Xperience the future

Philips Allura Xper FD10/10   Functional description

PHILIPS

The evolution of interventional cardiology is creating growing demand for increasingly complex interventions. In addition to ensuring excellent patient management, procedures have to be quick and efficient. To achieve this, cardiologists need superb image quality at a low X-ray dose, instant access to multi-modality information, as well as advanced and easy-to-use image processing tools. Through partnerships with busy cath labs around the world, Philips has developed the Allura Xper FD10/10

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Speed with flat detector image quality

The Allura Xper FD10/10 combines exceptional speed and performance of the geometry with superb flat detector image quality. Whether your focus is Interventional Cardiology, Pediatric Cardiology or Electrophysiology (EP), Philips has developed special features and protocols for the Allura Xper FD10/10 that help you achieve superb clinical results.

Based on the popular Allura Xper FD10, this biplane system features Xper (X-ray Personalized) so you can do your procedures your way. Xper technology enhances the quality of care, streamlines workflows and saves valuable time. Xper settings customize the system to match the interventional cardiologist's workflow and procedures, while the intuitive Xper Module provides all controls at tableside. Xper Integration brings multi-modality information into your work area. The options are virtually unlimited: view 2D, 3D and fluoroscopy alongside MR, CT, and Ultrasound.

Clinicians benefit from advanced diagnostic and interventional tools – such as Philips' Rotational Scan, Allura 3D-CA and StentBoost – which can be controlled and viewed at tableside.

For electrophysiology studies, Xper integrates with the EP-Workmate® with optional Real-Time Management (RPM™) system to control EP recording at tableside and allow the transfer of patient demographics.

Xres is Philips' image processing algorithm that increases image contrast and sharpness, while reducing noise. Its superb image quality further boosts clinical confidence and efficiency.

Xper Integration also creates instant access to previous patient studies across modalities, on demand. This ultimate time-saver delivers critical clinical information, anytime, anywhere.

Bi-plane viewing power and safety

The Allura Xper FD10/10 brings flat detector technology to biplane viewing. This system delivers superb image quality in both the frontal and lateral plane, enabling cardiologists to view them side-by-side. The Allura Xper FD10/10 saves valuable time when capturing accurate 3D information while also reducing x-ray dose and contrast medium.

Safety is critical for pediatric use

In pediatric applications where cardiac anomalies are the norm, biplane imaging provides tremendous benefits. It delivers twice the information with a single contrast injection. Moreover, the system offers full patient access to larger clinical teams. The Allura Xper FD10/10 also offers special pediatric programs and settings developed in partnership with pediatric cardiologists. The Xper table offers optional Tilt and Cradle functionality as well.

Imaging tools optimize care and efficiency. For Interventional Cardiology, the Allura Xper FD10/10 combines multi-modality information and a unique package of diagnostic and interventional tools. Philips' Rotational Scan gives you multi-dimensional views in real-time for more precise diagnosis of vessels.

StentBoost improves visualization of stents in coronary arteries while the guide wire is still in place. StentBoost images help to confirm stent expansion in relation to the vessel lumen and visualize nearby objects, enabling the interventional cardiologist to take any corrective action that is required while the patient is still in the exam room.

Allura 3D-CA, available only from Philips, uses two slices from a Rotational Scan acquisition to instantly construct a 3D model of the heart's vasculature. This model can help the clinician in assessing optimal viewing/working angles and in determining the accurate lesion length. CT Trueview, also a unique Philips' option, provides identical clinical results based on a Philips' Brilliance CT scan.

Allura 3D-RA provides extensive, three-dimensional insight into vascular pathologies from a single Rotational Scan acquisition. It allows the development of better treatment strategies and the selection of the best stand projections for treatment.

Integration

Multi-modality integration saves time and lives. Integration of the Allura Xper FD10/10 system with Xcelera (Image Management System), CT, MR, and Ultrasound means that clinicians and other members of the care team can get the information they need from the exam room and control room to their office or laptop – anytime and anywhere.

Saving space is another critical issue. The Xper Window Switch and MultiSwitch option enable you to share the control room workspot with RIS/CIS, PACS, and Interventional Tools. MultiVision allows images from other modalities to be viewed on the LCD monitors in the exam room, eliminating the need for additional monitors.

Xper provides excellent customization to meet your needs

DoseWise

Philips' DoseWise philosophy is the foundation of the Allura Xper FD10/10's design. The legendary **MRC X**-ray tube with **SpectraBeam** filtration achieves optimum image quality at a low X-ray dose. To further reduce dose, **Xper Beam Shaping** positions shutters and wedges on the last image without using radiation. **Xper fluoro storage** allows recording of fluoro sequences for recall and/or review, eliminating the need for additional runs. The unique dose display makes users much more aware of dose that is used in relation to control of the system, thus protecting patients against radiation skin burns.
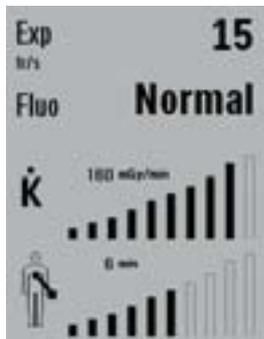
- Easy to understand graphical dose data display
- Provides predictive and actual DAP dose rate indication
- Provides AirKerma patient X-ray dose per body zone:
  - Aimed to help prevent skin burns
  - 10 Cardiac zones defined
  - Graphical AK dose level indication for the actual zone, related to the 2 Gy critical dose level

Other safety features include Philips' **BodyGuard** technology, which senses the patient's position so the stand can rotate safely at high speeds. Also, Philips' unique patient support system is designed so that you can instantly apply CPR to the patient with the tabletop in any position.

The more demanding your cath lab environment, the more you need the Allura Xper FD10/10. It features Xper technology which is designed to improve your personal and departmental efficiency.

- Xper settings provide an advanced level of customization so users can create an interventional lab that meets their individual needs and preferences
- The Xper User Interface provides intuitive system controls and all relevant functionality at the tableside to enhance ease of use
- Xper Integration provides bi-directional information exchange

Xper Module

Available in both the examination and/or control room, the Xper Module communicates user preferences for acquisition settings, automatic position control and processing. An additional option also allows very easy tableside control of quantitative analysis, Allura 3D-CA / StentBoost / Xcelera PACS / Allura 3D-RA and hemodynamics (Xper IM) via the touch screen controls or integrated joystick.

Xper in the examination room

On-Screen Display

The On-Screen Display provides information that includes X-ray indication, rotation and angulation stand positions, Source Image Distance, Air Kerma (rate and accumulated dose per body zone, as well as a predictive value), frame speed, and fluoroscopy mode.
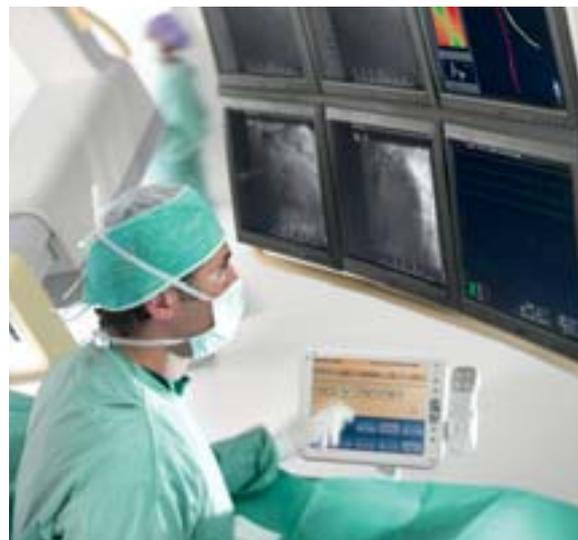
On the reference monitor, the On-Screen Display contains the user interface of the Xper ViewPad, which is used to carry out functions like run and image selection, review speed, active file selection and digital zoom.

Xper Geometry Module

To make operation as convenient as possible, the Xper Geometry Module can be positioned on all sides of the patient table. The Geometry Module automatically adjusts itself to the position to retain the intuitive button operation. It controls tabletop float, table height, Source Image Distance, stand positioning (including memory positions) and optionally, tilt and cradle functionality.

Xper Imaging Module

Like the Xper Geometry Module, the Xper Imaging Module can be positioned on all sides of the patient table, while retaining its intuitive button operation. The Xper Imaging Module allows the user to activate shutter and wedge positioning, fluoroscopy mode as defined via Xper settings, detector field size and beam width.

Both Xper Modules have a removable protection bar that prevents unintended activation of the system.

Xper in the control room

Xper Review Module

The Xper Review Module serves cardiovascular viewing needs. It offers direct control of basic viewing controls like exam and run cycle, contrast, brightness, edge enhancement, and viewing speed (tagarno wheel).

