



## **Behyaar** Sanaat Sepahan

Radiotherapy & Radiography Solutions | 2022

We are able to reduce the suffering, distress and hardship during the course of an illness with the use of our local knowledge and expertise

[www.behyaar.com](http://www.behyaar.com)



## Behyaar Sanaat Sepahan

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Behyaar Sanaat Sepahan has been manufacturing medical equipment since 1999. We started our activity in the field of medical equipment with designing and manufacturing the first Iranian Professional Stretcher. Now, after 23 years of activity, we are honored to manufacture more than 30 products which are divided into 5 main categories including:

- 1- Medical Linear Accelerator
- 2- U-Arm/Ceiling Radiology System
- 3- Hospital Beds and Hoteling
- 4- Surgical LED Lights
- 5- Surgical Tables (General, Orthopedic, Ophthalmic)

We work hard in order to help people in Iran and all over the world especially in Middle-East to overcome their illnesses. We believe that we are able to reduce the suffering, distress and hardship during the course of an illness with the use of our knowledge in Iran.

[www.behyaar.com](http://www.behyaar.com)  
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## Behyaar Cancer Treatment Solution

### OMID Medical Linear Accelerator

Behyaar company is honored to introduce OMID LINAC as a state-of-the-art medical linear accelerator to oncology centers. OMID LINAC helps more and more centers to gain the confidence to move towards advanced radiation treatment techniques. OMID LINAC has cost effective design and it is the gateway to modern RT for oncology centers that need to start small and an ideal replacement for cobalt technology. It is simple to operate, robust, allowing more patients to be treated quickly and effectively.

#### Key features:

- **Accurate Treatment Delivery**

OMID LINAC is capable of delivering a range of treatments from simple to complex, including IMRT.

- **Patient Comfort**

The elegant design of OMID LINAC, with exceptionally wide clearance, provides a reassuring environment for patients. It enables unrestricted access to allow easier patient set-up and sufficient equipment clearance to facilitate a wide range of gantry positions. This provides the flexibility and spatial requirements that are essential to support the use of advanced non-coplanar beam techniques for effective intensity modulated radiation treatments (IMRT).

- **Rapid and Accurate Patient Set-Up**

OMID LINAC's table allows fast and accurate patient positioning - ideal for modern treatment techniques where a high degree of precision is required in patient set-up. The low minimum height of OMID LINAC's table provides patient easier access with quiet and smooth movement. A professional Table Tablet Control panel and full control of table movements during set-up is considered. It controls simultaneous gantry and table movements.



## OMID LINAC Models

### 1- OMID 6MeV Single Energy

General Characteristics	
Beam Mode	Photon Based X-Ray
Nominal Energy	6MV
RF power source	Magnetron
Electron Gun	Diode
Depth of Maximum Dose	1.4 - 1.5cm
Percentage Depth Dose at 10cm	67% $\pm$ 1%
Quality Index, TPR <sub>20,10</sub>	0.67
Dose Rate	200 MU/min
Symmetry of radiation field (at 40*40 cm field and at Dmax )	$\leq$ 3%
Flatness 10 $\times$ 10cm <sup>2</sup> (at 40*40 cm field and at Dmax )	$\leq$ 3%
Multi Leaf Collimator	142 Leaves
Portal Image (optional)	Amorphous Silicon Detector, 1024x1024, 41 x41 cm
Treatment Mode(optional)	3D Conformal, IMRT, IGRT

### 2- OMID 10MeV Multi-Energy

Photon Beam Characteristics	
Nominal Energy	9MV - (6MV optional)
Dose Rate	300 MU/min
Depth of Maximum Dose	2.2 cm
Percentage Depth Dose at 10cm	73% $\pm$ 1%
Flatness 10 $\times$ 10cm <sup>2</sup> (at 40*40 cm field and at Dmax )	$\leq$ 3%
Symmetry of radiation field (at 40*40 cm field and at Dmax )	$\leq$ 2%
Multi Leaf Collimator	142 Leaves
Portal Image (optional)	Amorphous Silicon Detector, 1024x1024, 41 x41 cm
Treatment Mode(optional)	3D Conformal, IMRT, IGRT

Electron Beam Characteristics		
Nominal Energy	6MeV	10MeV
Dose Rate	300 MU/min	300 MU/min
Depth of Ionization (cm)		
90%	1.7	2.9
80%	1.9	3.3
50%	2.3	3.9
30%	$\leq$ 2.6	$\leq$ 4.3
Flatness	$\leq$ 5%	$\leq$ 4.5%
Symmetry	$\leq$ 2%	$\leq$ 2%



## Behyaar 142 Leaves MLC

### Accurate Delivery for Advanced Radiation Therapy

Conformal treatment delivery is essential to minimize dose outside of the target volume. With the advanced multi-leaf collimator, Behyaar 142 Leaves MLC, the radiation beam can be shaped to the target volume, quickly and accurately to enhance patient care. Behyaar 142 Leaves MLC is the beam shaping solution that provides more accurate delivery to the target with minimal damage to surrounding structures.

### Fast and Accurate

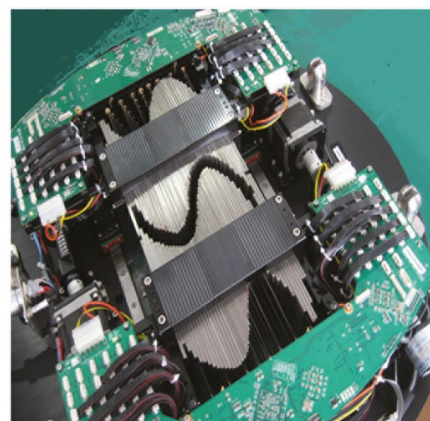
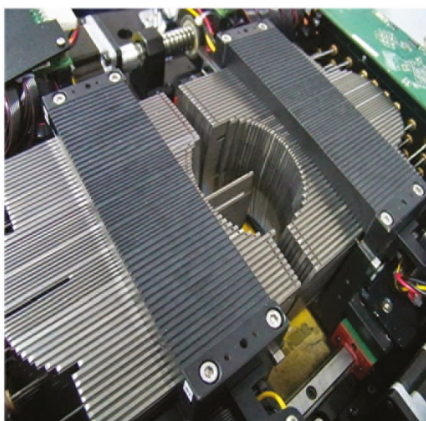
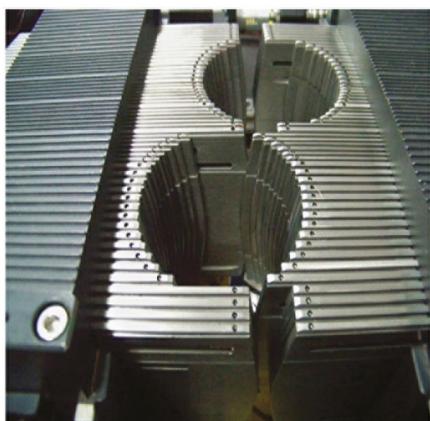
The integrated Behyaar 142 Leaves MLC provide high efficient workflows. The efficiency of the Behyaar 142 Leaves MLC is enhanced through its fast leaf speed and accuracy in leaf positioning for all treatment delivery techniques.

