Product Data

Elekta Harmony

The Perfect Balance.

Elekta Harmony is pending CE mark submission. Not intended for U.S. audiences. Not available in all markets.

About Elekta Harmony

As the role of radiation therapy in cancer grows, clinics need to offer fast, precise and versatile treatment options. While helping as many patients as possible is a priority, the need for human interaction in cancer care is not to be forgotten.

Elekta Harmony provides a balance between advanced technology and usability, helping you to focus on the treatment and the patients—not the system.

Unlock perfect productivity

Elekta Harmony is the most productive linear accelerator we ever made—balanced with the best in-room experience

- FastTrack technology offers a reduction in setup time by 50%* and allows you to stay by your patient's side
- Ability to treat most common indications in less than 10 minute treatment slots with single arc, single isocenter, single plan
- Provides fast and integrated machine QA that automates and simplifies QA tests

More than a linac

Maximize your investment with Harmony solutions covering everything from startup throughout the lifetime of your system

- Efficient Go Live with our Harmony START program
- Optimized support for reliable and predictive service throughout the lifetime of your linac
- Match your linac fleet to maximize efficiency across the entire department
- With smart dashboards you can access, monitor and understand your data wherever you are

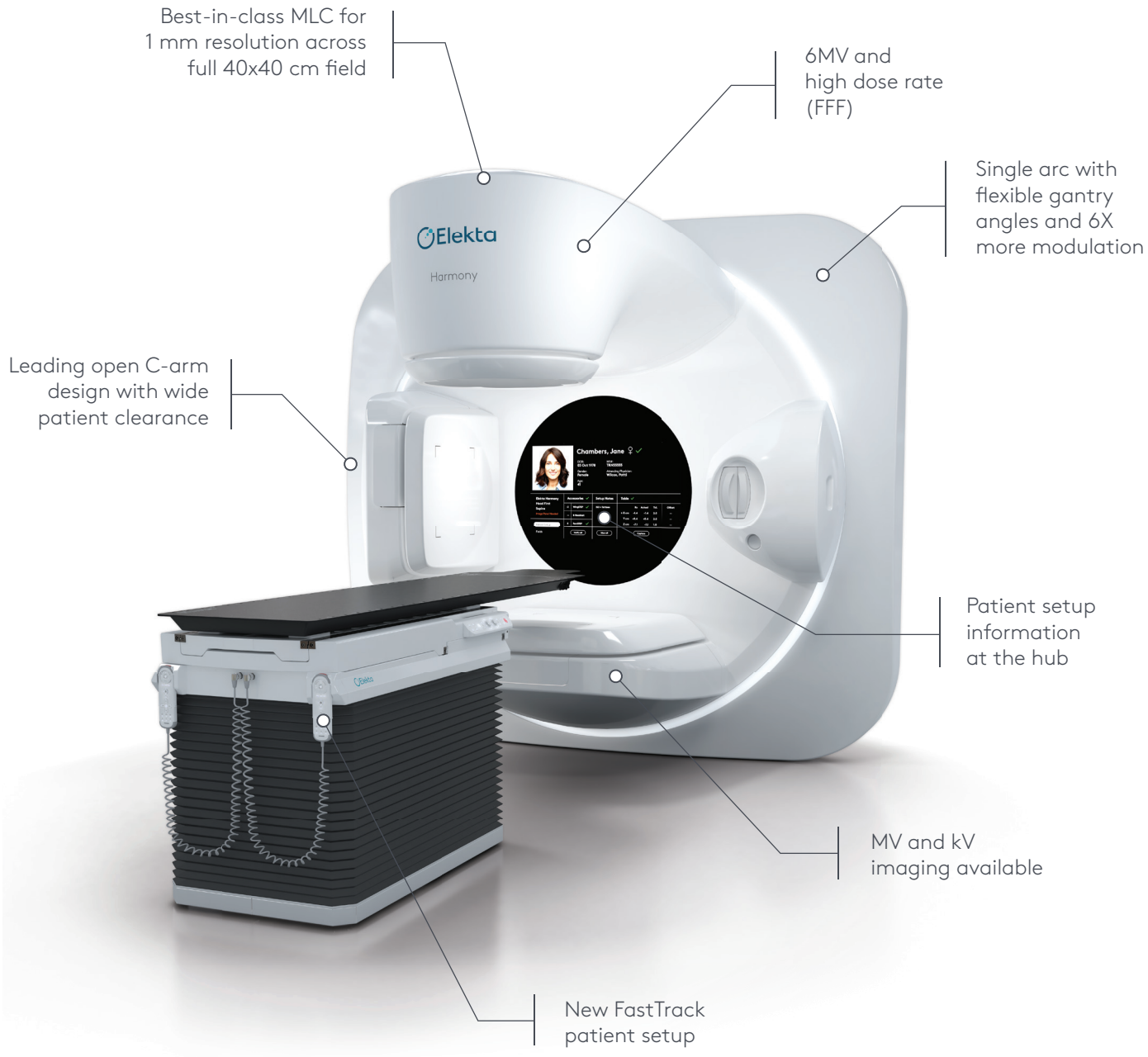
Elevate precision with versatility

Elekta Harmony brings precision as standard and ensures that you have the versatility you need to treat any patient that comes through your door

- Excellent dose conformity with 1 mm resolution across full 40 cm x 40 cm dynamic field size
- High dose rate mode (FFF) offers the confidence and flexibility to deliver a wide variety of dynamic and advanced treatment techniques
- Advanced image-guided radiation therapy (IGRT) with choice of 2D and 3D imaging

*Elekta maintains internal data

System overview



Beam overview

X-ray beams (excluding High Dose Rate Mode)

Harmony includes 6MV x-ray energy.

Beam quality

Nominal energy, MV	6
D_{max} cm (cm)[1]	1.5
D_{80}, ±0.3 cm (cm)[2]	6.4
D_{10}, ±1% (%)[3]	67.5
Quality index, TPR20,10[4]	0.68
Minimum dose rate[5]	30