Xper data monitor and Xper review monitor

The Xper data monitor and Xper review monitor use a shared screen and the mouse can be moved over the two monitors. The data monitor provides patient and exam data to assist with all stages of workflow, including scheduling, preparation, acquisition, reviewing, reporting, and archiving. System information is displayed on the bottom of the data monitor.

The intuitive review monitor enables efficient review of exams and control of image processing and Quantitative Analysis Programs.

The image quality you want with low X-ray dose

The Allura Xper FD10/10 features advanced algorithms, a next generation flat detector, and Philips' renowned imaging chain to ensure superb image quality at a low patient X-ray dose.

Dynamic Flat Detector
Philips' 14-bit virtually distortion-free dynamic flat detector offers 184 micron pixels for higher resolution and a DQE(O) of 75% that provides better image quality, especially for low dose fluoroscopy. The compact design with a very large field of view of 25 cm (10 in.) is the optimal size for dedicated cardiology and EP applications. It also offers a refresh light that provides temporal virtually artifact-free imaging by "blanking" the detector, thereby eliminating image glow during dynamic studies.

Xres
Xres is Philips' real-time image processing algorithm. Xres was developed by the Philips Research Laboratories and has been applied in several Philips products, e.g. Ultrasound and MRI. This image processing algorithm provides billions of calculations per frame and is applied to each clinical image in real-time. Xres provides excellent image quality through improved contrast and sharpness. It exploits the benefits of the fully digital detector to reduce noise in clinical images. Each user can customize Xres via Xper settings according to their preferred image quality settings.

Xres also harmonizes the background of an image to provide excellent visualization of coronary arteries in complex projections.

MRC tube
The Allura Xper FD10/10 is equipped with the legendary high power MRC-GS 0508 X-ray tube. The tube's exceptional design provides long life and allows it to withstand high continuous loads, while maximizing heat dissipation. This enables virtually unlimited X-ray sessions without forced cool down delays.

SpectraBeam filtration
The MRC tube works in tandem with SpectraBeam filtration to allow increased X-ray output with better filtration of soft radiation. SpectraBeam offers four levels of filtration - up to one mm Cu equivalent - to reduce patient X-ray dose, while maintaining image quality. The filtration level can be programmed via Xper settings. The fluoroscopy mode can be selected at tableside.

Monitors
The LCD progressive display monitors are virtually flicker-free to prevent physician eyestrain. In the control room, the 19-inch LCD color monitor and two 18-inch LCD black and white monitors are standard. In the exam room, four 18-inch LCD black and white monitors are standard. For each plane it provides the live monitors and the reference monitors.

MultiVision video switch
MultiVision allows images from different image sources to be viewed on the monitor in the exam room, eliminating the need for multiple monitors.

Fluoro storage
Xper fluoro storage lets you store and review the last fluoroscopy run (service configurable time).

Xper Beam Shaping
Xper Beam Shaping allows the wedges and shutters to be positioned without using X-ray radiation.

Rotational Scan
Rotational Scan saves time, contrast medium and X-ray dose by creating real-time 3D impressions of complex vasculature and coronary arteries with multiple projections – all from just one contrast injection. The Rotational Scans can be sent to an interventional tool for a 3D reconstruction.

Integration features that enhance workflow

The combination of advanced integration features and Xper settings, which personalizes image transfer, archiving and printing, make the Allura Xper FD10/10 an excellent workflow-friendly system. Now your department can run the way you want it to, with efficiency enhancers that give you more time for patient care.

Xper DICOM Image Interface

The Xper DICOM Image Interface provides fast export of clinical images in Cardiac DICOM XA Multi Frame or DICOM Secondary Capture. Images can be sent in different formats to any DICOM-compatible device, and can be sent to several destinations, as configured via Xper settings. In addition, with DICOM Query/Retrieve, older DICOM studies can be uploaded into the system.

Continuous autopush

The continuous autopush option allows uninterrupted image transfer in the background during procedures, so that you do not have to wait for the system after each case or delay archiving until the end of the day.

RIS/CIS DICOM Interface

The RIS/CIS DICOM interface option uses DICOM Worklist Management (DICOM WLM) and Modality Performed Procedure Step (DICOM MPPS) standards to enable two-way communication between the system and a local Information System.

MultiSwitch / Xper Window Switch

The MultiSwitch option lets you share the Xper workspot in the control room with other applications that are loaded on separate PC modalities, such as StentBoost / Allura 3D-RA / Allura 3D-CA / Xcelera and Xper IM. Xper Window Switch functionality is included standard and enables integrated network functionality in the control room. It lets you switch to data-oriented CIS/RIS applications that are available on the network.

Quantitative Analysis Packages

The optional software packages are clinically validated and aid reliable diagnoses. The Coronary Quantification package measures stenosis of the coronary arteries, while the Left Ventricular Quantification and Right Ventricular Quantification software packages calculate ejection fraction and wall motion parameters.

Floor mounted G-stand　　　　　　High output MRC X-Ray tube　　　Biplane foot switch　　　Xper table
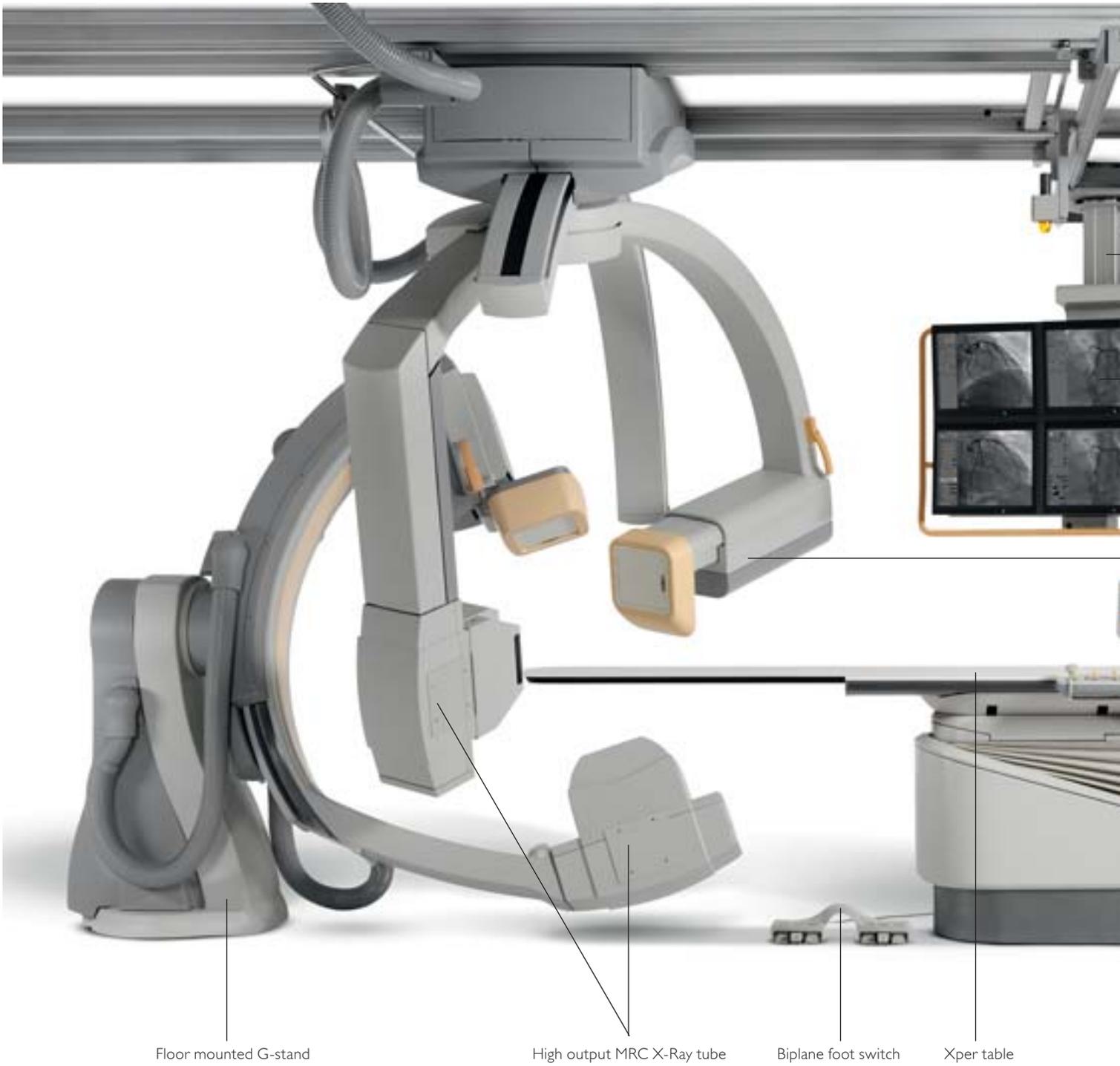
Flexible monitor ceiling suspension with height adjustment