### Reduction Integral Dose

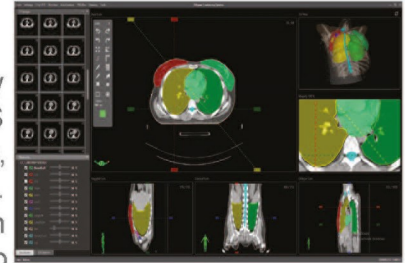
The active leakage reduction mechanism in the Behyaar 142 Leaves MLC, uses the diaphragms to automatically track the trailing leaf, thus interleaf transmission will be minimized. This feature plays a valuable role in reducing integral dose to the patient and therefore the side effects of their treatment will be minimized.

### Specifications:

Number of leaves	142
Direction of Travel of Leaves	IEC-X
leaf width @ Iso-center	Center (10 cm): interlaced leaves with 3.5 mm and 4.5 mm width Outer (30 cm): 6.5 mm
Max field size	40 x40 cm
Max over travel	80 mm
Max leaf speed	50 mm/s
Interleaf leakage	less than 2%
Position Accuracy	less than 1 mm
Application	3D Conformal, Stop and Shoot IMRT, Dynamic Sliding IMRT



## Behyaar Treatment Planning System



Behyaar TPS provides a treatment planning system for radiotherapy treatments. The powerful functionality and efficiency of the Behyaar TPS helps accurate modern radiation therapy planning for radiotherapy modalities, including 3D conformal and Intensity modulation radiation therapy (IMRT). Behyaar TPS delivers rapid and reliable registration of multiple data sets with automated image fusion. Automated contouring tools, including auto segmentation functionality and powerful drawing and editing features, allow easy identification and delineation of target volumes and critical structures. Behyaar TPS provides flexible plan review functions and powerful dose visualization with analysis tools in a customizable user layout. Generally, Behyaar TPS allows clinicians to efficiently create and verify the accurate treatment plans for their patients.

### Features:

#### Patient Contouring

- Automatic Contouring Module for patient organ at risks
- DICOM RT Import and Export Support Module
- Patient CT/MRI/PET Fusion Module
- User friendly tools for Contour Modification

#### Planning

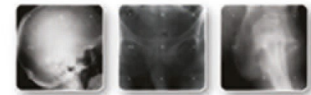
- 2D and 3D planning
- Conformal optimization
- IMRT utilizing step and shoot techniques

#### Dose calculation

- Enhanced pencil beam dose calculation algorithm
- Modified advanced dose calculation algorithm for Monte Carlo
- Equivalent photon calculation (Option)

#### Plan evaluation

- Multi-plan DVH comparison
- Biological evaluation (Option)



## Image Viewing System(IVS)-Optional

### IGRT Solution

Precise positioning of the patient is vitally important to ensure accurate dose delivery and minimal radiation of surrounding tissues. With a choice of imaging solutions, this can be done quickly and cost-effectively, ensuring more accurate treatment and valuable workflow efficiencies.

#### Accurate Patient Position Verification

IVS is OMID 6MV's IGRT solution. It registers the images with DRR's and calculates 3-dimensional shifts of targets and corrects the shifts when necessary. It is easy to use and it is cost effective – but not at the expense of quality. It harnesses high quality and real-time images for accurate patient position verification at an affordable price.

#### Excellent Digital Imaging

With using advance Amorphous Silicon Flat Panel MV X-ray detector technology combined with digital evaluation tools, IVS provides accurate patient re-positioning for confident reduction of margins and optimal treatment delivery. Base on precise treatment planning, such a function great improves TCP and reduces NTCP which increases a patient's survival rate.

### Specifications

Detector Type	Amorphous Silicon Digital X-Ray Flat Panel Detector
Area	16 inches
Total Pixel Number	1024x1024 / 2048x2048
Pitch	200 $\mu\text{m}$ / 400 $\mu\text{m}$
Energy Range	100 kV – 15MV
Dosimetric Verification	Optional- Includes Machine QA, MLC QA and Plan QA
Application	IMRT/ IGRT/ SRS/ SBRT



## Behyaar 3D Water Phantom

The Behyaar 3D water phantom system, is intended for radiotherapy dosimetry measurements. The acquired data could be used for LINAC acceptance testing, TPS beam data commissioning, monitor calibration and accelerator QA.

### Features:

■ **Accurate & Reliable:**

Behyaar 3D water phantom system is the right solution for crucial LINAC commissioning.

■ **Consistently accurate measurements in all dimensions:**

Small ionization chambers and diodes ensure scanning accuracy in any direction, regardless of detector movement and orientation (according to TG-106 report)

■ **MCU (Main Control Unit):**

Its compact design integrates a controller and two independent electrometers, simultaneous support of diodes and ionization chambers

■ **Computer Software:**

Behyaar 3D water phantom system has a user friendly software with many useful tools.

■ **Android Application:**

By the Android App on tablet or smart phones with an attractive graphical media user can control all movements of system from chamber location to table height and leveling the tank.

■ **Detector Holders:**

The Universal Holders enable fast and flexible mounting of all chambers and detectors in vertical and horizontal orientation.