Maximum dose rate[5]	500

[1] Depth of maximum absorbed dose for a 10 cm x 10 cm field at SSD = 90 cm (Ref. IEC 60976)

[2] Depth of 80% of maximum absorbed dose for a 10 cm x 10 cm field at SSD = 90 cm (Ref. IEC 60976)

[3] Percent absorbed dose at the depth of 10 cm for a 10 cm x 10 cm field at SSD = 100 cm, relative to the maximum dose (Ref. BJR Supplement 25)

[4] The ratio of the absorbed doses at depths of 20 cm and 10 cm, measured with a constant SDD of 100 cm for a 10 cm x 10 cm field, at the plane of the detector (Ref. IAEA TSR 398, IEC 60976)

[5] Dose rate applies at Dmax for a 10 cm x 10 cm field at SSD = 100 cm—the dose rate units of MU/min are equivalent to cGy/min as the accelerator is typically calibrated to provide 1 cGy per MU

Uniformity of square x-ray fields

Uniformity is measured in the plane perpendicular to the beam axis, 100 cm from the target (SDD) and at the standard measurement depth of 10 cm with an SSD of 90 cm for 6MV and above. (Ref. IEC 60976)

	Percentage
Flatness (5 cm x 5 cm to 30 cm x 30 cm)[1]	≤ 106%
Flatness (> 30 cm x 30 cm)[1]	≤ 110%
Symmetry (> 5 cm x 5 cm)[2]	≤ 103%
Max ratio of absorbed dose (5 cm x 5 cm to 30 cm x 30 cm)[3]	≤ 107%
Max ratio of absorbed dose (> 30 cm x 30 cm to max square 35 cm x 35 cm)[3]	≤ 109%
Dose deviation of square fields with angular positions[4]	≤ 3%

[1] Field flatness—maximum ratio of the maximum absorbed dose to the minimum absorbed dose

[2] Symmetry—maximum ratio of absorbed doses at points symmetrically displaced from the axis of the beam and within the flattened area

[3] For all energies the maximum ratio of absorbed dose in the radiation field to absorbed dose on the radiation beam axis in the plane at the depth of dose maximum

[4] Maximum variation in the ratio of absorbed dose at any point in the flattened area to the absorbed dose on the radiation beam axis at the standard measurement depth for all angular positions of the gantry and beam limiting system

High Dose Rate Mode (FFF)

Developed to support the most advanced radiotherapy techniques, High Dose Rate Mode decreases time for beam delivery by removing the flattening filter and increasing the dose rate. This faster delivery can increase treatment accuracy by reducing the risk of intrafraction motion. The Speed package includes 6MV FFF, as shown below.