LCD monitors

Lateral Arc (LARC)

Xper Module
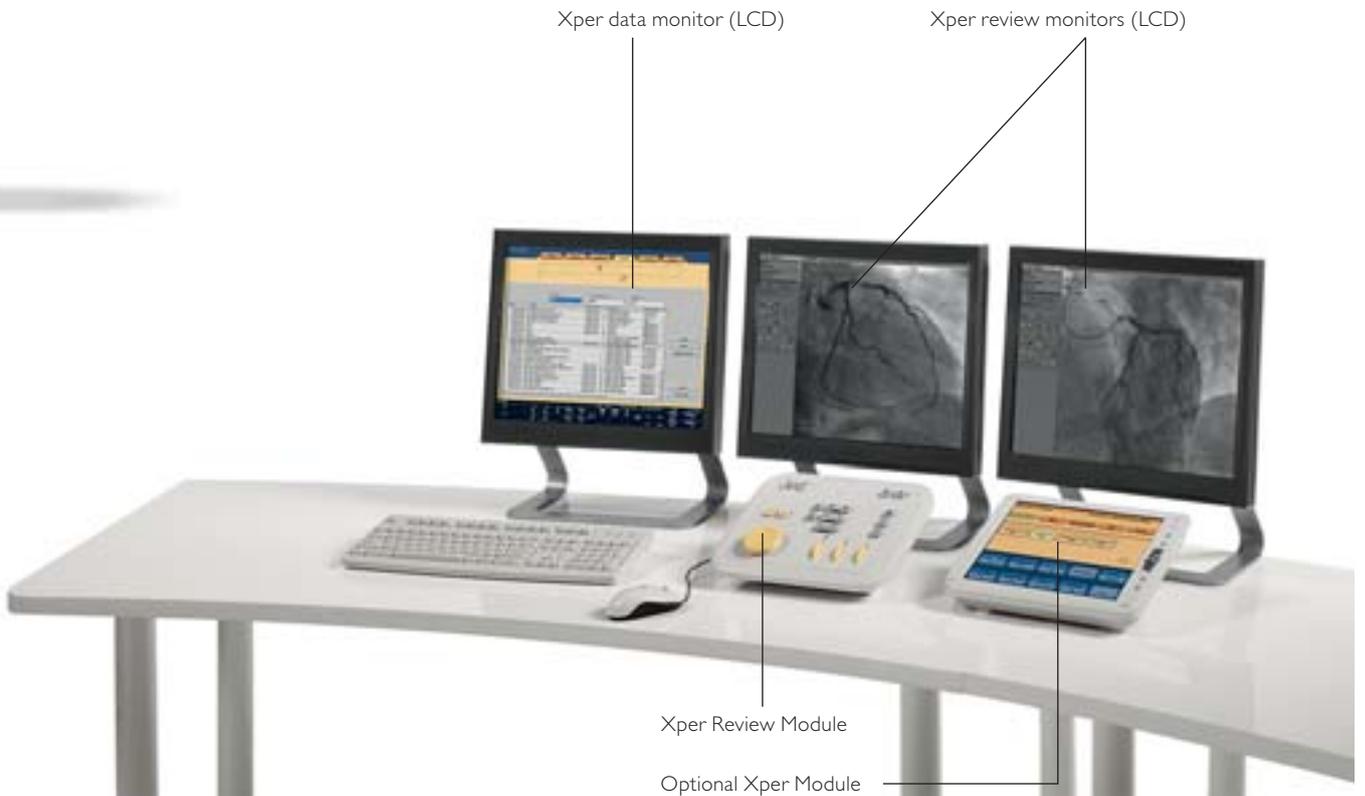
Xper data monitor (LCD)

Xper review monitors (LCD)

Xper Review Module

Optional Xper Module

Technical information - Geometry

The geometry of the Allura Xper FD10/10 is designed for fast and flexible imaging. The system is equipped with a very compact, fast-moving gantry that provides excellent patient access and speeds up procedures, as well as a dedicated patient support table and very flexible, ceiling-suspended TFT-LCD monitors.

G-shaped Gantry

The compact, motorized, floor-mounted G-arm provides excellent patient accessibility from all sides. The large diameter of the G-arm allows virtually all cardiac projections, even with obese patients. Two projections can be stored and recalled for faster positioning.

Specifications:
- Suitable for all ceiling heights
- Depth of G-arm: 105 cm (41,3 in.)
- Ultra-flexible projection angles
  - Angulation from 45° cranial to 45° caudal, rotation from 120° LAO to 120° RAO
- Motorized rotation speed: maximum speed up to 25°/second with variable speed, configurable via Xper settings (max 8°/second in biplane operation)
- Motorized angulation speed: maximum speed up to 18°/second with variable speed, configurable via Xper settings (max 8°/second in biplane operation)
- Storage and recall of two single plane or biplane scratch positions
- Isocenter to floor distance: 106.5 cm (41.9 in.)
- Focal spot to isocenter distance: 76.5 cm (30.1 in.)
- Focal spot to flat detector distance: 86.5 to 123 cm (34.1 to 48.4 in.). The detector can be positioned manually or via motorized movement
- The Gantry can be rotated for parking to provide system-free patient accessibility
  - Can be moved manually or motorized at a speed of 12°/second, with autostop
  - Automatic snap positions at -90˚, 0˚ and 90˚

Double C-arc (LARC)

Philips' unique ceiling-mounted, double C-arc can be independently rotated and angulated to provide full caudal and cranial angulations for all LAO projections. The C-arc is moved via a precision motorized drive. The counterbalanced flat detector delivers precise motorized and fast manual movements. The C-arc is easily parked by moving it manually along the ceiling rails.

Motorized parking is also available with an autostop in the isocenter. The compact flat detector and the design of the ceiling mounting create maximum floor space and unprecedented accessibility around the patient.

Specifications:
- Ceiling suspended double C-arc
- Motor-driven rotation: 0˚ LAO to 90˚ LAO
- Motor-driven angulation: 45˚ cranial to 45˚ caudal
- Rotation speed: 8˚/second
- Isocenter to floor: 106.5 cm
- Focal spot to isocenter: 76 .5 cm
- Focal spot to flat detector: 87.5-130.3 cm, manual and motorized movement
- Manual or motorized longitudinal movement for parking or positioning.
  - Autostop in Iso center
  - Motorized movement:
    6 cm/second inside working area
    12 cm/second outside working area
- Nominal ceiling height: 29 0 cm

BodyGuard Patient Protection

In single plane, with the LARC in a park position, BodyGuard enables the use of high-speed rotation and angulation. It uses "non-contact" proximity sensors to detect the position of the patient or objects. The combination of G-arm geometry and Philips' exclusive BodyGuard sensing achieves a level of

control that is not possible with conventional high-speed motorized C-arm configurations. These high-speed stand designs use a pre-set "one-size-fits-all" program, resulting in a so-called "safety envelope" that is too large to be practical.

With BodyGuard's continual capacitive sensing, the system adapts to individual patient size. The system slows down or stops moving when a patient or object gets too close. BodyGuard has an override function to allow full gantry positioning control at all times. In addition, BodyGuard uses motor current sensing (the electronic equivalent of a slip clutch) to safeguard all stand movements.

The counterbalanced flat detector incorporates these sensing technologies, along with a mechanical slip clutch, to control motorized and manual movements.

Rotational Scan
Rotational Scan is performed with the floor mounted G-stand only and the LARC in park position.
The optional Rotational Scan acquires a range of projections with just one contrast injection to create real-time, 3D impressions of complex vasculature and coronary arteries. It can save considerable time and contrast medium, while providing the image detail that is required for diagnostic and therapeutic decisions.
The high speed Rotational Scan decreases contrast medium, while the wide rotation range provides a complete evaluation of the anatomy. The stand's excellent stability enables precise positioning and high reproducibility which results in high quality images.