■ **Water Reservoir:**

Separate tank trolley on wheels with a polyethylene water reservoir and a pump for bi-directional water transport. It's capable to turn on automatically when the phantom tank is empty

■ **Lift Table:**

The system is convenient in positioning and leveling. The stability of water tank is accrued by 4 Legs out of Isocentric rotation axis of treatment table. The required leveling is performed by two individual motors under water tank. the system sensors measures water surface relative to the scanning mechanism and automatically adjusts the water tank leveling using the electric motors



### Specifications

Water Tank	
Outer tank Dimensions (L×W×H)	670mm × 760mm × 750mm
Inner tank Dimensions (L×W×H)	580mm × 610mm × 580mm
Scanning volume	480mm × 480mm × 480mm
Approximate volume	200 L
Wall thickness / material	15 mm / PMMA
Weight (empty)	50 kg

Scanning Mechanism	
Motors	DC + Encoder
Position resolution	0.1 mm
Position accuracy	± 0.1 mm
Position reproducibility	± 0.1 mm
Positioning Speed	max. 30 mm/s

Dual-Channel Electrometer	
Maximum resolution	100 fA at 3nA full scale (16-bits)
Full scale range	3nA
Leakage current	typically <50 fA
Time constant	47 ms
Bias voltage range	±50 to ±400 V
Dimensions (L×W×H)	160mm × 100mm × 33mm

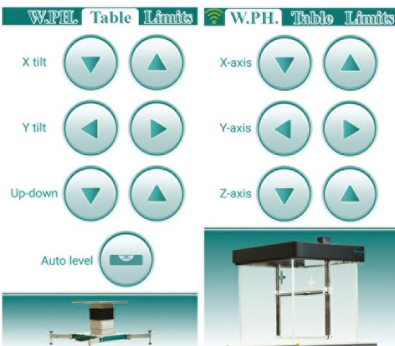
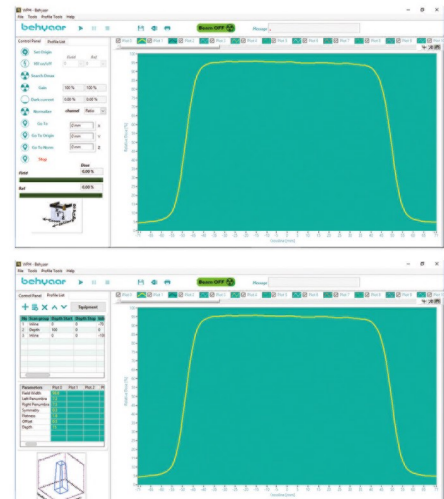


Lift Table	
Type	Lifting Carriage
Max. height above floor	1000mm
Min. height above floor	700mm
Moving range	300mm
Lateral & frontward Tilt	Motorize with tablet control
Time for full lift/ lowering	60s (with soft start & soft stop)
Total Dimensions (L×W×H)	1010mm × 720 mm × 700mm
Ground Clearance	30mm
Weight	152kg
Power Supply	220VAC ± 10 % 50Hz(with wire roller)

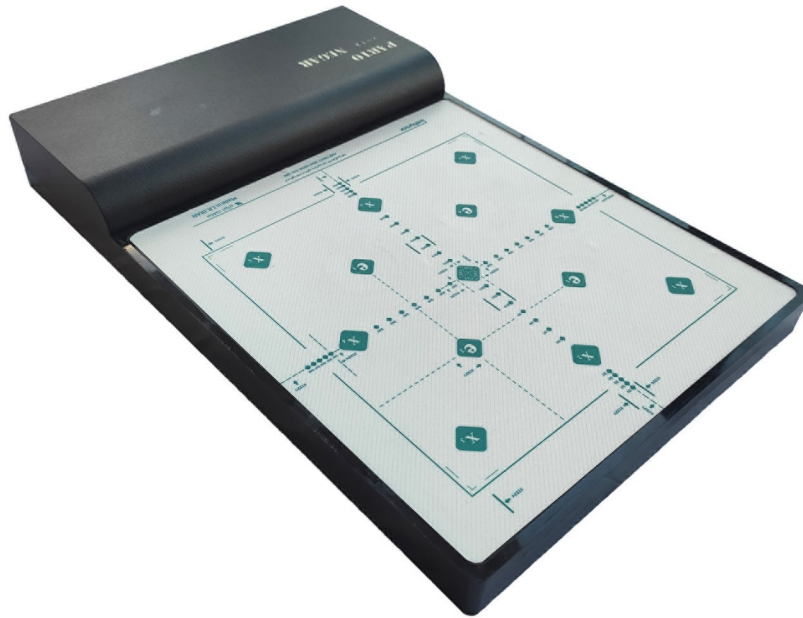


Water Reservoirs	
Pump direction	Bi-directional
Tank volume	200L
Flow control	approx. 50 L/min
Dimensions (L×W×H)	1000mm × 670mm × 1100mm
Weight (empty)	125kg
Max Fill / Drain Speed	4min
Power supply	220VAC ± 10 % 50Hz (with wire roller)

Minimum Computer Requirements	
Processor	Dual Core (or equivalent), 2.4 GHz or better
RAM	2 GB
Hard Drive Spaces	2 GB
Operating System	Windows XP, 7, 8 or 10 (32/64 bit)
Video Card Memory	64MB
Screen resolution	minimum 1280 × 1024 with 32-bit color



Tablet Control	
LCD	8" multi-touch
Operating system	Android
Communication Interface	Wi-Fi (for table & water phantom control)



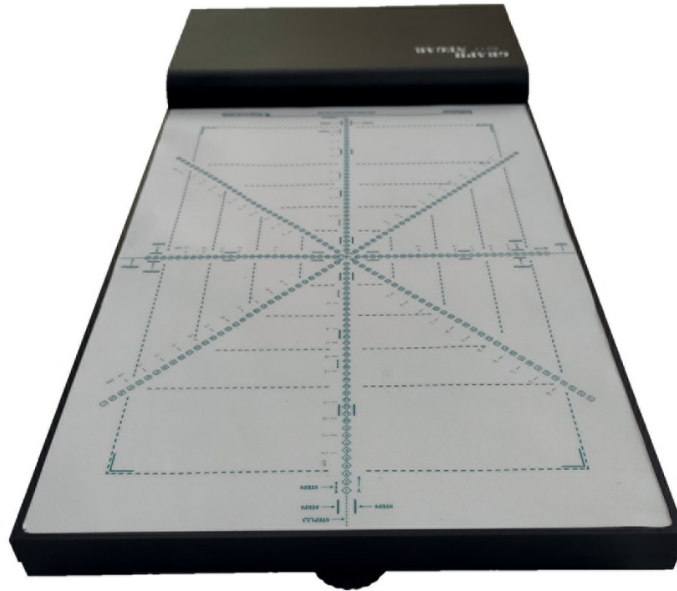
### Parto Negar

Using both diodes and ion chamber in Parto Negar to simultaneously checks output, flatness, symmetry, field size, energy and also profile graph in one device without the need to add buildup.

