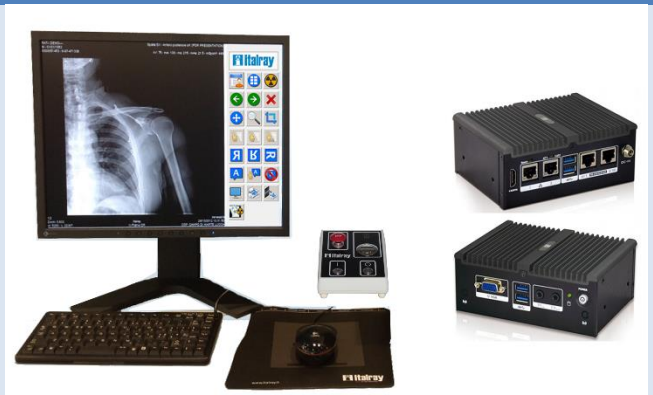
(*) Optional

TECHNICAL SPECIFICATIONS

DIGITAL IMAGING SYSTEM

FLAT PANEL DETECTOR	**iRay Mars 1717**
Detector type	**One piece construction aSi Wifi with Cesium Iodide (CsI) scintillator and retractable handle for easy transportation. Buckies (table and stand) can be equipped with detector auto charging system.**
Scintillator	**Cesium Iodide (CsI)**
Format (ISO 4090)	**43 x43 cm**
Active detector matrix (Effective Pixel matrix)	**3072 x 3072 pixels**
Image depth	**16 bit**
Pixel pitch	**139 µm**
Image transfer time	< 7 seconds,
Detector Battery Indicator and Charger	Yes and charger for up to 2 batteries simultaneously
Battery charging time	Max 4 hours
Battery autonomy	Up to 8 hour (listen state)
Battery supply	2 rechargeable lithium batteries One 2-slot battery charger
Max.load capacity	Concentrated (ø=8 cm): 100 kg
Typical DQE (@ 0lp and RQA5, per IEC 62220-1)	65% (CsI)
Modulation Transfer Function (MTF)	@ 1 lp/mm: 60% (CsI) @ Nyquist: 13% (CsI)
Spatial resolution	**3.59 lp/mm**
Weight	4.5 kg (including battery)
Cooling system	No cooling syste required
Communication interface	Wireless

ACQUISITION WORKSTATION AND SOFTWARE



Type	Acquisition and review workstation includes on board post processing and dicom full package features
HARDWARE	
HDD	System hard disk: 250 GB read only Hard disk for image archive: **1 TB** (extendable)
CPU	Intel i5 Quad Core CPU 660 @ 3,3 GHz at least/ AMD Ryzen 5 CPU @ 3,6 – 4,2 GHz
VGA	GeForce GTX 1660 6GB
RAM	4 GB (extendable to 8 or 16Gbyte)
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	58.500 images (no compression) 125.000 images (lossless compression)
SOFTWARE	
Software name	X-FRAME DR
Patient and exam management	Yes
Real Time image enhancement	Everest-X algorithm takes care of enhancing the clinical diagnostic image details in order to obtain a sharp and well contrasted diagnostic image.
Image Display functions	Image Flip/Mirror, R.O.I., Pan/Zoom, Window/Level, Automatic Window/Level, Soft/hard tissue equalization, Annotations, Linear and angular measurements, Greyscale Inversion, Image Rotation, Electronic Collimators, Spatial Filters, Multi-Images Visualization (Smart Windowing)
APR	YES, preconfigured and editable
Exposure Index	Yes
Deviation Index	Yes
Reject analysis	Yes
Multi-language	English, Italian, Russian, French, …

(*) Optional

ACQUISITION WORKSTATION AND SOFTWARE

ACQUISITION WORKSTATION

STANDARD MONITOR	
Type	LCD colour, 2 MP
Size	23.8"
Recommended resolution	1920 x 1200 (16: 9 aspect ratio)
Contrast	1000:1
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 SERVICE

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.