Specifications:
- Poly Diagnost G
  - Maximum rotation speed: 55°/second
  - Maximum rotation angle: 240°
- Frame speeds: 15 fps to 30 fps. Xper settings can be used to set speed, as well as a start and end position
- The clinical images from the Rotational Scan are the basis for the interventional tools that provide a reconstruction of static vasculature (Allura 3D-RA) or a coronary 3D model (Allura 3D-CA)

Automatic Position Controller
Automatic Position Controller (APC) functionality is accessed through the Xper Module, normally at table side. The APC provides two modes of operation:
- Sequence mode:
  A sequence of up to 10 projection positions (angulation/rotation) per acquisition protocol can be preprogrammed (service configurable) via Xper settings and selected via the Automatic Position Control. Each position can be a single plane or biplane projection. The sequence can be defined for routine diagnostic procedures, but each projection can also be randomly selected, and thus efficiently support interventional procedures.
- Reference-driven mode:
  This mode is geared to support interventional procedures: single or biplane stand position can be recalled in relation to the actual image on the reference monitors, which means that the rotation, angulation, and SID of the stand(s) are restored to the original settings of the reference image.

Xper table
The Xper table is a dedicated cardiovascular table with a free-floating tabletop. This table has very high patient loadability and can make a large longitudinal floating movement.

Technical information - Geometry

Specification:
- Radio translucent carbon fiber tabletop
- Tabletop length: 319 cm
- Tabletop width: 50 cm
- Motorized height movement: From 79 – 107 cm
- Tabletop metal free overhang: 125 cm
- Free float at 0 degrees tilt
- Longitudinal float: 120 cm
- Transversal float: 36 cm
- Maximum allowable patient weight: 250 kg (550 lbs) with additional force of 500 N (100 kg/220 lbs) allowed in case of CPR. CPR can be performed while the tabletop is set in any longitudinal position
- Pivot over 270 degrees
- Comfortable patient mattress
- The Xper Module, Xper Imaging, and Xper Geometry Modules can be positioned on three sides of the patient support
- Cables incorporated in the table to allow maximum operational flexibility

Table tilt
The optional isocentric table tilt enhances the accuracy and efficiency of gravity-oriented procedures. It is ideal for interventional, myelography, phlebography and head-down procedures because it provides more precise imaging of contrast medium, blood, or objects in the body. As the table tilts, the X-ray beam automatically coordinates to the movement to keep the region of interest in the isocenter of rotation and angulation of the stand. If the longitudinal position of the stand changes, the tilt isocenter is changed to match with the new stand position. As a result, the region of interest is always centered. As the table tilts, the X-ray beam automatically coordinates to the movement.

Xper table - tilt

Specifications:
Maximum tilt range: -17˚ (head-down) to +17˚ (head-up). Tilt speed: 2 degrees/second
- Automatic safeguarding system with manual override
- Panning range in tilted plane: equal to standard panning range

Table tilt & cradle
In addition to the table tilt functionality, this option enables you to tilt the tabletop in a cradle movement. This enables optimal positioning of the patient for procedures, such as more invasive (surgical) or guided puncture interventions.

Specification:
- Isocentric cradle
- Maximum cradle range: -15˚ to +15˚ for the full tilt range
- Cradle speed: 3 degrees/ second

Xper table - cradle

Table Automatic Position Controller
This feature provides Auto Isocenter height positioning, based on the patient weight that has been entered. After the patient weight is entered in the Xper system (manually or automatically via the RIS interface), the table height will be adjusted to the level that puts the center of the heart in the isocenter of the X-ray system. This especially saves time and X-ray dose for the start of an exam. This feature is based on an advanced algorithm from the clinical University of Kiel (Study by Professor R. W.R. Simon). It also offers store and recall functionality of the height, longitudinal, and lateral position of the tabletop. This allows you to return to your exact previous position, without using X-ray dose.

Pivot

The table-based pivot option is designed for angiographic and interventional procedures of the upper peripherals. It provides improved table access for patient transfer. This option also enables the table to pivot around its vertical axes. The pivot range moves from -90˚ to +180˚ (or -180˚ to +90˚) with locked positions at 0˚, -13˚, and +31˚ (to facilitate arm angiography) and -90˚, +90˚, and 180˚.
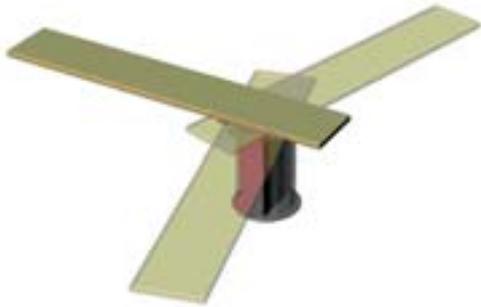
Pivot

PAN handle

The PAN handle is a tabletop float control extension, which can be attached to any side of the table. This additional PAN handle works in a master/slave configuration.

Ergonomic PAN handle

Monitor Ceiling Suspension

Monitor Ceiling Suspension

The Monitor Ceiling Suspension enables you to freely rotate and adjust the height of two, four or six monitors.
• Monitors rotate freely on the ceiling suspension over a range of 350˚
• Suspension moves transversely over a distance of 300 cm (118.1 in.) and longitudinally over a distance of 330 cm (129.9 in.)
• Allows motorized height adjustment over a maximum range of 32 cm

Ceiling Suspended Radiation Shield

This radiation shield protects against scatter radiation to the eyes and to the upper body of the physician and staff. The

shield is mounted on the ceiling monitor carriage with a two-section suspension arm that allows free positioning of the shield. It can be used in combination with the table mounted, lower body radiation shield.

Table Mounted Radiation Shield

The table mounted radiation shield provides additional protection for the physician and staff against scatter radiation. The shield consists of two protective parts: a lower shield and an upper shield.

Specifications:
• Can be mounted on the right or left table accessory rails
• Can be pulled into the required working position and parked underneath the tabletop to facilitate patient preparation
• The upper shield can be positioned upright for optimal protection or can be folded down to allow free access to the patient

Table Mounted Radiation Shield
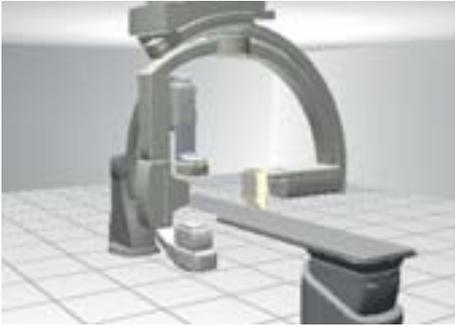
The focal spot to flat detector distance is variable over a wide range

In both channels the stand can rotate and angulate independently

The frontal stand can be angulated from 45° to 45° caudal
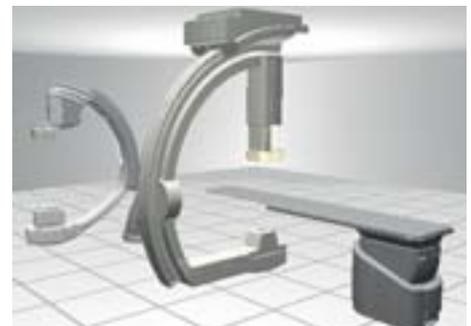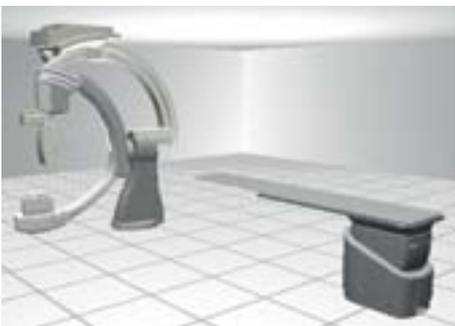
Both the frontal and lateral stand can be parked away, leaving the patient support isolated with open space all around

While the frontal stand is in the left or right parked position, the LARC offers full body coverage in both AP and lateral projections

Technical information - User Interface

Xper User Interface in the examination room

Xper stands for X-Ray Personalized, and reflects the expert nature of the Allura Xper FD10/10 system. The three components of Xper are:
• Xper settings, which customize the system to each cardiologist's preferred settings
• Xper User Interface, which is based on Philips Vequion design principles
• Xper Integration, which includes highly advanced integration functionality, such as MultiSwitch, and Xper Window Switching

In the examination room, the Xper User Interface comprises the On-Screen Display, the Xper Module, and the Xper Imaging and Geometry Modules.