### Features

- Different beam quality checks including: flatness, symmetry, field size, energy, profile in 2 axis
- No flipping or additional buildup required for any test or energy
- High resolution penumbra measurement
- 13 Ion chambers measuring flatness, symmetry, energy
- 54 point consisted of diode detectors and ion chamber for profile graph
- Temperature and pressure measurement and corrections
- Wireless connection and rechargeable battery for full wireless setup and measurements
- Real-time measurements

Detector Type	Diode Detectors Vented Ion Chambers
Detector Spacing	Central Axis Diodes: 8.5 mm Marginal Diodes: 3.5 mm
Chamber Active Volume	Electron: 0.6 cm <sup>3</sup> Photon: 0.3 cm <sup>3</sup>
Field Size	20 x 20 cm
Inherent Buildup	Chambers: 1.0 ± 0.1 g/cm <sup>2</sup>
Inherent Backscatter	1.9 cm PMMA
Electron Energy Attenuation	Air, Cu, Al, Fe
Radiation Measured	Electrons, 4 MeV to 25 MeV Photons, Co-60 to 25 MV
Operating System	Windows 10 Professional
Dimensions (L/W/H)	38.8 × 25.6 × 5 cm
Weight	3.3 kg
Number Of Connection Cables	Power battery charger / data cable
Power	Battery and ext. battery charger 9V DC power supply (included)



## Graph Negar

Graph Negar is the high-resolution diode detectors matrix for fast and reliable quality assurance in radiotherapy. Graph Negar provides the perfect solution for beam and machine verification without the hassle of large phantoms, which is a great alternative to a water phantom for many tests including flatness, symmetry, field size, beam center, penumbra width, light-radiation field coincidence. They detect the dose along the main axes and diagonals. The result is the exact depiction of the profile in a resolution, which enables analyzing the beam without data interpolation.

## Features

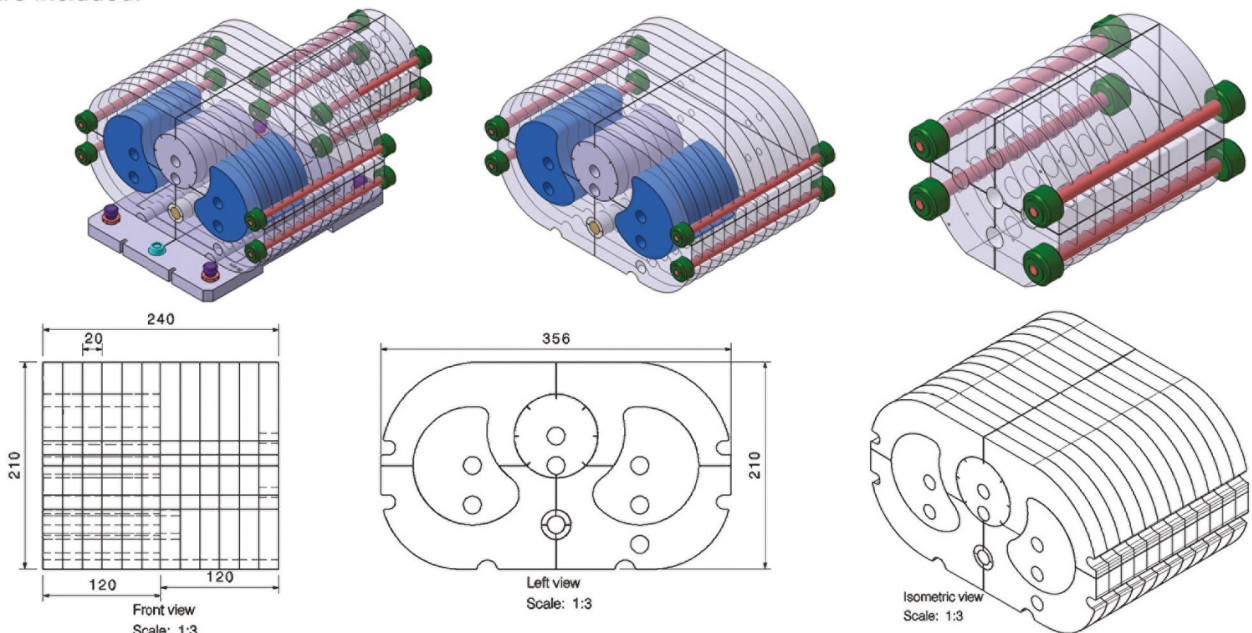
- Full-field real-time measurements:
  - ✓ Flatness, symmetry, field size, beam center, penumbra width, light/radiation field
  - ✓ Identify startup/time dependent anomalies
  - ✓ Beam constancy, steering, diagnostics, collimator and rotational sag QA
  - ✓ Electron energy verification
  - ✓ Photon energy verification
- Quick and easy setup
- Multiple real time parameter calculations
- Profile comparison, subtraction, overlay
- Report generation with output to PDF

Detector Type	Diode Detectors
Detector Spacing	4.2 mm
Detector Quantity	262
Field Size	20 × 30 cm
Inherent Buildup	0.9 cm PMMA
Inherent Backscatter	1 cm PMMA
Operating System	Windows 10 Professional
Dimensions (L/W/H)	50 × 26 × 6.5 cm
Weight	3.8 kg
Number of Connection Cables	Power / data cable
Power	Battery and ext. battery charger 9V DC power supply (included)



## Through Quality Assurance for CT Images and Treatment Planning System

The Behyaar Head and Body Phantom is designed specifically for sophisticated commissioning, comparison of TPS's, CTDI checks, IMRT verifications and checking delivery dose for both thorax and Head-Neck parts simultaneously. Head and Body phantom is made on the basis of average size and shape of a normal patient (elliptical shape). Phantom contains equivalent tissue materials that are similar to the behavior of the corresponding tissue in the presence of radiation. It has an adaptor for a Farmer chamber to check the ionization directly and the point dose is driven subsequently. Half of the thorax and the head part of the phantom is cut into 1cm sheets axially for adapting films (Radiographic or GafChromic®). Taking apart, assembling, and tightening the phantom is so easy for the user because of the user-friendly machinery and holding devices. Laser alignment is simple with the use of guiding lines on the phantom. Also CT markers for finding the exact places of critical sites are included.