Beam quality

Nominal energy	6MV HDRM
D_{10}, ±1% (%)[1]	67.5
Minimum Dose Rate[2]	200
Maximum Dose Rate[2]	1400

[1] Percent absorbed dose at a depth of 10 cm for 10 cm x 10 cm field at SSD = 100 cm, relative to the maximum dose (Reference BJR Supplement 25)

Note: The 6MV High Dose Rate Mode beam has the same beam quality as the flattened 6MV

[2] Dose rate applies at Dmax in water for 10 cm x 10 cm field at SSD = 100 cm; the dose rate units of MU/min are equivalent to cGy/min as the accelerator is typically calibrated to provide 1 cGy per MU

Beam profile characteristics of square x-ray fields

The beam profile characteristics are measured in the plane perpendicular to the beam axis, 100 cm from the target (SDD) and at the standard measurement depth of 10 cm with an SSD of 90 cm for 6MV and above. (Ref IEC 60976)

	Measurement point distance from central axis as a percentage of the half field width	6MV FFF
Nominal Dose (%) for 30 cm x 30 cm, relative to the central axis	20%	94.8
	50%	79.4
	80%	64.2
	Absolute tolerance (± %)	3
Symmetry (≤ 5 cm x 5 cm)[1]		≤ 103%

[1] Symmetry—maximum ratio of absorbed doses at points symmetrically displaced from the axis of the beam and within the central field analysis area*

* Note: The central field analysis area is similar to the IEC flattened area except that the nominal (set) field is used instead of the 50% field edge

Mechanical performance specifications

Isocenter

	Distance (cm)
Target to isocenter	100 ±0.2 cm
Isocenter height above floor	124 cm
Horizontal distance from gantry fascia to isocenter	138.5 cm
Maximum displacement of the radiation beam axis from the isocenter	2 mm[1]
MV isocenter and kV imaging isocenter coincidence	≤ 1.0 mm

[1] As defined in IEC 60976/60977

Optical distance meter

The optical distance meter indicates the distance from target (source) to patient surface on the central axis.

Range	75 cm to 170 cm
Accuracy	±1 mm at 100 cm at gantry 0°
	±3 mm at 75 cm and 125 cm gantry 0°
Resolution	5 mm

Mechanical front pointer

The mechanical front pointer indicates the distance from target (source) to patient surface on the central axis.

Range	85 cm to 100 cm
Accuracy	2 mm at 100 cm
Resolution	5 mm

Rotation

	Gantry	Collimator
Range	365° (±182.5°)	365° (±182.5°)
Rotation speed (continuously adjustable)	0 to 1 rpm	0 to 2 rpm
Accuracy of angle indicators	Digital scale ±0.5°	
Resolution of angle indicators	Digital scale 0.1°	

Light field-indicator (field-defining light)

A light field is provided that defines the position of the radiation field in both x-ray and electron modes. Crosswires projected in the light field indicate the position of beam central axis. The integrated wedge filter orientation is also displayed.

Crosswire accuracy (walk-out) at isocenter[1]		≤ 1 mm
X-ray to light coincidence[2]	5 cm x 5 cm to 20 cm x 20 cm[1]	≤ 1 mm
	greater than 20 cm x 20 cm[1]	1% of field size

[1] Radiation field is defined as the distance between the 50% dose points on the major axis of the field in the plane of the isocenter (SDD = 100 cm) with 10 cm of build-up (only for flattened beams)

[2] Maximum distance along the major axes between the light field edge and the radiation field edge for centered fields at normal treatment distance

Anti-collision protection

The head of the digital accelerator and both imaging detectors are fitted with a positive action touch guard that protects against a collision between the detectors or radiation head with the patient on the table or any other object. If activated, the interlock chain will stop and inhibit any movements of the gantry, head, imaging arms and table. Temporary override action is available to allow removing the collision conditions.

The patient clearance aperture is 90 cm for imaging and treatment delivery.

Assisted Setup (ASU)

ASU moves the gantry, collimator, beam geometric parameters and table isocentric rotation to the positions specified in the field prescription. The user can configure the digital accelerator so that the ASU function operates remotely from the control room, from the handheld controllers and table control panels inside the treatment room.