The On-Screen Display is positioned on the left side of the reference monitor. The following system information is displayed:
• X-ray indicator
• X-ray tube temperature
• Gantry position during rotation and angulation
• Source Image Distance for each channel
• Table height
• Tabletop tilt and cradle angle, if the table tilt/cradle option is installed
• Detector field size display for each channel
• General system messages
• Selected frame speed
• Fluoroscopy mode
• Integrated fluoroscopy time
• Air Kerma: dose rate during X-ray, accumulated dose with no X-ray
• Dose Area Product: dose rate during X-ray, accumulated dose with no X-ray
• Graphical bars for Body Zone specific dose rate and accumulated Air Kerma levels, in relation to the 2 Gy threshold
• Stopwatch

The On-Screen Display on the live monitor in the examination room contains the Xper ViewPad, which stores the pre-programmed function settings. The Xper ViewPad controls the following:
• Run and image selection
• Exam and run cycle
• Review speed
• Run and exam overview
• Active exam selection
• Flagging exam and run for storage
• Subtraction and image mask selection if subtraction option package is available
• Digital zoom
• Storing reference run or image to reference monitors
• Switching to the On-Screen Displays

cursor control

Xper Module

Xper Module

The Xper Module can be positioned both at the tableside and in the control room. Up to three Xper Modules can be connected to the system. The Xper Module contains the following functionality:
• Acquisition settings
  Settings for frame rates and X-ray generation that apply to the type of intervention. These are programmed in the Xper settings. This is also where the specific Xper setting for the StentBoost / Allura 3D-CA / Allura 3D-RA / Xper IM options can be programmed. If the option(s) is/are available on your system, this setting sends the acquired images directly to the interventional workstation for reconstruction.

Technical information - User Interface

• Automatic Position Control (APC), optional
• Image Processing
  Image Processing parameters, like contrast, brightness, edge enhancement and image invert can be adjusted.
• Quantitative Analysis (QA), optional
  If QA packages are available on the system, the analysis can be performed on the Xper Module. The package may contain Quantitative Coronary Analysis, Left and Right Ventricular Analysis.
• StentBoost on Xper module, optional
  Allows operation of StentBoost via the Xper Module in the examination room during the examination.
• Allura 3D-RA on Xper Module, optional
  Allows operation of Allura 3D-RA via the Xper Module in the examination room during the examination.
• Allura 3D-CA on Xper Module, optional
  Allows operation of Allura 3D-CA via the Xper Module in the examination room during the examination.
• Xcelera on Xper Module, optional
  Integrates the Xcelera network application in the Allura Xper system. It allows operation of the Xcelera Viewer with the Xper Module in the examination room during the examination.
• Hemo on Xper Module
  Integrates Xper IM Physiomonitoring in the Allura Xper system. It allows the physician and staff to perform a complete hemodynamic study tableside via the Xper Module. The "Hemo" menu contains the following subset of Xper IM physiomonitoring features:
  - SNAP (Auto record)
  - Obtain/Capture and store hemodynamic waveforms and ECG's
  - Cardiac output measurements
  - Monitor scale and sweep speed
  - NIBP measurement

Xper Biplane Geometry Module

Xper Geometry Module

The Xper Geometry Module can be positioned on all sides of the patient table. The module automatically adjusts to the selected position and retains the intuitive button operation. The Xper Geometry Module provides the following functionality:
• Tabletop float
• Table height position
• Table tilt angle (if table tilt option is provided)
• Table cradle (if table tilt + cradle option is provided)
  - Source Image Distance (SID)
• Stand positioning per plane
• Biplane rotation
• Store and recall of two stand positions, including SID
• Emergency stop button
• Accept button of the Automatic Positioning Control.
  - Geometry reset button, which resets stand and table to a default starting position

Xper Biplane Imaging Module

Xper Imaging Module

The Xper Imaging Module can also be positioned at all sides of the patient table, while retaining intuitive button operation. The Xper Imaging Module provides the following functionality:
• Fluoroscopy mode selection as defined via Xper settings
• Shutters and wedge positioning per plane
• For each plane, manual or automatic wedge operation, including positioning of the displayed image without radiation
• Xper fluoro storage to record the last ten or twenty seconds of fluoroscopy (free configurable length)
• Fluoro Grab to store the last fluoro image
• Shutter setting per plane
• Selection of the detector field size per plane
• Reset of the fluoroscopy buzzer
• Real-time subtraction and fluoro trace subtract, if the subtraction package is provided
• Toggle button to select the required channel for adjustments

Both Xper Modules have a removable protection bar that prevents unintended activation of the system.

Xper User Interface in the control room

In the control room, the Xper User Interface includes an Xper Review Module, two LCD monitors, the keyboard, a mouse, and monitor pedestal to align the monitor heights. The monitors have shared screens: the left color screen is the data monitor, and the black and white screen is the review monitor.

Xper Review Module

The Xper Review Module is a review station for basic cardiovascular viewing needs. The most prominent functions can be controlled by the touch of a button. The Xper Review Module comprises the following functionality:
• Power on/off of the system
• Tagarno wheel to control the review of a patient exam
• Exam and run cycle
• Adjustment of contrast, brightness, and edge enhancement
• Exam, run, and image stepping
• Run and exam overview
• Delete run
• Basic review functionality, like image invert and digital zoom
• Go to basic settings
• Reset fluoroscopy timer and switch X-ray on/off

Xper Review Module

Technical information - User Interface

Xper data monitor

Xper data monitor

The Xper data monitor is a **19**-inch LCD color monitor.
It shares a screen with the Xper review monitor.
A standard keyboard and mouse control the user interface.
The data monitor is intended as the patient data interface.
The workflow is divided into scheduling, preparation,
acquisition, reviewing, reporting, and archiving. System
information is displayed on the bottom of the data monitor:
• Stopwatch and time
• System guidance information
• Dose Area Product (DAP) and Air Kerma: dose rate
  during X-ray and cumulative dose with no X-ray per plane
• Frame speed settings, fluoroscopy mode, and
  accumulated fluoroscopy time per plane
• Exposure and fluoroscopy settings as Voltage (kV),
  current (mA) and time (ms) per plane
• Geometry information, including rotation, angulation,
  and SID per plane

Scheduling
On the scheduling page, new patient data can be added
manually or loaded from the CIS or HIS via DICOM Work
List Management (DICOM WLM). Patients can be listed
and selected per day, physician, or type of intervention.

Patient management protocols are exceptionally flexible
and allow multiple exams to be selected under one
patient identification number, so that new exams can be

appended to an earlier patient file. Furthermore, each
patient folder can contain multiple examinations to
accommodate split billing and split administrative
purposes. Each examination contains multiple files, such
as acquisition, reference, and QA files. Patient information
can also be sent from the modality to the information
systems with DICOM Modality Performance Procedure
Step (DICOM MPPS).

Preparation
The preparation page provides the room and patient
preparation preferences of each individual physician,
eliminating the need for hard copy protocols.
Physicians' preferences are programmed in the Xper
settings and the information resides permanently in the
system unless a change is made.

Acquisition
The acquisition page contains information on the current
selected patient. The page shows a full overview of all
acquired runs and allows you to do QA. The history file
of the patient can be reviewed at the touch of a button.

Review
The review page lets you review the following
information from patients:
• Previous exams
• Exams from other imaging modalities

Report
For systems with the Lab Reporting option, the report
page lets you create a patient report. The report
contains information on patient X-ray dose, written text
from the intervention, and appended clinical images. It
can be printed or sent out by electronic mail.

Archive
Clinical studies can be transferred to an optional Xcelera
DICOM Recorder (IDR) or to a PACS, like the Xcelera
PACS. The archive process - including multiple
destinations, archive formats, and background transfer
(optional) - can be completely automated and
customized with Xper settings.

Technical information - User Interface options

Xper review monitor

The review monitor is an 18-inch black and white LCD monitor that is shared with the color data monitor.

Xper review monitor

The Graphical User Interface on the black and white monitor has the following features:
• Step through exam, run, or images
• Exam and run overview
• Image processing features, such as contrast, brightness, and edge enhancement
• Flagging runs or images for transfer
• Exam annotation
• Automatic printing
• Quantitative Analysis Packages, if available
• Subtraction functionality, if available

Second Xper Biplane Imaging Module

Extension of the imaging controls in the control room with a second module in a master-slave configuration.

Second Xper Biplane Geometry Module

Extension of the geometry controls in the control room with a second module in a master-slave configuration.

Second or third Xper Module

Additional Xper Modules can be connected in the control room or in the examination room at tableside. Up to two Xper Modules can be connected in the control room, but only one Xper Module can be connected in the examination room.

The specifications and information on the Xper Module are similar for all Xper Modules connected to the system. If more than one Xper Module is connected to the system, each Xper Module can be operated independently.

Product Security

McAfee Virus-Scan software has been validated for use with our CV products. Please refer to Philips' service and security documentation for specific product details regarding McAfee usage and installation.