(*) Optional

TECHNICAL SPECIFICATIONS

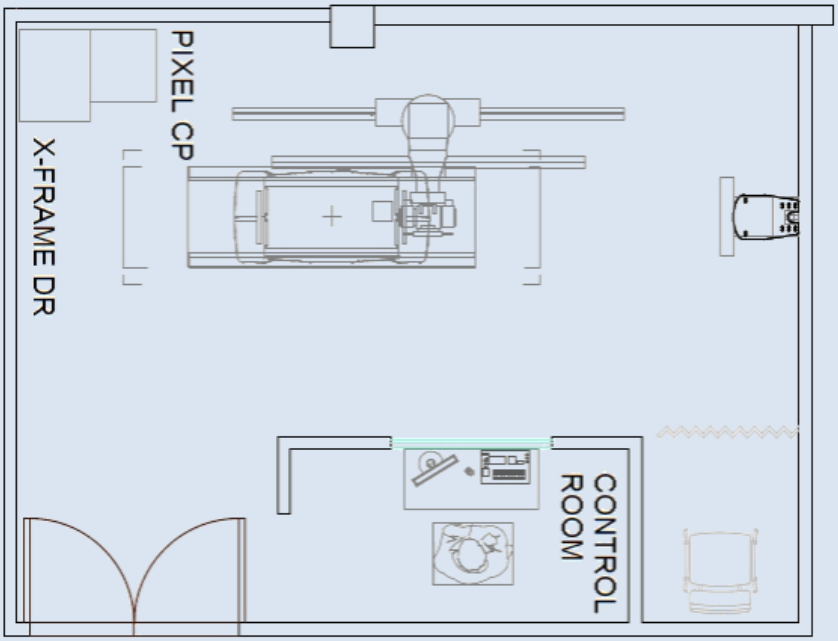
INSTALLATION DATA

Generator power supply	Three phase 380 Vac +/-10%, 50/60Hz
Workstation Power supply	Single phase 230 Vac +/- 10%, 50/60 Hz (110 Vac [*])
Wall stand (BS45)	DIMENSIONS: : 81 x 56 x 229 cm WEIGHT: 200 kg
X-ray tube stand (STATIX)	DIMENSIONS: 300 x 107 x 233 cm FRONTAL LONGITUDINAL RAILS: 248 cm POSTERIOR LONGITUDINAL RAILS : 300 cm RAIL HEIGHT: 2 cm WEIGHT: 219 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 Humidity Atmospheric Pressure	+15°C ÷ +35°C 20% ÷ 75% 700 mbar ÷ 1060 mbar
TRANSPORT AND STORAGE	
Temperature Humidity Atmospheric Pressure	0°C ÷ +50°C 20% ÷ 80% 500 mbar ÷ 1060 mbar

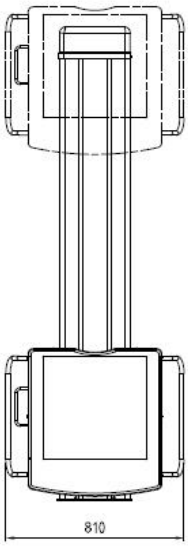
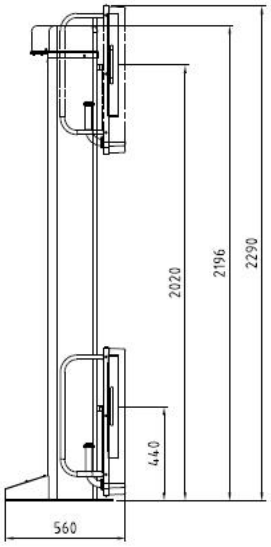
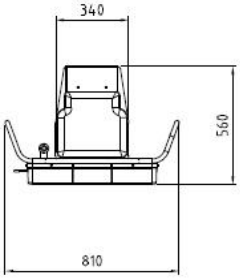
ROOM CONSIDERATION (TYPICAL LAYOUTS)