Dimension	Thorax (WxHxL): 356mm x 210mm x 240mm Head (WxHxL): 140mm x 143mm x 180mm
Weight	Thorax: 17 Kg Head: 3.7 Kg Base plate: 2 Kg
Materials	Normal tissue: PMMA (1.18 g/cm <sup>3</sup> ) Lung: Foam (0.03 g/cm <sup>3</sup> ) Bone: PVC (1.38g/cm <sup>3</sup> ) Spinal Cord: Polyethylene ( 0.92 g/cm <sup>3</sup> ) Solid Insert: PMMA (1.18 g/cm <sup>3</sup> )

QTY	Part NO.	Description
1		Thorax section well drilled to adapt equivalent tissue rods
6	Bss-hb-002	2cm thorax sections
6	Bss-hb-003	2cm end thorax sections
6	Bss-hb-004	2cm head drilled sections
3	Bss-hb-005	2cm end head sections
12	Bss-hb-006	Water equivalent rods
6	Bss-hb-007	Mediastinal Insert
5	Bss-hb-008	Markers
1	Bss-hb-001	Alignment base
2	Bss-hb-009	Water equivalent rod inserts with Farmer ion chamber cavity
2	Bss-hb-010	Water equivalent insert for cavity of ion chamber holder with the sensitive volume marker

## Ionization chamber

### Farmer type Chamber

The standard chambers for dosimetry of high-energy photon and electron beams.

#### Specification:

Active Volume: 0.6 cm<sup>3</sup>  
 Waterproof  
 Vented to air  
 Fully guarded  
 Radial incidence  
 Suitable for absolute dosimetry  
 Energy range: 925- MeV  
 TNC or BNC connector with 1.5m triax cable

#### Material and measures:

Wall of Sensitive: 0.2 mm PMMA  
 0.35 mm Graphite  
 Central electrode: Al 99.9, Diameter 1 mm  
 Build-Up Cap: PMAA, thickness 4.7 mm

### Semiflex type Chamber

The standard chambers for dosimetry of high-energy photon and electron beams.

#### Specification:

Active Volume: 0.125 cm<sup>3</sup>  
 Waterproof  
 Vented to air  
 Fully guarded  
 Radial incidence  
 Suitable for absolute dosimetry  
 Energy range: 925- MeV  
 TNC or BNC connector with 1.5m triax cable

#### Material and measures:

Wall of Sensitive: 0.2 mm PMMA  
 0.35 mm Graphite  
 Central electrode: Al 99.9, Diameter 1 mm  
 Build-Up Cap: PMAA, thickness 4.7 mm



## Cerrobend

The lead blocks or the blocks containing heavy substances with high absorption of radiation have been used for the application of radiation therapy and in order to protect from health issues located in the path of radiation. The great disadvantage of lead is melting temperature and forming. So, accurate shielding of the healthy organs is impossible and laborious. For irregular radiation fields multileaf collimator and cerrobend, alloy blocks have been used to protect of health issues. The density of cerrobend alloy is 9.4 g/cm<sup>3</sup>.

Cerrobend alloy contains Bismuth (50%), Lead (26.7), Tin (13.3), and Cadmium (10%). The advantage of Cerrobend in comparison with lead is the lower melting temperature of Cerrobend which is 70 °C while the melting temperature of lead is 327 °C. On the other hand, in the same energy level, more Cerrobend thickness is required in comparison with lead (Approximately 1.2). If the lead and Cerrobend blocks are used at the same physical conditions for 10MV, crossing over of the lead block will be slower than Cerrobend which is about 27.3% (which shows more absorption of Cerrobend in comparison with the lead).





## Omid 2D Cutter

### Radiotherapy Shielding Block Mold Cutter

The Omid 2D block cutter is designed for providing individual blocks for a patient in Radiotherapy. Digitized block outline and computer-controlled block cutting ensure the cutting precision within 0.5mm. Its compatibility with the treatment planning system achieves fast cutting.

#### Features:

##### Precision Accuracy

- Computerized and four-axis cutter ensures accuracy of  $\pm 0.5$  mm.
- Built-in checks minimize operator error and time consuming re-cuts.
- Allows review of outline on monitor.
- Cut path simulation prior to actual block cut.
- All functions and setups are completely computer controlled.

##### Treatment Planning Interfaces

- Digitized block outlines can be easily transferred from treatment planning.
- Eliminates redundant input of block outlines from radiographs.

##### Control performance

- User can select any cut paths to connect multiple block outline
- Windows based program digitizes and stores data and patient files for easy reference or modification.

##### Convenient Operation

- Digitized block outlines can be auto-arranged on foam and be imported together, then be exported for cutting together.
- It is less than 20 seconds from importing files to cutting foam.

##### Quick Modifications

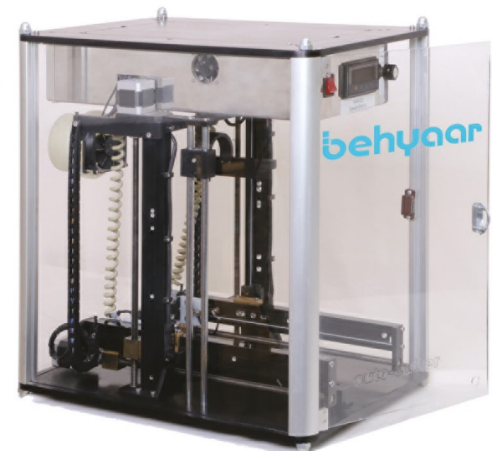
- Ability to "flip" image for fast AP/PA or L/R lateral blocks, or change any parameter and do not need to input data again.

##### Hot Wire Cutting

- Image can be moved to any position on the block to allow for the conservation of Styrofoam use.
- Fast (8 mm/ Sec) cut speed
- Adjustable temperature for variations in foam densities.
- Custom defaults for SSD, SAD and STD.
- Distance changes can be factored in TPS import.

##### Versatile Configurations

- Our system can be purchased as a cutter and software package only, or with Melting Pot, Cooling Plate, Cerobend and Foam.