Philips offers:
• Online security resources to address your privacy, security, and regulatory concerns
• Access to security professionals who can assist with your IT department's compliance efforts and risk assessment
• Vulnerability monitoring and 24x7 incident response to help ensure that cyber security threats to medical devices and systems do not interfere with patient care

Technical information - Integration

The Xper DICOM Image Interface enables the export of clinical images to a destination like a CD-Medical station or a PACS server. The export formats are based on DICOM 3.0 protocols. The system exports clinical studies in Cardiac DICOM XA Multi-Frame or DICOM Secondary Capture formats:
- The Xper DICOM Image Interface transfers through its fast ethernet link, making images available on-line within seconds. The archiving process can be configured in the Xper settings
- The images are sent out, either in the background or manually, upon completion of the examination
- The export format can be configured to a 512x512 or 1024x1024 matrix, at 8- or 10 bit resolution
- The examination can be sent to multiple destinations for archiving and reviewing purposes
- The Xper DICOM Imaging Interface provides DICOM Storage and DICOM Storage Commitment Services. The DICOM Query/Retrieve function allows older DICOM XA MF and DICOM SC studies to be uploaded to the system. Additional information can be appended to a study without changing the patient identification

Storage capacity
The Allura Xper FD 10/10 has a standard storage capacity of approximately 100 cardiac examinations, which can store up to 100,000 images in a 1024^2 10-bit matrix.

MultiSwitch, option
MultiSwitch enables the Xper workspot in the control room to be shared with other applications that are loaded on separate PC modalities. The MultiSwitch enables you to switch to the color LCD data monitor, keyboard and mouse that are normally connected to the Allura Xper system. This saves significant space in the control room by enabling only one monitor and keyboard to be used for multiple applications, like StentBoost, Allura 3D- RA, Allura 3D-CA, Xcelera, Xper IM and ViewForum.

MultiSwitch includes Window Switch functionality. Xper Window Switch is a web based-browser (HTML) or X-window (Exceed) application that allows the Xper Viewing Console to be switched to Radiology/Cardiology Information Systems. The Xper Window Switch option makes full use of the available RIS/CIS facilities and existing support for automatic handling of logistic tasks (e.g., automatic tracking, purchasing supplies, and billing).

Lab Reporting, option
This option allows the clinical user to generate and print a report in modality stand-alone situations. The user can incorporate free text, clinical images, and X-ray dose information. The report is sent out via Dicom MPPS and contains:
- Total Fluoroscopy Time in minutes
- Radiation dose
- Total number of Exposures in numbers
- Accumulated Fluoroscopy Dose in mGy
- Accumulated Exposure Dose in mGy
- Total Dose in mGy
- Total Number of Frames in numbers
- Image Area Dose Product in mGy
- Entrance dose and Air Kerma in mGy

Detailed exposure information:
- Number of Exposure Results
- Exposure-related information, including Exposure Channel, Exposure Start Time, KVP, Distance Source to Detector (SID), Exposure Time, X-ray Tube Current, Positioner Primary Angle, Positioner Secondary Angle, and Frame Rate

Part of the report is generated automatically from administrative data (e.g., patient/exam data, hospital name), and acquired data (e.g., run-log and event-log).

Technical information - Image Detection

The Allura Xper FD10/10 is equipped with the latest generation dynamic flat detector, whose compact size can easily handle complex projections. Image quality and X-ray dose reduction are further enhanced by Xres techniques.

Dynamic Flat Detector

Philips' next generation dynamic flat detector provides excellent quality at a low patient X-ray dose.

Specifications for each plane:
- Size of detector housing, including BodyGuard: 37 cm (14 in.) diagonal
- Field Of View: 25 cm (10 in.), diagional square
- Detector zoom fields: 19 and 15 cm (8 and 6 in.) diagonal square format
- Pixel size: 184 x 184 microns to allow visualization of the smallest details
- Detective Quantum Efficiency DQE(0): 75%
- Output digital video frame: 1024^2 at 14-bit depth resolution
- Acquisition speeds can not be customized per system: 3.75, 7.5, 15 and 30 frames/second
- Digital video frame out for archiving purposes is customizable via Xper settings in different formats: 1024^2, 512^2, and 8 or 10 bit

Xres

Xres is a real-time image processing algorithm originally developed by Philips Research. Xres exploits the benefits of the fully digital detector to reduce noise in clinical images. It uses spatial filtering and does not compromise in image quality. Xres provides excellent visualization of coronary arteries in complex projections by harmonizing the background image. Plus, it improves the visualization of the region of interest. For example, it visualizes the fine details in the coronary arteries in situations where the arteries are projected over the diaphragm or spine.

Specifications:
- Real-time processing for X-ray fluoro and exposure speeds of up to 30 fps
- Xres can be customized for different image profiles via Xper settings. This customization allows each clinical user to choose their preferred image quality

Fluoroscopy

Three fluoro modes are available at tableside and these can be programmed via Xper settings. Each mode can be programmed with a different composition of X-ray dose rate, digital processing, and filter settings.

Specifications:
- Fluoroscopy image processing: recursive filtering, localized contrast-adaptive contour enhancement and Xres algorithm
- Pulsed X-ray modes with a Fast Fluoro Reset function, which quickly returns the system to fluoroscopy if there is an unexpected system reset
- Pulse rates: system-customized at 3.75, 7.5, 15 and 30 pulses per second
- Choice of Last Image Hold during fluoroscopy or a loop of the last fluoroscopy run (service configurable time)
- Frame grabbing of static fluoroscopy images or Xper fluoro storage to store the fluoroscopy run (service configurable time) for reference or archiving

Subtraction package

The Digital Subtraction Angiography (DSA) option extends the vascular applicational functionality of the Allura Xper system. DSA features real-time digital subtraction at low frame speeds of 0.5, 1, 2, 3, or 6 frames per second. The DSA programs can be selected via the Xper settings.

This option's exposure technique provides exceptional image quality for Subtracted images. It also offers run-subtract to perform subtraction per run.
This feature can be applied in the Rotational Scan and Bolus Chase Subtract options. DSA includes the following functionality: Fluoro-Trace, Fluoro-Subtract, Exposure Subtract on individual images or runs, mask selection, landmarking, and pixel shift.

Technical information - X-ray Generation

X-ray generation consists of the following elements: X-ray generator, X-ray tube, collimator (including SpectraBeam beam filtration), and dose protection mechanism. The complete dose protection mechanism is part of the DoseWise program.

Velara X-ray generator

The Velara generator is optimized for the latest cardiovascular needs.

Specifications for each plane:

- Microprocessor-controlled, 100 kW high-frequency converter generator
- Quartz-controlled IGBT-power-switch, with a minimum switching time of 1 ms
- Voltage range: 40 to 125 kV
- Maximum current: 1250 mA at 80 kV
- Maximum continuous power: 2.5 kW for 0.5 hours, 2kW for 0.8 hours
- Nominal power (highest electrical power): 100 kW (1000 mA at 100 kV)

The Xper settings for X-ray generation control can be selected on the Xper Module.

Xper Beam Shaping

Xper Beam Shaping provides virtual collimation of the shutters and wedges on the last X-ray image, eliminating additional X-ray dose during collimation changes.

X-ray tube

The Allura Xper FD10/10 features the legendary high power MRC-GS 0508 X-ray tube. In the last seven years, Philips has installed more than 5000 MRC X-ray tubes with customers around the world. Data shows that on average, the MRC X-ray tube lasts significantly longer than conventional tubes.

MRC-GS 0508X-ray tube

MRC-GS 0508

The powerful MRC-GS 0508 X-ray tube allows very high heat dissipation, enabling SpectraBeam filtration to reduce patient dose significantly.

Specifications:

- 0.5/0.8 nominal focal spot values with maximum loadability of 45 kW and 85 kW
- Grid Switching with pulsed fluoroscopy
- Anode heat dissipation in continuous mode: 3200 W
- Fluoro power for 10 minutes: 4500 W
- Fluoro power for 20 minutes: 3500 W
- Maximum heat dissipation of assembly: 3500 W
- SpectraBeam dose management
- Oil-cooled X-ray tube with thermal safety switch

SpectraBeam

SpectraBeam minimizes soft radiation with unique beam filtration

The combination of SpectraBeam with the MRC-GS 0508 tube allows increased X-ray output with better filtration of soft radiation. This reduces patient X-ray dose for cardio and vascular applications, while maintaining the same excellent image quality.

Specifications:

- Copper filters: 0.2, 0.5, and 1.0 mm copper equivalent. The filters can be programmed via Xper settings and the fluoroscopy mode can be selected at tableside

Technical information - Viewing

The system is delivered standard with four black and white 18-inch LCD monitors in the examination room. One 19-inch LCD color monitor and two 18-inch black and white LCD monitors are standard in the control room.

