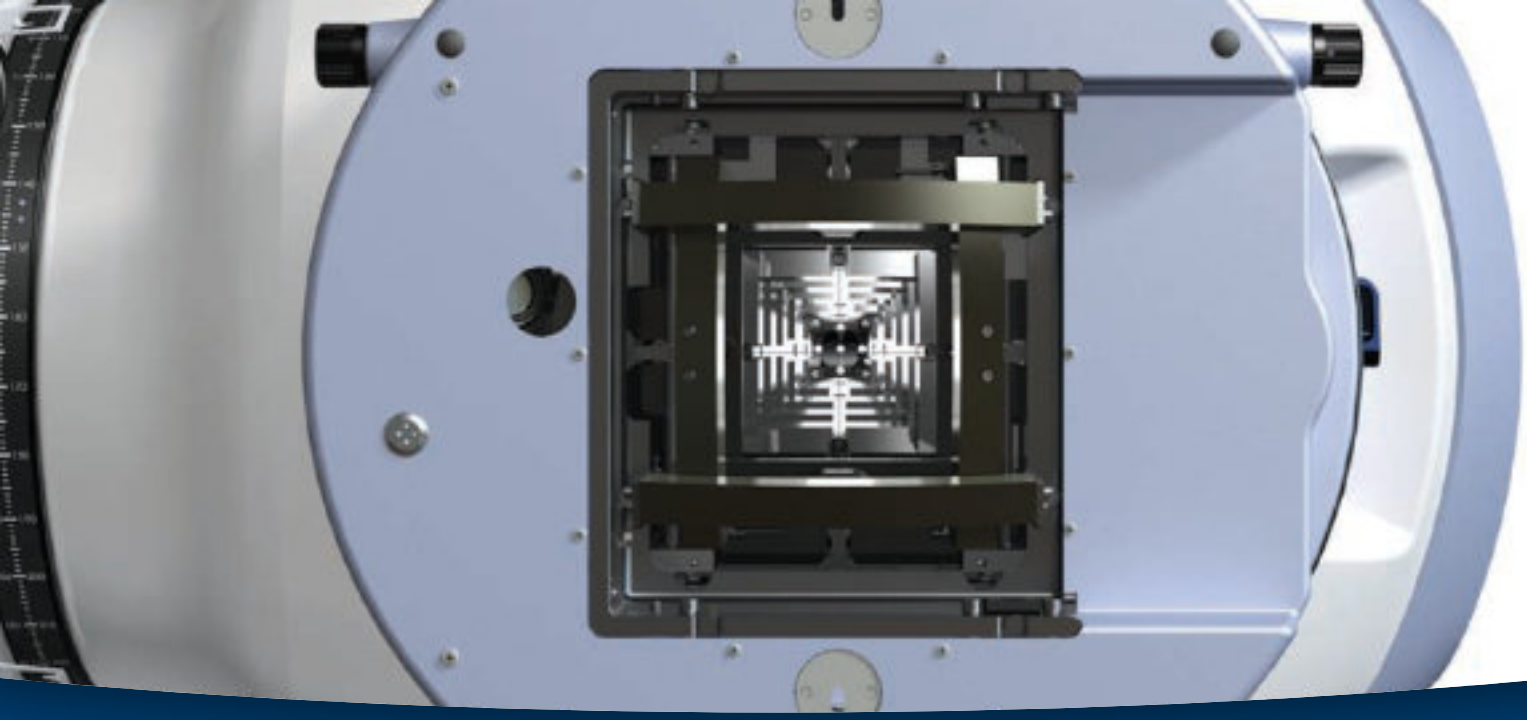
Best®
Theratronics

GammaBeam™
saving lives

GammaBeam™ X200

RESEARCH IRRADIATOR



Built on experience. Built for research.

The Gammabeam® X200 (GBX200) is among the most versatile research irradiators available today. Suited to a broad spectrum of applications including secondary standards dosimetry, sterile insect programs, and medical or veterinary research, the unit provides your lab with a powerful tool. The Best Theratronics GBX200 is the latest in a long line of irradiators that researchers and clinicians have trusted and depended on for decades. Its expert design is based on more than 40 years of irradiator experience and backed by an industry-leading commitment to safety, quality, and customer support.

The GBX200 has a Cobalt-60 capacity of 434 TBq (11,725 Ci) and can deliver a dose rate of 800 cGy/min at 50 centimeters from the source at maximum f eld size. With easy-to-use controls and safety features that meet or exceed all applicable regulations, the unit is a valuable tool for those requiring a dry storage panoramic f eld irradiator.

The f eld size of the GBX200 can be collimated manually to the following settings:

Distance from Source, cm	Normal Field Size, cm x cm		Approximate Max Unit Output – Air Kerma Rate in cGy / min
	Minimum	Maximum	
40	**0.5 x 0.5**	**17.5 x 17.5**	**1250**
80	**1.0 x 1.0**	**35.0 x 35.0**	**313**
160	**2.0 x 2.0**	**70.0 x 70.0**	**78**
240	**3.0 x 3.0**	**105 x 105**	**35**

To assist with installation, Best Theratronics provides a standard shielded-room drawing on which site-specif c design plans can be based.

Features

- Field light and ODI ensure that product is contained within the beam • Flexibility – high or low dose depending on distance from the source • Large f eld size
- Asymmetric collimator jaws provide f exible f eld conf gurations
- Battery based power supply system allows uninterrupted unit operation • Irradiation time is monitored/controlled by two independent timers
- Graphic User Interface and touch-screen provide easy routine operations and diagnostics

Technical Specifications

Features

Regulatory Requirements

The GBX200 complies with the regulations or recommendations of the CNSC, IAEA, USNRC, NCRP, ICRU and ICRP. The unit also complies with IEC60601-1: 2005, IEC60601-1-2: 2007, IEC60601-2-11:2004, and EU's Low Voltage Directive, making it CE Mark compliant. Contact Best Theratronics for further information.