Precision

- Angular positions < 0.5°
- Linear positions < 0.5 mm

Movement controls and display

All motorized movements can be operated simultaneously and at variable speed. Several scaling conventions are available for the customer to choose from (see previous section: mechanical parameters and indicators—position indicators scale conventions).

Handheld movement controllers
Two handheld movement controllers inside the treatment room allow selection of field size, rotation of gantry and radiation head and control of all motorized table movements. The handheld controller also controls the positioning lasers and room lights as well as paging of treatment/machine information displayed on the monitors inside the treatment room. The consolidated handheld controllers also gives the ability to switch between and control the imaging panels by a simple click of a button.

Table control panels
Two control panels on the sides of the patient table include controls for longitudinal and lateral movements, and vertical height adjustments. In addition most movements can be released for manual operation. Rotation about the table support column is manually controlled. The table control panels also control the distance meter, central field, positioning lasers and room lights as well table ASU.

Treatment setup workspace
The hub—a treatment setup workspace display at the center of the linac—provides all your patient and setup information required. The hub provides a simple, guided, follow me workflow that is easy-to-learn. The clear user interface displays information intuitively from left to right, making patient setup as smooth and fast as possible.

Treatment control system

Elekta's integrated digital control system controls and monitors Elekta's digital treatment system and MLC. Acting as guardian of treatment delivery and the cornerstone of digital efficiency, it provides the safety, confidence and flexibility to deliver a wide variety of treatment techniques.

Treatment delivery techniques

Harmony supports the following licensed treatment delivery techniques:

- **Static**—Square or irregular shaped beams delivered with a static gantry
- **Wedged**—Supports delivery of wedged fields using an automatic, integrated wedge with angles continuously variable in the range 0° to 60° (by combining an open field with a 60° wedged field)
- **Arc**—Gantry rotation during delivery with a fixed-field shape, constant gantry speed and dose rate
- **IMRT–Step and shoot**—This option enables the digital accelerator to deliver IMRT in segmental (Step-and-Shoot) mode; accurate and stable beam control ensures an accuracy of ≤ 1% or 0.1 MU (whichever is greater), which is vital during the sequential delivery of low dose IMRT fields
- **IMRT–Sliding window**—With the same excellent dose and geometric accuracy and functionalities as Segmental, this option enables continuous dynamic movement of diaphragms and MLC leaves during irradiation; support for popular techniques such as "sliding windows"
- **Dynamic Conformal Arc Therapy (DCAT)**—In this arc therapy, the linear accelerator delivers a constant number of MU per degree of movement; during delivery, simultaneous gantry rotation and motion of diaphragm and MLC leaves is permitted; dose rate and gantry speed can change along the arc and are automatically selected by the control system to achieve the prescribed dose/degree; multiple and continuous arcs in CW and CCW direction can be delivered
- **Volumetric Modulated Arc Therapy (VMAT)**—This license enables Elekta volumetric intensity modulated arc therapy (VMAT) treatment delivery; VMAT is capable of simultaneous dynamic control of MLC, diaphragms, gantry and collimator—it allows continuously variable MU per degree along the arc and, as in dynamic arc, the control system automatically adjusts all linear and angular speeds as well as dose rate; multiple and continuous arcs in CW and CCW direction can be delivered

Specification table for VMAT	
MU per step	Minimum 0.1 MU
MU per segment	Minimum 1.0 MU
Immediate creation of finish field	Yes, can be delivered immediately or at a later date
Rotation movements	Minimum 0.1 MU/degree
Linear movements	Minimum 0.3 MU/cm
Maximum jaw speed	3.5 cm/second
Bi-directional arcs	Yes
Multiple superimposing arcs	Yes

Gated delivery

Harmony supports the delivery of gated radiation treatments.

Gating Mode	Supported
Manual gating	Yes
Automated gating	Yes
Breath-hold gating	Yes
Free-breathing gating[1]	Yes
Exception gating	Yes

[1] Beam-on time ≥ 2 seconds

High resolution beam shaping

Our Harmony system has high-resolution beam shaping as standard. Built on a strong understanding of the factors that are critical to patient plant optimization and treatment delivery, Elekta Harmony is designed to meet the needs of modern radiotherapy treatments.