Specifications of color LCD monitor:
- 19-inch color LCD display
- Native format: 1280 x 1024 SXGA
- Wide viewing angle: approximately 170°
- Controlled brightness: typically 270 Cd/ m², with ambient light dependent brightness control
- On-screen display of control functions operated via push buttons
  - Audio output 0.5 Watt
  - Contrast typically 800 on 1

Specifications of monochrome LCD monitor:
- 18-inch monochrome LCD display with a native format of 1280 x 1024 SXGA
- 10 bit grey-scale resolution with grey-scale correction
- Wide viewing angle: approximately 160°
- High brightness: maximum 600 Cd/ m², with ambient light dependent brightness control
- On-screen display of control functions operated via push buttons
- Examination room LCD monitors include protection screen and motorized height adjustment

LCD monitors in the control room

LCD monitors in the examination room

Delivering clinical excellence with Philips CUSTOMerCARE service agreements

Philips **CUSTOMerCARE** service agreements deliver the flexibility and choice for you to succesfully manage your business. We offer customized solutions that enhance the quality of your care, increase your productivity, and improve your financial performance.

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Technical information - Options

MultiVision

The MultiVision video switch is the integrated video switch for high quality, progressive display video sources. It can switch either black and white or color signals, and supports up to four inputs to one output. MultiVision enables an extra color monitor in the ceiling suspension in the examination room to be shared between the system and other sources, such as a DICOM viewer, an Ultrasound system, StentBoost, a Allura 3D-RA or Allura 3D-CA interventional tool, etc. The switch is controlled via the acquisition manual on the Xper Module.

Physio Viewing

Physio Viewing provides acquisition, storage and display of physiological signals on the Allura Xper FD10/10 system. Four physiological data signals can be acquired and stored. One signal of choice can be displayed when reviewing images.

Continuous autopush

The continuous autopush option provides additional processor boards that are dedicated to archiving to minimize interruptions caused by other functions that require the image processor, such as patient review. Using this option speeds up archiving and the availability of clinical images for reviewing at other PACS destinations.

DICOM Print

DICOM Print provides an interface to any DICOM Printer. It provides Print Preview, Print Manual Overrides, Print Job submission, and Print Job management via automated printing protocols.

Intercom

Remote Intercom is used for communication between the examination and control room.

RIS/CIS DICOM Interface

This interface option enables two-way communication between the system, a local Information System (CIS or RIS), or hemodynamic system. The interface uses the DICOM Worklist Management (DICOM WLM) and Modality Performed Procedure Step (DICOM MPPS) standards. If a hospital has an information system, it is possible to receive patient and examination (request) information and to report the examination results. This option provides the following benefits:
• Eliminates the need to retype patient information on the system
• Prevents errors in typing patient name or registration number, which ensures consistency of information throughout the department to prevent problems in archive clusters
• Provides information to and from the information system about the acquired images and radiation dose

Upon request from the system, the complete worklist with all relevant patient and examination data is returned to the system.

Biplane standard line rate video input/output

The standard line rate video output is 625 (525) lines for a 50 (60) Hz video interface board. This option is required to connect standard line rate video peripherals for each plane, such as a VCR and/or video printer. The interface provides control for automatic biplane recording of fluoro and exposures with a VCR medical DVD recorder, and for replay of VCR or DVD images (on any SLR video source) on the system monitors.

Real-time digital link

The real-time digital link is a dedicated image link to an interventional tool, such as Allura 3D-RA, StentBoost, and/or Allura 3D-CA. This dedicated digital link sends raw or processed image data (depending on the application) in real-time during exposures to the connected interventional tool. This provides instant results of the applicable reconstruction after the exposure run.

Left Ventricular Quantification software package

Coronary Quantification software package

Quantitative Analysis Packages

Biplane left Ventricular Quantification software package

This software package enables the assessment of ejection fraction and left ventricular volumes. It combines the single plane and the biplane left ventricular software: the calculations can be executed from single plane or biplane projections.

Ventricular Quantification software package
The functions are:
• Various Left Ventricular volumes
• Ejection Fraction
• Cardiac output
• Centerline Wall Motion
• Slager Wall Motion
• Regional Wall Motion
• Calibration routines
  -Biplane Ejection Fraction automatic
  -Biplane Ejection Fraction manual

Right Ventricular Quantification software package

This software package is used to assess ejection fraction and right ventricular volumes. It enables you to perform right ventricular analysis from angiograms. The calculations can be executed from single plane or biplane projections. The package is intended especially for pediatric cardio applications and focuses on easy and efficient wall contour detection. It includes the following functions:
• Calibration routines
• Various Right Ventricular volumes
• Ejection Fraction
• Cardiac output
• Centerline Wall Motion

• Slager Wall Motion
• Regional Wall Motion
• Biplane Ejection Fraction automatic
• Biplane Ejection Fraction manual

Coronary Quantification software package

This software package provides quantification of stenosis measurements in the coronary arteries. It includes the following functions:

• Diameter measurement along the selected segment
• Cross sectional area
• Percentage of stenosis
• Stenotic flow reserve
• Pressure gradient values
• Calibration routines

Vascular Quantification software package

This is a clinically validated analytical software package for quantitative analysis. It includes the following functions:
• Vessel diameter and stenotic index
• Automated Vessel Analysis
• Calibration routines

Autocall

The Autocall option can be used in conjunction with the Quantitative Analysis packages. When an object to be analyzed, like the left ventricle or vessel segment is placed in the isocenter, full autocall eliminates the need to:
• Acquire an additional image series containing a sphere or grid for calibration purposes
• Calibrate manually on a calibration object, like a catheter that is displayed in the image or image series to be analyzed

Image after StentBoost

Allura 3D-CA

Allura 3D-RA

Examination light

StentBoost

StentBoost is a simple, quick, and cost-effective tool to enhance visualization of stents in the coronary arteries. It shows the stent in relation to the vessel wall. StentBoost uses markers on the balloon or stent delivery catheter to better visualize objects in the direct environment of the markers. It improves:
• Stent positioning in lesions and bifurcations
• Stent deployment
• Stent-in-stent placement
• Assessment of stent artifacts (like fractures)
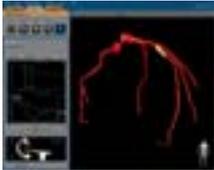
Allura 3D-CA

Allura 3D-CA creates a 3D model of 2D coronary artery images. It can help improve diagnosis by providing:
• Optimal insight into the structure of the coronary tree
• Improved assessment of lesions and bifurcations
• Insight into the optimal working angles

Enhance interventional preparation:
• Select the right stent length
• Select optimal view of lesion or bifurcation with "TrueView" map

Enhance interventional execution:
• Work with optimal viewing angles of lesions and/or bifurcations
• Place the right stent with the right length in the right place

Via the real-time link and seamless integration with the Allura Xper FD10/10, the interventional tools work perfectly in sync with the system.

CT TrueView

CT TrueView connects the Cath lab to the CT room. It provides all the benefits of Allura 3D-CA based on a CT diagnostic image. It offers:
• Optimal C-arc positioning on Philips CT data sets to minimize foreshortening when assessing lesions or bifurcations

• Full integration with Philips products. This option is available in the extended Brilliance workspot in the CT Room and it can be controlled from tableside or from the control room in the Cath Lab. It is one easy to use user interface on the EBW and interventional hardware

Allura 3D-RA

The Allura 3D-RA interventional tool provides extensive three-dimensional insight into vascular pathologies from a single Rotational Scan acquisition. It allows:
• Development of better treatment strategies using superb images
• Selection of the best stand projections for treatment
• Treatment progress to be monitored in 3D: visualization of deployment of embolization material
• Reduction of exam time, X-ray dose, and contrast medium by eliminating the need for multiple DSA/ fluoro exposures

EP navigator

EP navigator shows the catheter and the 3D anatomy in real-time in one image, allowing electrophysiologists to instantly confirm the position of any catheter or lead with respect to detailed 3D cardiac anatomy in the EP intervention lab. This information can support the electrophysiologist in performing complex EP procedures with greater confidence, in a more intuitive way. During the procedure, EP navigator helps the electrophysiologist:
• Guide mapping procedures with more confidence
• Get to ablation points that are difficult to reach more confidently
• Perform complex procedures when you don't have access to mapping

Examination Light

This light enables the optimal visualization of the region of interest under daylight conditions. The light's intensity is 30,000 Lux. The handgrip is removable and can be sterilized for use with a disposable cover.