[*] Optional

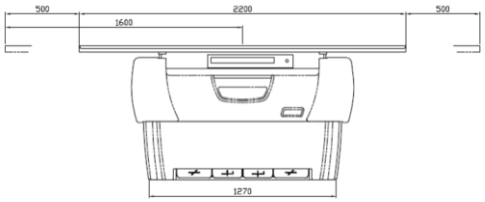
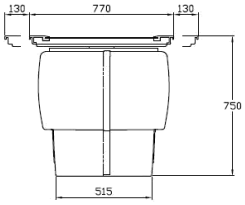
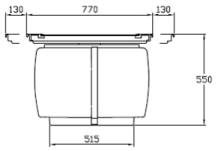
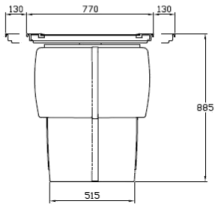
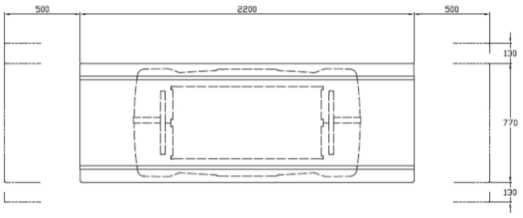
SIZE AND DIMENSIONS

BS45

FRONT VIEW		
LATERAL VIEW		
TOP VIEW		

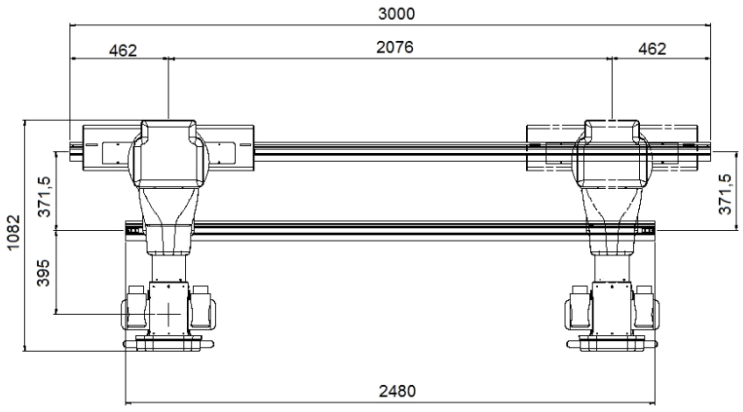
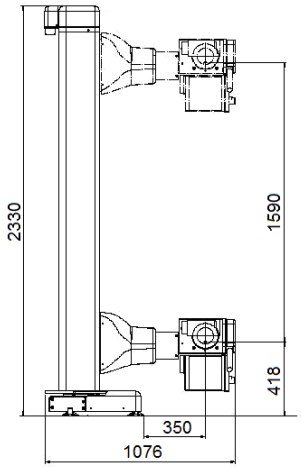
SIZE AND DIMENSIONS

BT/BTE

FRONT VIEW		
BT LATERAL VIEW		
BTE LATERAL VIEW	 	
TOP VIEW		

SIZE AND DIMENSIONS

STATIX

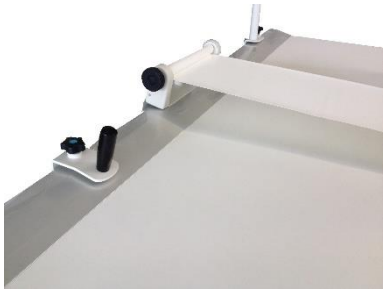
TOP VIEW		
LATERAL VIEW		

ACCESSORIES

ACCESSORIES FOR BS45 VERTICAL BUCKY (*)

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

ACCESSORIES FOR BT/BTE HORIZONTAL BUCKY (*)

Compression band Handles (couple) Leg support (couple)		
Lateral wireless detector holder for lateral projection on lying patient		

(*) Optional

ACCESSORIES

ACCESSORIES FOR WIRELESS DETECTOR (*)

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

(*) Optional