## BEHYAAR LASER Systems

The main goal of using the laser in radiotherapy is to reproduce the patient's position during imaging and treatment. The Behyaar LASER System is used in order to reproduce the patient's positioning in subsequent simulation by Computed tomography (CT) scans and treatment by linear accelerator (LINAC). The treatment isocenter location is identified based on target volumes and treatment area. Once the isocenter is determined or "marked", this coordinate is part of the treatment plan and can be used as a reference location in subsequent dose calculations. For the patient marking, external laser systems are essential: A set of localization marks on the skin of the patient is necessary so that the patient can be accurately repositioned on the LINAC.

Behyaar have three different types of laser as follow.

### 1- Movable LASER

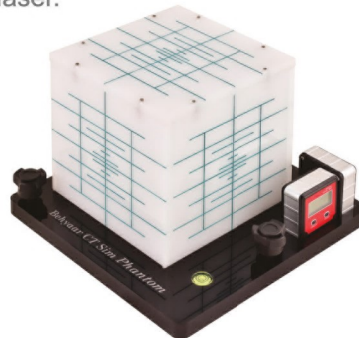
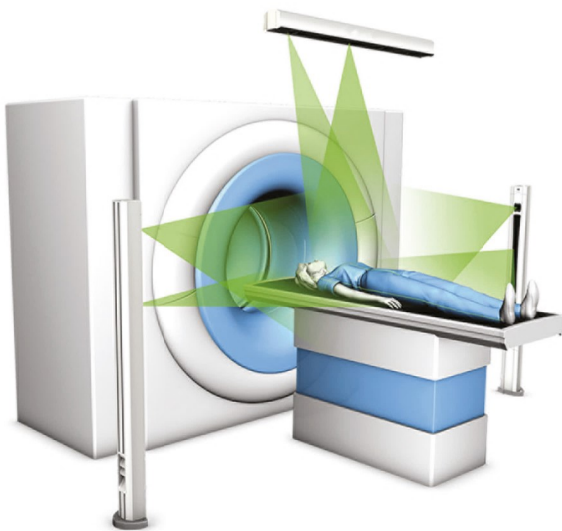
Behyaar Movable LASER consists of three arms with fixed and movable laser modules for projecting lines to mark the patient in all three body planes. All three arm of the laser system is installed in a part of the CT room. One arm of the device is mounted on the ceiling above the couch, the other two laser systems are standing flat on the sides of the couch. The ceiling arm has one movable laser for display of sagittal line and one fixed laser for display of transverse line and the standing arms each have one movable laser to display the coronal lines and one fixed laser for display of transverse lines

### 2- Fixed-Movable LASER

Fixed-Movable LASER system consists of one ceiling arm with a fixed and a movable laser module and two fixed sides lasers for projecting lines to mark the patient in all three body planes. The ceiling arm has one movable laser for display of sagittal line and one fixed laser for display of transverse line and the standing arms cross laser to display transverse and coronal lines

### 3- Fixed LASER

Fixed lasers are necessary tools for aligning the patient, daily reference isocenter adjustments and assuring optimized isocenter accuracy for linear accelerators. Fixed laser consists of three cross laser.



### BEHYAAR LASER Features

- The Complete Connectivity Suite includes Handheld Wireless system for in room control
- Tablet Control Monitor for convenient patient workflow
- Excel file interconnectivity
- Comprehensive travel range
- Sub-millimeter accuracy with zero drift
- Multiple Installation Configurations
  - Wall / Ceiling
  - Bridge
  - Floor Mount Post

Power Supply	
External power supply	100 - 240 Vac, 50 - 60 Hz
Internal voltage	24Vdc for movable system 3 – 5Vdc for fixed system
Laser	
Laser wave length	635 nm (red)
Laser class	1
Focusable range	1 - 4 m
Line length at 3m distance	More than 3 m
Line width up to 3m distance	Less than 1mm
Laser output power	Less than 1mW
Movable system characteristics	
Dimensions (W × H × D)	118 × 17 × 18 cm
Weight	11kg
Operating temperature	0 - 40°C
Travel range	700 mm
Travel speed	Up to 25mm/s
Positioning accuracy	±0.1 mm
Projection accuracy	±0.5 mm
Calibration Phantom	Optional
Fixed system characteristics	
Dimensions (W × H × D)	21 × 15 × 19 cm
Weight	5 kg
Operating temperature	0 - 40°C
Self leveling range	±5°



### Behyaar 16 CT

The demanding for more accurate diagnostic procedure is continually on the rise. Healthcare institutions and physicians are being pressured to produce more efficient diagnose. Behyaar 16 CT configuration is a high performance system that is ideally suited for routine CT studies and advanced motion-sensitive applications like Pulmonary studies. With fast reconstruction and many automated tools for setting up patients and managing scans, it can help you increase throughput. Behyaar 16 CT also includes features to help maximize dose efficiency.

### Key Features

- Fast Scanning with reliable results
- Friendly user interface
- Standard and consistent image quality
- Efficient detector design
- Low dose application package

### Gantry

Aperture	70 cm
Scan FOV	50 cm
Tilt	±30°
Scan speed (360°)	0.5 s, 0.75 s, 1.0 s, 1.5 s, 2.0 s
Focus-to-isocenter distance	570 mm
Focus-to-detector distance	1050 mm



### Data Acquisition System

Maximum number of slices/rotation	16
Number of detector rows	16
Number of detector elements	800 x 16
Maximum number of projections/rotation	4000
Surview acquisition modes	2 x 0.5
Axial acquisition modes	16 x 0.5, 8 x 1, 2 x 0.5
Spiral acquisition modes	16 x 0.5, 8 x 1
Detector type	Solid - state GOS ceramic

### X-Ray Tube Assembly

Tube current range	10 mA ~ 400 mA
Tube voltage	80 kV, 100 kV, 120 kV, 140 kV
Tube anode heat storage capacity	3.5 MHu
Dissipation rate	600 kHU / min
Focal spot size	0.6 x 0.9 (Small), 1.2 x 1.2 (large)

### Couch

Maximum couch load	180 kg
Horizontal motion speed	1 mm/s - 150 mm/s
Vertical movement range	430 mm - 970 mm (from cradle bottom to ground)
Vertical motion speed	9 mm/s - 15 mm/s
Couch horizontal movement range	0 - 1750 mm

### Host Computer System

The host computer workplace provides an intelligent and reliable workflow for data acquisition, image reconstruction and routine post processing at the CT scanner.	
Standard Monitor	Medical 19 inches
RAM storage	Host: 8GB - Recon: 32GB