Accessories

- Peripheral X-ray filter
- Cath arm support (adjustable)
- Ratchet compressor
- Table X-ray protection
- Pulse cath arm support
- Pan handle
- Ceiling-suspended radiation shield
- MCS bracket ceiling Radiation Shield
- Examination light
- Drip stand
- Arm support
- Mattress
- Neuro Mattress
- Set of arm supports
- Table clamp
- Patient straps
- Head support
- Set hand grips & clamps
- Cerebral filter
- Neuro wedge
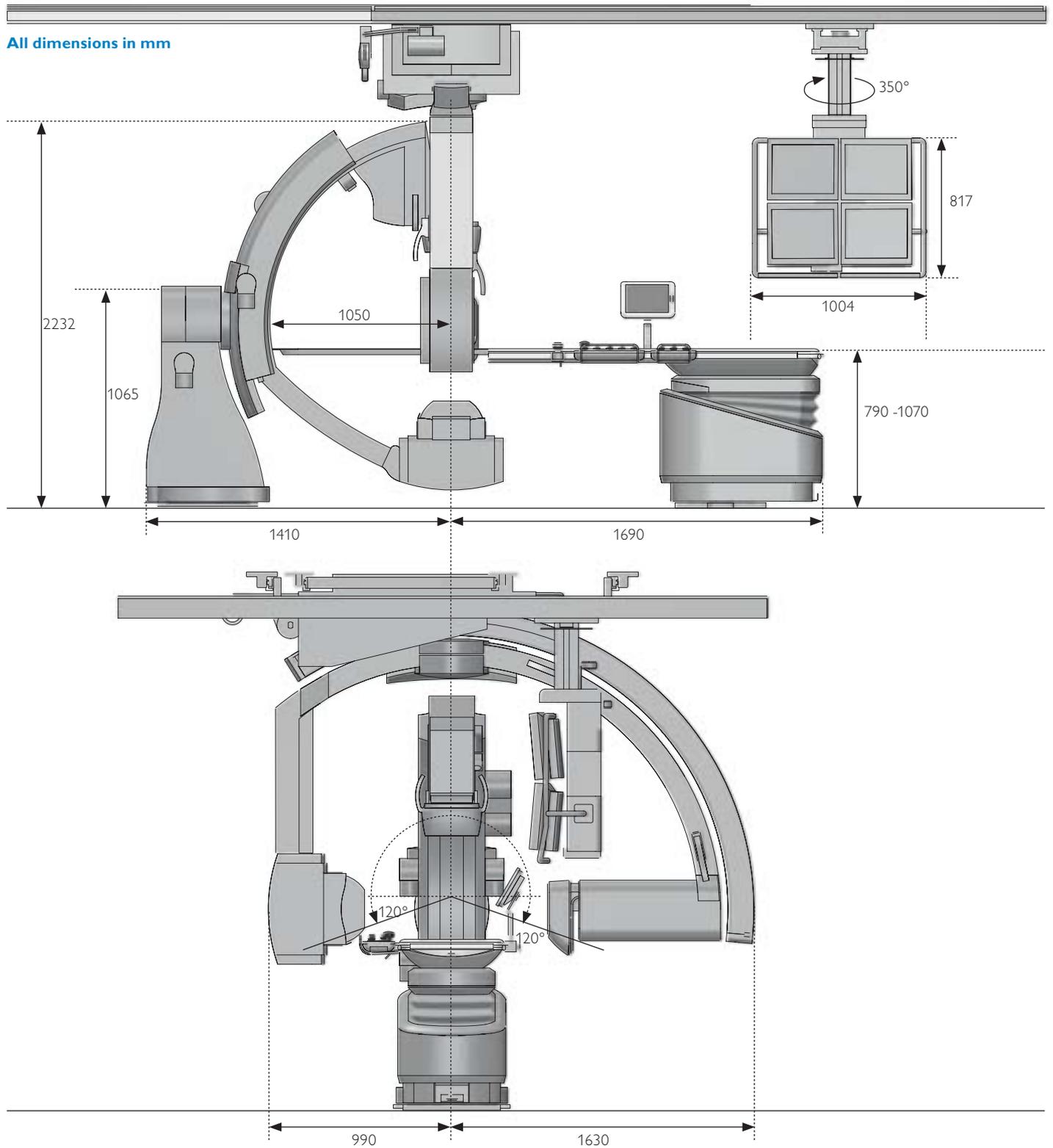- Cable holders (15 pieces)

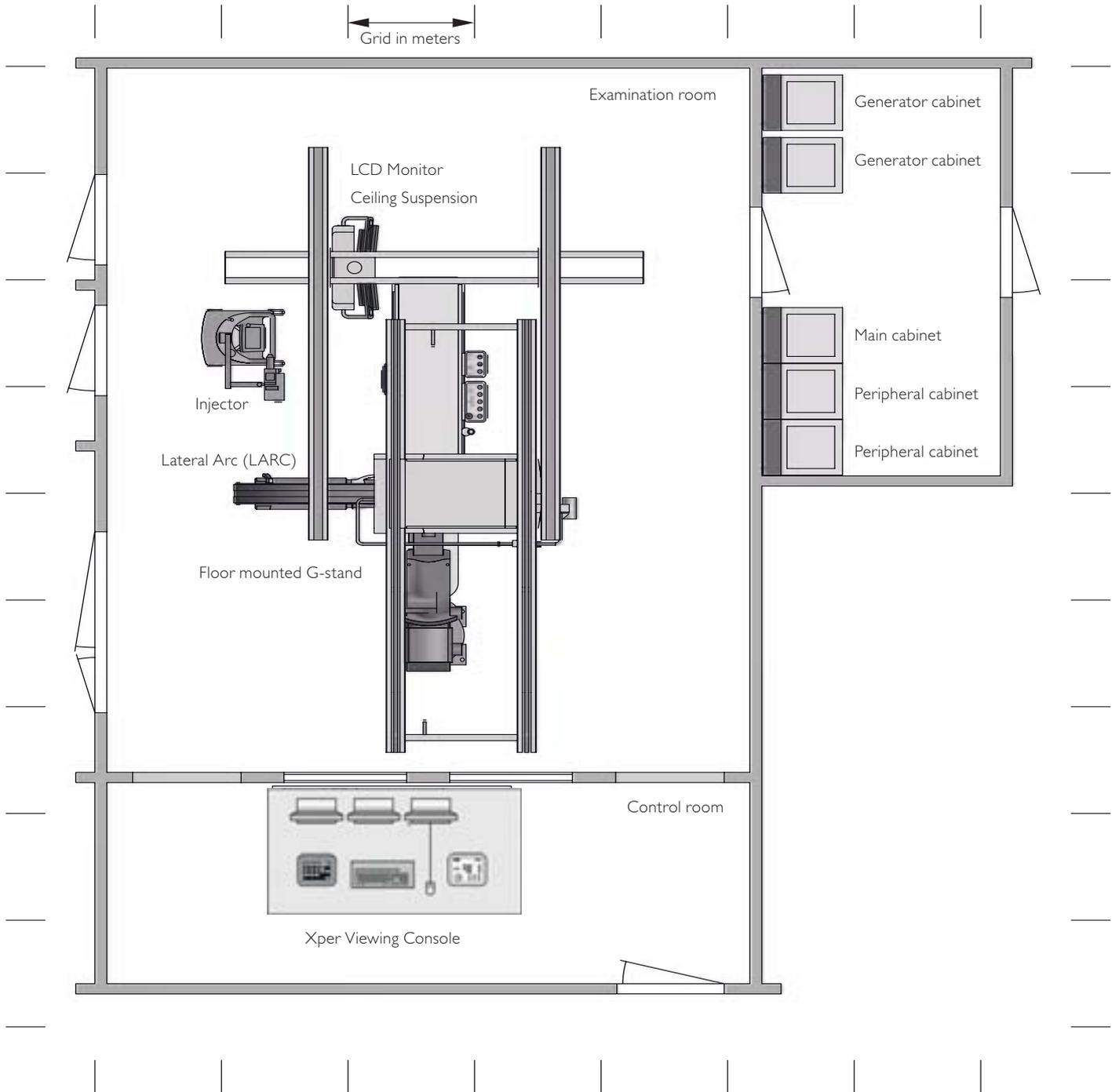Patient straps

Head support

Arm support

Pulse cath arm support

Technical information - Dimensions

All dimensions in mm

350°

817

1004

2232

1065

1050

790 -1070

1410

1690

990

1630

120°

120°

Technical information - Room Layout

Grid in meters

Examination room

Generator cabinet

Generator cabinet

LCD Monitor

Ceiling Suspension

Main cabinet

Peripheral cabinet

Injector

Peripheral cabinet

Lateral Arc (LARC)

Floor mounted G-stand

Control room

Xper Viewing Console

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