- Full 40 cm x 40 cm dynamic field size
- Fast leaf speed with 6.5 cm/s
- Low leakage and transmission
- Single isocenter deliveries for complex cases
- Interdigitation across the whole field
- Virtual 1 mm leaf width

Number of leaves	160
Minimum recommended field size (cm)	0.5 x 0.5
Maximum field size (cm)[1]	40 x 40
Nominal leaf width projection at isocenter (mm)	5
Maximum distance between leaves on same leaf guide (cm)	20
Leaf travel over central axis (cm)	15
Leaf nominal height (cm)	9
Diaphragm overtravel (cm)	12
Head to isocenter clearance (cm)	45
Head rotation speed for dynamic delivery techniques	6°/s maximum

[1] Fields larger than 35 cm x 35 cm are limited in the corners by a circle of 50 cm diameter (defined by the primary collimator)

Leaf positioning

The robust and reliable Rubicon optical positioning system provides real-time assurance of accurate leaf positioning. Ultraviolet light from an LED source produces infrared fluorescence when it falls on the ruby tips of the multileaf collimator leaves. This infrared fluorescence—detected by an infrared camera—is used to reliably monitor and accurately position the leaves.

Dimensions, weight, speed

Head weight	420 kg
Radiation head diameter	81.5 cm[1]
Leaf speed	Up to 3.5 cm/s combined with dynamic leaf guide up to 6.5 cm/s
Diaphragm speed	Up to 9 cm/s
Head rotation speed for setup	12°/s maximum

[1] Maximum swept diameter

Integrated wedge

Wedge angles	0–60°
Wedge field size	40 cm (X_{IEC}) x 30 cm (Y_{IEC})

Physics performance

X-ray to light coincidence[1]	1 mm for field sizes 5 cm x 5 cm to 20 cm x 20 cm	
	≤ 1% for field sizes 20 cm x 20 cm to maximum square	
Penumbra (80–20%) for centered fields (6 MV), measured at dmax	Flat beams	< 5.5 mm
	High Dose Rate Mode[2]	< 5.5 mm for field sizes 5 cm x 5 cm to 15 cm x 15 cm^2 < 6 mm for field sizes 15 cm x 15 cm to 35 cm x 35 cm^2
Leaf tip penumbra variation for 5 cm x 5 cm field over the full travel range	< 1 mm	
Leaf position accuracy[3]	1 mm at isocenter, 0.5 mm RMS	
Leaf position repeatability	< 0.5 mm	
Average transmission through leaves[4]	< 0.375%	
Peak transmission through leaves[4]	< 0.5%	
X-radiation leakage in patient plane outside primary collimator cone region[5]	< 0.2% max, <0.1% avg	
X-radiation leakage outside patient plane (at 1 m)[6]	< 0.5%	

[1] Maximum distance along the major axes between the light field edge and the radiation field edge for centered fields at normal treatment distance

[2] Due to the unflattened nature of the beam, a normalization of the profile is applied by dividing by the largest unflattened open field (40 cm x 40 cm)

[3] Measured using a stripe test. Maximum error quoted as maximum positional error in any leaf pair abutment and root mean square for any leaf pair across all abutments

[4] IEC 60601-2-1:2009+A1:2014, clauses 201.10.1.2.103.2.1a/e and 201.10.1.2.103.2.1b/e for peak and average leakage respectively

[5] IEC 60601-2-1:2009+A1:2014, clauses 201.10.1.2.103.3a and 201.10.1.2.103.3b for maximum and average leakage respectively

[6] IEC 60601-2-1:2009+A1:2014, clause 201.10.1.2.104.1a

Image guidance

For precise and accurate dose placement, imaging at the time of treatment is crucial. The ability to have positional information on the location of the target and critical structures gives confidence that the original plan objectives are being maintained.

As a pioneer in image guided radiotherapy (IGRT), Elekta provides multiple solutions that enable you to select the best solution for your patient.

- Largest single imaging field of view for kV imaging
- Optimized workflows for efficient, intuitive image guidance

MV IGRT

The MV imaging solution includes an amorphous silicon (a-Si) detector, combined with fully automated image acquisition. Multiple acquisition modes are available, including single-, double-, multiple- or movie-image exposures.