### System Performance

Surview	
Maximum length	1650 mm
Scan width	500 mm
Views	AP, lateral, dual
Real-time surview	Yes
Axial	
Slice thickness	0.625 mm, 1.25 mm, 2.5 mm, 5 mm, 10 mm
Reconstruction FOV	50 mm ~ 500 mm
Maximum Length	1700 mm

### Image Reconstruction

Maximum recon speed	7 image/Sec
Recon matrix	512 x 512, 1024 x 1024
CT value	-1024~3072; Support extended -32768~32767
Slice thickness	0.625 mm, 0.8 mm, 1 mm, 1.25 mm, 1.5 mm, 2 mm, 2.5 mm, 3 mm, 4 mm, 5 mm, 6 mm, 7 mm, 8 mm, 9 mm, 10 mm
Reconstruction FOV	50 mm ~ 500 mm
Scan time Maximum	100 s (uninterrupted)
Scan length	1700 mm
Pitch factor	0.2 to 1 (continuous)



## Behyaar Digital X-RAY System (Fully Motorized & Automated)

### Best Image quality with advanced Image Processing Options

- Offers advanced features in one flexible package that fits into any practice
- Digital image acquisition supports fast and efficient exams
- Anatomical view-based digital image processing
- Automatic image store and print with DICOM 3.0 networking capabilities
- Customizable image processing allows users to personalize the system
- Optional image paste for multi-image acquisition and reconstruction
- Smart Window automatically determines optimum
- Brightness and contrast for image display
- Touch-screen single monitor for image display and system control

### Flexible for any practice and Fit for any Spaces

- Cost-effective digital option with unmatched clinical flexibility.
- Handle the most challenging exams with the angling flexibility of the positioner.

### Others

Automatic collimation (option)

Scatter Radiation Grid: 460 mm × 460 mm, 215 lp/inch, 10:1

Dose Area Product (DAP)

Control Interface Box (CIB)

Touch Panel Imaging Workstation with advanced Image Processing features

### Generator System

Generator Specifications	
Output	32, 40, 50, 65 and 80 kW
Frequency	Up to 100 kHz
Exposure voltage	40 to 125 kVp or 40 to 150 kVp (depending on selected kW)
mA range	10 to 1000mA (depending on selected kW)
Time range	0.001 to 10 Sec.
Input rating	400 /480VAC 50 /60Hz
Anode rotation speed	Dual speed

### X-ray Tube

Tube Specifications	
Focal spot	0.6 /1.2mm
kHU	150, 300, 400 and 600 (depending on selected kW )
Capacity of the small/large focus	32/95 kW
Anode angle	12°

### Detector

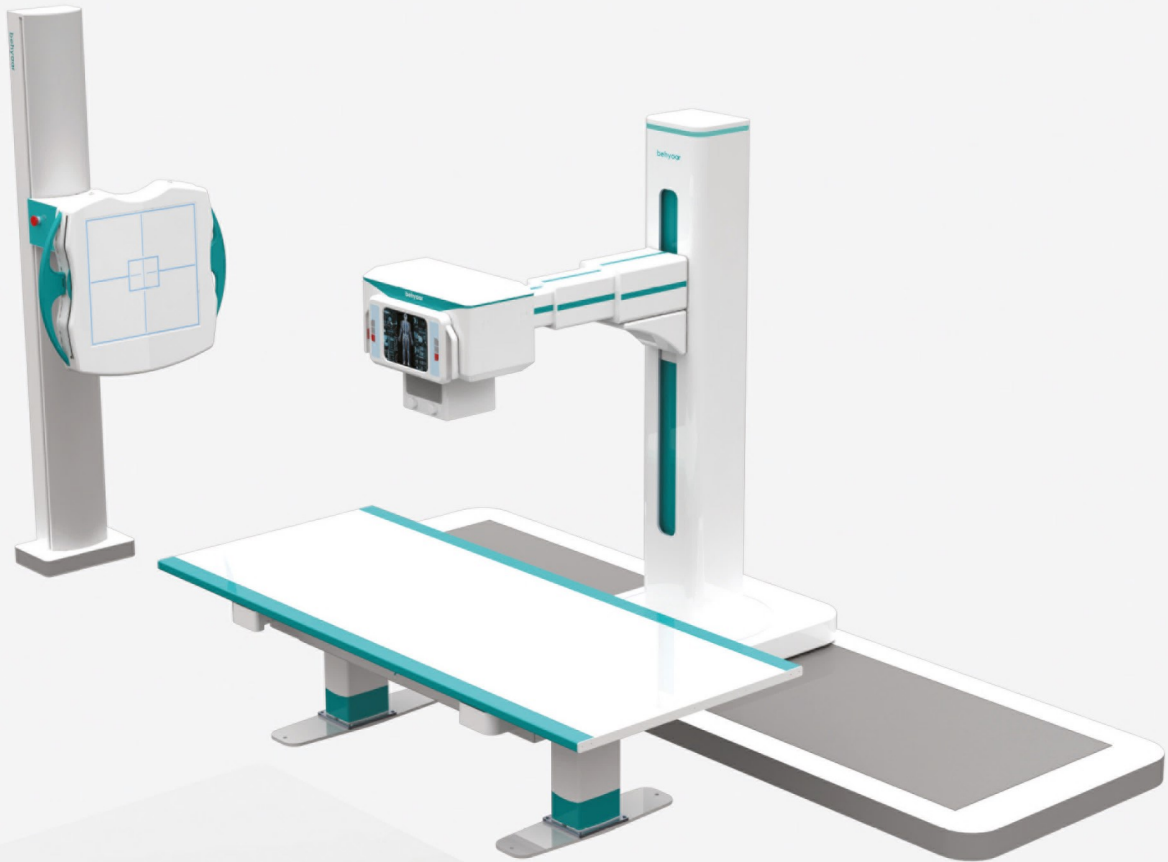
Detector Specifications	
Receptor Type	Amorphous Silicon
Scintillator	Direct Deposit CsI, Detached CsI, DRZ Plus
Pixel pitch	139µm
Image Field	3,072 x 3,072 (9.4million pixels)
Dimensions (W x D x H)	468.8×469.1×37.6 mm Equivalent to Standard 17x17" cassette
A/D Conversion	16-bits
Cycle Time (minimum/standard)	6 / 8 sec.



