

Best[®]
Theratronics



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 field 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 field irradiator.

The field 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	
50	2.5 x 2.5	21.5 x 21.5	800
100	5 x 5	43 x 43	200
200	10 x 10	86 x 86	50
300	15 x 15	129 x 129	22

To assist with installation, Best® Theratronics provides a standard shielded-room drawing on which site-specific 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 field size
- Unit remembers cycle time if cycle is interrupted

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 EN ISO 12100-1&2: 2003, EN 1050:1996, EN 60204-1:2005, EN 61000-6-2:2005, and EN 61000-6-4:2001 standards, 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 60Hz ±3Hz, 115 Vac ±10% or single phase 50Hz ±3Hz, 230 Vac ±10%
- Maximum continuous current is 10A at 115 Vac or 5A at 230 Vac

DIMENSIONS AND WEIGHTS

Base Foot Print	Approximately 102 cm x 200 cm (40 in. x 79 in.)
Height	Approximately 183 cm (72 in.)
Weight	Approximately 2000 Kg (4400 lbs.) ±10%
Console to Unit Cable Length	27 m (90 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 Gammabeam® X200 is 00.00 to 99.99. 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 ±185° 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 DEFINING SYSTEM

The intensity of the field defining 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 \pm 10 cm, and within 2 mm at 80 cm \pm 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.

The control system provides local and remote (outside the irradiation room) controls for the irradiation process.

SAFETY FEATURES

SOURCE POSITION INDICATORS

A red Fully Exposed lamp, a yellow In Transit lamp, a green 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 position during an electrical power interruption or during the following interlock conditions:

- The shielded room door is open.
- The air pressure is less than 30 psig.
- Irradiation ends.
- Operator induces a pause by pressing any of the console buttons during irradiation.
- Electrical supply is restored after an interruption.
- Irradiation time is not selected or incorrectly selected.

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

- Source fails to move from the Off position during irradiation.
- Source travel time exceeds 2.5 seconds.
- One of the source position indicator switches fails.
- The source fails to return to the Fully Shielded position at the end of irradiation.
- The source fails to remain in the Off position except during irradiation.
- Internal memory check fails.

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:

- An independent back up control of the room access (independent of the Shielded Room Door switch).
- A radiation monitor, located inside the entrance to the irradiation room, to detect the presence of non-shielded source radiation fields.
- A built-in delay circuit delays the exposure of the source for 15, 30, 45, or 60 seconds (factory set option) and activates a warning signal after the irradiation has been activated.
- 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
- Independent room access detection system
- Remote indicator lights of the beam status
- Door electric lock
- Emergency switches
- Imminent "Beam On" visual and audible signal
- Radiation detector
- Smoke detector
- Heat detector
- Fire alarm
- Intrusion alarm
- Unwanted radiation alarm
- Remotely controlled fire extinguishing system

The irradiator is not operable if any of the above systems is not connected to interlock the exposure of the source or available in case of emergency.

Healthcare For Everyone

Team Best® Is Your Single Source Oncology Solutions Provider.

“Our Team Best® companies are committed to making quality healthcare affordable and accessible globally.”

Krishnan Suthanthiran
President, Best Medical International

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