MV product performance

Retractable system

- Retractable to 27 cm
- Offset field 11.5 cm in any direction
- Fixed at 60 cm from isocenter

Weight

- Detector 22 kg
- Detector + arm 120 kg

Amorphous Silicon (a-Si) detector

- 410 mm x 410 mm
- Image matrix 1,024 x 1,024 x 16 bits
- Hardware enabled for 2.6 FPS
- Pixel size at isocenter: 0.25 mm
- Pixel size at detector: 0.4 mm

Field size

- Isocenter field size: 26 cm x 26 cm (long. x lat.) with head at 0°

Isocentric accuracy

- Stability 2 mm at isocenter

Spatial resolution

Quantitative measurements of MTF at 30% and 50% using the QC3 phantom (Standard Imaging PIPSPro), placed on the EPID, with 6MV flat beam:

Dose	MTF30		MTF50	
	Despeckle Filter OFF	Despeckle Filter ON	Despeckle Filter OFF	Despeckle Filter ON
1	0.7	0.6	0.4	0.35
3	0.7	0.6	0.4	0.35
100	0.7	0.7	0.3	0.35

MV image quality

Contrast-to-Noise Ratio (CNR)

Dose	Energy
	6MV
1	> 90
3	> 110
100	> 800

Measured with Standard Imaging QC3 phantom (PIPSPro)
Maximum frame averaging

kV IGRT

Elekta's kV solution (XVI) has been optimized for advanced image-guided radiation therapy (IGRT). Fast integrated imaging is driven through preconfigured preset protocols, which can be easily optimized by the user for particular imaging needs. Registration workflows effortlessly facilitate patient setup correction, ensuring confidence in dose placement.

Imaging acquisition and registration

PlanarView™ kV single exposure
A single kV image can be acquired—suitable for orthogonal or stereoscopic imaging.

MotionView™ kV sequence imaging
A sequence of images that enables the viewing of intrafraction motion while the patient is in the treatment position and is suitable for 2D anatomical motion studies.

VolumeView™ 3D IGRT
A 3D VolumeView is reconstructed from a series of 2D projection images. The number of projection images acquired can be varied within the preset functionality, depending on the image quality required and patient imaging dose that is considered appropriate for the anatomical region being imaged. This flexibility is provided by using full or partial gantry rotations, with the opportunity to select a choice of gantry rotation speeds.

Note: MV only option available.

Preset driven acquisition and reconstruction

For 3D volumetric imaging, flexibility of acquisition parameters is assured through the implementation of preset parameters that can be configured by the user within the software. These parameters include generator settings, required gantry sweep, appropriate field-of-view settings and collimated x-ray field. Fast inline reconstruction can be selected for maximum workflow efficiency; reconstruction takes place during image acquisition so the 3D image is available immediately following acquisition. The resolution of the reconstruction matrix used can be configured by the user. Presets are supplied for 0.5 mm, 0.75 mm, 1 mm and 2 mm voxels.

Registration workflows

VolumeView registration
Specific anatomy for registration can be selected by using a clipbox (cube) volume or a shaped region of interest. The shaped registration region of interest allows structures imported from the treatment planning system to be used for generation of the registration volume. The following optimized registration workflows are available for efficient, intuitive image guidance.

- Automated Bone Registration (based on chamfer matching)
- Grey Value Registration (automated soft tissue matching)
- Manual Registration

kV product performance

kV Imaging System

Peak power	40kw, iso spec
Radiographic kv range	70kVp–150kVp
Max mAs	500mAs
Voltage ripple	typical < 1% @ 100kvp
Rise time	typical 1 ms
Power input	3 phase

Fan-cooled x-ray tube

X-ray tube housing assembly total heat storage capacity	1200kHU
Cooling rates for anode and housing additional ventilator (HU/min)	705 HU/s
Added filtration	2.6 mm Al and 0.1 mm Cu
Duty factor	Nominally two VolumeView scans in 15 mins

Amorphous Silicon (a-Si) detector

- 410 mm x 410 mm
- Nominally 5.5 FPS
- Image matrix 1,024 x 1,024 x 16 bits

Field of view[1]

- Small: 27 cm x 26 cm
- Medium: 41 cm x 26 cm
- Large: 50 cm x 26 cm

[1] Field of view is determined as the visible reconstructed VolumeView image

2D system accuracy

2D System Accuracy[1]	< 1 mm

[1] The 2D system accuracy is determined by the difference between the XVI show center position on acquired 2D images on the MV radiation isocenter