Recommended Environmental Conditions

- Temperature from +5˚C to +40˚C
- Humidity below 50% at 40˚C and between 10% and 90% at 25˚C
- Elevation less than 1000 m above sea level

Electrical Service Requirements

- Single phase 60 Hz ±3 Hz, 115 Vac ±10% or single phase 50 Hz ±3 Hz, 230 Vac ±10%
- Maximum power consumption is less than 0.75 kw

Dimensions and Weights

Base Foot Print	Approximately 112 cm x 195 cm (44 in. x 77 in.), or 102 cm x 211 cm (41 in. x 83 in.), upon unit configuration
Height	Approximately 173 cm (68 in.)
Weight	Approximately 2000 Kg (4400 lbs.) ±10%
Console to Unit Cable Length	30 m (100 ft.)

Radiation Specifications

Head Leakage

The head leakage does not exceed 2 mR/hr at 1 m from the source. Transmission through the head with the source in the exposed position does not exceed 0.1% of the primary beam. The guaranteed capacity of the therapy head is 11,725 Ci.

Collimator Leakage

Collimator transmission leakage shall not exceed 2% of the useful beam exposure rate.

Prescribed Exposure Time

The range of prescribed exposure time for the GBX200 is 00.01 to 90.00. This represents minutes, hours or days, depending on the selected mode.

Motions

Collimator X and Y Field Motions

The opening and closing of the collimator leaves is controlled by knobs located on the sides of the collimator.

Collimator Rotation

The collimator will rotate ±180˚ from the central position and can be locked in any required position. Collimator rotation axis tolerance is 1 mm from the mechanical centre of rotation, measured at 80 cm from the face of the source.

Optional Head Rotation

The head can rotate ±180˚ from the zero position for a total of 360˚ by means of a hand wheel located on the neck near the head. The head can be locked at 90˚ or 270˚ in respect to the vertical position.

Field Def ning System

The intensity of the f eld def ning lamp at isocentre is at least 25 lux. Lamp life is rated for 5000 hours.

Optical Distance Indicator

Lamp life is rated for 500 hours. The ODI range is 60 to 100 cm. The ODI accuracy is within 1 mm at 80 cm ± 10 cm, and within 2 mm at 80 cm ± 20 cm.

Control System

Pneumatic and Source Carrier

The source drawer is a standard lead and brass Best Theratronics round drawer G9-095. The source drawer is moved between the Fully Shielded and Fully Exposed positions by an air cylinder. The air compressor and control systems are designed to return the source to the shielded position in the event of a power failure.

Source Transit Time

The time for the source to travel between the on and the off positions is 1.5 to 2.0 seconds.
Shutter Error may be automatically compensated by the control system, if conf gured.

Safety Features

Source Position Indicators

A red Fully Exposed lamp, a red In Transit lamp, a amber Fully Shielded lamp, and an audible indicator are located on the remote Control Console and indicate the position of the source carrier.

A green Beam Off lamp, a red Beam On lamp, and a red indicator rod that protrudes through the cover when the source is in or nearly in the Fully Exposed position, are located on the head of the GBX200 and indicate the position of the source carrier.

Manual Source Lock

An auxiliary lock mechanism is provided to lock the source in the Fully Shielded position when the unit is not in use.

Audible Alarm

An audible alarm in the main frame sounds when the power key-switch is in the ON position, the door is open and the source carrier electrical drive system has failed.

Examples of Chambers for Calibration

Interlock Conditions

The source returns to, or remains in, the Fully Shielded under the following interlock conditions:

A. The shielded room door is open.
B. The User-Interlock switch is open.
C. The air pressure is less than 30 psig.
D. The collimator is pointing at an area not adequately shielded.
E. Irradiation ends.
F. Operator induces a pause through control console screen.
G. Irradiation time is not selected or incorrectly selected. H. Wedge or Tray is not correctly selected.

The following conditions will terminate and prevent further irradiation until the fault has been corrected and the system turned Off and On again:

A. Source fails to move from the Off position during irradiation. B. Source travel time exceeds 2.5 seconds.
C. One of the source position indicator switches fails.
D. The source fails to return to the Fully Shielded position at the end of irradiation.
E. The source fails to remain in the Off position except during irradiation.
F. The values of two irradiation timers mismatch.

Room Access Control

The irradiator control system will not allow a source exposure if any of the following room access control devices are not wired and functional:

A. A built-in delay circuit delays the exposure of the source for 1~60 seconds (user conf gurable) and activates a warning signal after the irradiation has been activated.
B. (Optional) A wall switch located in the irradiation room. Once the wall switch is activated, the door must be closed within 30 seconds.

External Connections

- Shielded Room Door switch
- User-interlock switch (for connecting other safety devices, such as f re/smoke detector, unwanted irradiation detector, etc.)
- Shielded Room Door status indication contacts
- BEAM ON indication contacts (for remote indicator lights of the beam status)
- READY state indication contacts
- START-DELAY indication contacts

Healthcare For Everyone

Best® Theratronics' products and services are used throughout the world to prevent, diagnose and treat disease. Our applied research and innovation play an integral part in improving global healthcare.

"Our TeamBest® companies are committed to making quality healthcare affordable and accessible globally."

Krishnan Suthanthiran
President, Best Medical International

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