## Behyaar Digital Ceiling X-RAY System (Fully Motorized & Automated)

<b>Ceiling suspension</b>	
Horizontal Travel Range (Typical)	Longitudinal: 3m Transvers: 2.5m
Vertical Travel Range	180cm
Tube Rotation Range around vertical axis	$\pm 180^\circ$
Tube Rotation Range around horizontal axis	$\pm 135^\circ$
Vertical Movement Speed	100mm/sec
Movement	Motorized-manual
Tracking	Auto tracking on wall and table
Auto Positioning	Available (based on room size)
<b>Table</b>	
Table Top Dimensions	2400mm $\times$ 900mm
Elevation (Up/Down) Range	545mm $\sim$ 1000mm
Longitudinal (Left/Right) Movement Range	$\pm 500$ mm
Transverse (Front/Rare) Movement Range	$\pm 150$ mm
Max. Patient Weight	150kg
Elevation From Min to Max (No Load)	50mm/sec
AEC	Three - field ionization chamber
Movement	Motorized
<b>Wall Stand</b>	
Up/Down Range	400mm $\sim$ 1800mm
Detector Tilting	$-20^\circ \sim +90^\circ$
AEC	Three - field ionization chamber
Grid	Manually exchangeable
Movement	Motorized





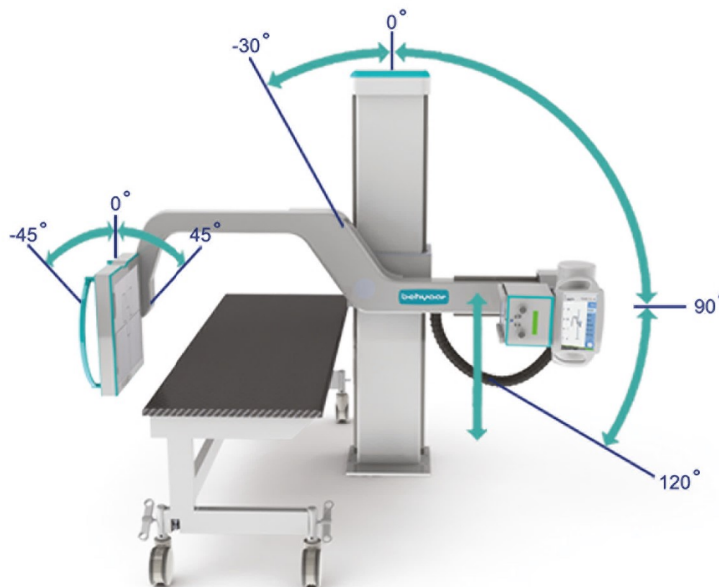
## Floor-Mounted Radiology

Column stand	
Longitudinal travel range	Long rail: 231 cm Medium rail: 152 cm Short rail: 66 cm
Vertical travel range	147 cm
Lowest central beam height	33 cm
Column stand rotation	$\pm 180^\circ$ , detents at $0^\circ$ , $\pm 90^\circ$ , $+ 180^\circ$
X-ray tube rotation range	$\pm 140^\circ$ , detents at $0^\circ$ , $\pm 90^\circ$
Movement	Motorized-manual
Tracking	Auto tracking on wall and table
Auto Positioning	Available (based on room size)
Table	
Table Top Dimensions	2400mm $\times$ 900mm
Elevation (Up/Down) Range	545mm ~ 1000mm
Longitudinal (Left/Right) Movement Range	$\pm 500$ mm
Transverse (Front/Rare) Movement Range	$\pm 150$ mm
Max. Patient Weight	150kg
Elevation From Min to Max (No Load)	50mm/sec
AEC	Three -field ionization chamber
Movement	Motorized
Wall Stand	
Up/Down Range	400mm ~ 1800mm
Detector Tilting	$-20^\circ$ ~ $+90^\circ$
AEC	Three -field ionization chamber
Grid	Manually exchangeable
Movement	Motorized



**Behyaar Digital U-ARM X-RAY System (Fully Motorized & Automated)**

<b>U-Arm</b>	
Z arm movement	Vertical Transverse Distance: 1200mm Moving Speed: 100mm/sec (HS) 50mm/sec (LS) Rotation Angle: -30° ~ +120°
SID	Moving Distance: 800mm Moving Range: 950mm ~ 1750mm
Bucky Movement	Rotation Angle: -45° ~ +45°
Movement	Motorized
<b>Table</b>	
Table Top Dimensions	2500mm × 700mm
Table Height	750mm
Max. Patient Weight	200kg







## Portable System

X-Ray Generator	
Output	20 kW
Frequency(up to)	Up to 100 kHz
Exposure voltage	40 to 125 kVp
mA range	10 to 320mA
Time range	5 to 1000 ms
Input rating	200 /240VAC 50/60Hz
Detector	
Detector Type	Digital Cesium Iodide (CsI)
Detector sizes	35 cm x 43 cm (14" x 17")
Image matrix size	2330 x 2846 pixel
Detector pixels	6.7 Megapixels
Image resolution	up to 3.38 Lp/mm
Pixel size	148 μm
Geometry	
Focal point distance from column	min: 650 mm
	max: 1210 mm
Focal point distance from floor	min: 600 mm
	max: 1900 mm
Tube column rotation	±320°
Motorization	0 - 5 km/h
Dimensions (l x w x h)	138 x 90 x 200 cm
Weight	385 kg



## C-Arm System

X-Ray Generator	
Output	3kW
Frequency(up to)	Upto 100 kHz
Exposure voltage	40 to 120 kVp
mA range	1 to 30 mA
Time range	10 ms to 4 S in Radiology mode Up to 4 mins in Fluoroscoov mode
Input rating	200 /240VAC 50/60Hz
X-RayTube	Mono-block Stationary anode tube
Detector	
Detector technology	Image intensifier
Field of view	Triple-mode 31 cm (12")
Image resolution	1 K
Monitors	2 x 19" standard color
Geometr	
SID	89cm
Free space within C-Arm	72cm
Orbital rotation	115° (90°underscan / 25°overscan) - 35°overscan optional
Lateral rotation	450° (+225°/-225°)
Wig/Wag	24° (+12°/-12°)
Horizontal travel	40cm
Dimensions (l x w x h)	205x80x173cm
Weight	370kg
Break for all movements	electrical