2D PlanarView™ image quality

The 2D image quality has been determined using the Leeds TOR 18FG phantom with a 1-mm copper plate placed on top of the phantom. The parameters used for image acquisition are:

Parameter	Value
kV	120
mA	10
ms	25
Frames	15
Total mAs	3.75

Low contrast visibility[1]	< 2.7%
Spatial resolution[2]	> 1.4 lp/mm

[1] The Leeds test object contains contrast objects from 16% to 0.9%

[2] The Leeds test object contains spatial resolution blocks from 0.5 to 5.0 line pairs per mm

3D system accuracy

	RMS error	Max. error
Alignment of MV radiation field center to kV isocenter	0.7 mm	1 mm
Image registration (on XVI) auto-registration bony anatomy	0.5 mm[1]	1 mm[1]
Manual registration Note: this is testing alignment of kV imaging center to isocenter per axis	1 mm[2]	1 mm[2]
Manual table correction	1 mm[2]	2 mm[2]
Automatic table correction	0.5 mm	1 mm
Total clinical accuracy (image, bony anatomy registration, automatic table correction, treatment)	1 mm[3]	2 mm[3]

[1] Subject to planning CT quality and clinical site

[2] By typical operator

[3] Total clinical accuracy is the accuracy of a delivered 3D multifield dose distribution to an imaged target

3D image quality

The 3D image quality has been determined using the Phantom Laboratories CATPhan 503 Phantom with contrast resolution module, spatial resolution module and uniformity resolution module.

Example parameters used for image acquisition are:

Parameter	Value
kV	120
mA	40
Field of view	27 cm (small)
Number of projections	650
Gantry sweep (arc)	360 degrees
Reconstruction	inline
Slice thickness	1.5 mm

Low contrast visibility[1]	≤ 3.0%
Spatial resolution[2]	>10 lp/cm
Uniformity[3]	within ±1.5% across a 15 cm diameter region
Geometric accuracy[4]	–axial geometric accuracy[5] < 1 mm –sagittal geometric accuracy[5] < 1 mm

[1] The contrast resolution module contains 8 x 1.5 mm inserts (LDPE, polystyrene, air (x2), Teflon, Delrin, acrylic and PMP). Measurement taken using LDPE and polystyrene

[2] The spatial resolution module contains 21 spatial resolution sections measuring from 1 to 21 line pairs per cm

[3] The uniformity module contains a material within 2% (2HU) of water

[4] Geometric accuracy is the accuracy of distances measured in the reconstructed data against the physical dimension; measurements were made using the CATPhan 503 Phantom

[5] By typical operator

File sizes for reconstructed images

	Reconstructed image	Projection data[1]
VolumeView™ (half rotation scan, 360°/min)	20 MB	100 MB
VolumeView (full rotation scan, 180°/min)	35 MB	350 MB
Symmetry	41 MB	525 MB

[1] Projection images can be deleted following reconstruction

DICOM

View latest DICOM conformance statement at elekta.com.

Patient support system

The patient positioning system is designed for modern treatment techniques where a high degree of precision is required. It provides high standards of stability and repeatability demanded by highly conformal image-guided techniques.

Motion ranges

	Control	Range	Speed
Vertical	Motorized	1000 mm	2 mm to 45 mm/sec continuously adjustable
Lateral	Manual and motorized	±250 mm (500 mm)	
Longitudinal	Manual and motorized	1000 mm*	
Column rotation	Manual with electomagnetic brake	360° with indent at 0°	

* For the small bunker configuration movement is restricted to 500 mm

Table position indicators

	Accuracy	Resolution
Translational and vertical	±1 mm	1 mm

Maximum patient load

250 kg

Couchtops

The couchtop includes a unique homogenous sandwich design, containing no metal in the treatment area, and offers improved radio translucency with a minimized attenuation spread across the range of beam entry angles, providing the perfect solution for IMRT, VMAT and IGRT.

The construction provides high rigidity and strength, eliminating local patient sagging and permitting increased patient load.

Size	2000 mm x 530 mm x 50 mm
Weight	12 kg
Aluminum equivalence according to 21 CFR 1020.30	Mean value 0.64 mm Al
Indexing	BodyFIX® 14 indexing
Rigidity	The maximum permissible patient load distributed evenly on iBEAM evo couchtop is 250 kg (550 lb). The maximum load at the cranial end of the iBEAM evo couchtop (no extension attached) is 100 kg (220 lb).

Site requirements

This list includes only some relevant site requirements in general terms. For detailed site planning information, please refer to Site Planning Reference documentation.

Electrical
Electrical supply for linear accelerator: Peak power 30 kVA, Radiating 18 kVA; Three-phase, neutral and earth; Nominal voltage 380 to 420V, Nominal frequency 50 or 60Hz.

Water cooling
A supply of cooling water is required that can be configured as a one-pass system or a closed loop. If the hospital is not ordering an Elekta water cooler, the client is required to supply the linear accelerator with cooled water to the following specification:

- Temperature of water at input to the linear accelerator between 12° and 20°C
- Maximum flow 30 liters/minute
- Maximum (absolute) pressure at the input to the linear accelerator should not exceed 4 bar

Maximum heat input into the hospital water is approximately 12kW, so temperature gain of hospital water at 30 liters/minute flow is approximately 6°C.

Lighting
There should be no lighting on the ceiling or walls within 500 mm either side of the isocenter.

Cable ducting
Cable ducts are required to run from the rear of the accelerator to the control room. Ducting should be set into the concrete floor for this. Smaller ducts are required to run from the linear accelerator gantry to the water cooler (if used) and to the Client Interface Terminal.

Lifting equipment
An I-section girder with a safe working load (SWL) of 2,200 kg should be mounted on to the concrete ceiling directly above and parallel to the rotation axis of the gantry (end stops must be fitted if girder is open-ended).

Room safety and radiation protection
It should be noted that before constructing or modifying any treatment room, the design must have the approval of the National Radiological Protection Authority. Interlocks must be provided by the customer to interface the treatment room with the linear accelerator. These include emergency off switches, room door switches, radiation warning lights and a time delay switch. Connection to these and other customer interfaces is via an interface PCB. The PCB is provided by Elekta.

Elekta Care™ remote services

Elekta provides remote services dedicated to ensuring that customers derive ongoing value from their cancer management solutions, allowing them to use their assets efficiently and effectively to treat patients by maintaining peak operational performance to optimize clinical availability.

Remote services for Elekta Harmony is provided by Elekta IntelliMax™—a technology platform that allows data to be transferred between Elekta and the clinic as well as allowing Elekta to remotely access the linear accelerator.

Confidentiality and system security are maintained at all times, as remote access can only be undertaken with an approved customer representative present at the site during the connection.

By having Elekta IntelliMax support in place, customers enjoy enhanced clinical availability, quicker response times, speedier troubleshooting and access to Elekta's global team of technical experts and engineers throughout the working week—regardless of linear accelerator location.

Learn more at elekta.com/elektacare

- **Confidence in system uptime**
- **Excellence in clinical capability**
- **Partnership to maximize the lifetime value of your investment**

Appendix

Applicable international standards

The specifications declared in this document are based on the recommendations of the International Electrical Commission for the declaration of functional performance characteristics:

- IEC 60976:2007 Medical Electron Accelerators—Functional performance characteristics
- IEC 60977:2008 Medical Electron Accelerators—Guidelines for functional performance characteristics

The coordinate system convention applied in this document is:

- IEC 61217:2011 Radiotherapy equipment—Coordinates, movements and scales

Radiation leakage and other safety specifications comply with:

- IEC 60601-2-1:2009+A1:2014—Part 2-1: Particular requirements for the safety of electron accelerators in the range of 1 MeV to 50 MeV


Elekta
Harmony
Chambers, Jane
DOB:
03 Oct 1978
MRN:
TRN555555
Gender:
Female
Attending Physician:
Wilcox, Patti
Age:
41
Elekta Harmony
Head First
Supine
Image Panel Needed
Fields
Accessories
Setup Notes
Table
ISO + Tattoos
Verify all
View all
Capture

For almost five decades, Elekta has been a leader in precision radiation medicine.

Our more than 4,000 employees worldwide are committed to ensuring everyone in the world with cancer has access to—and benefits from—more precise, personalized radiotherapy treatments.

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Elekta Harmony is pending CE mark submission.
Not intended for U.S. audiences.
Not available in all markets.