

**TECHNICAL SPECIFICATIONS FOR
COBALT-60 TELETHERAPY MACHINE
(Includes the supply, delivery, installation
and commissioning of unit)**

Application/Use

Radiation therapy/radiation oncology - external beam therapy

Standard Composition

- Gantry
- Head Assembly
- Control Console
- Treatment Couch/Patient Support Assembly
- Machine Interlock System
- Control Mechanism
- Beam Stopper (**optional**)
- Machine Installation
- Power Requirement
- Accessories
- Other Requirements
- Other Terms and Conditions

Technical Specifications

			To be checked by bidder
<i>Gantry</i>	Rotation	0°-360° in either clockwise or counter clockwise direction at a variable speed with the possibility of a small angle of movement using mechanical interlocks and manual controls. Motorized with isocentric set-up.,	
	Precision	Within $\pm 1^\circ$	
	Rotation and direction	Can be controlled from the pendant	
<i>Head Assembly</i>	Shutter system	Mechanically reliable and fail-safe shutter system (fail-safe source drive)	
	Swiveling	Not less than $\pm 180^\circ$ away from the isocenter by a motor drive	
	With swing movement of source head		
	Radiation source	Loading capacity: not less than 8000 R/hr at 1 m	
Diameter: not greater than 2 cm			
Output: not less than 130 R/min at 1 m			

Technical Specifications continued . . .

			Bidder's Offer (Please check if available)
Head Assembly	Protective source housing (as per Sec. 29 of PNRI CPR Part 12 and ICRP 33)	Beam control mechanism "OFF" position: <ul style="list-style-type: none"> maximum exposure rate from leakage radiation at one meter from the source: 10 mR/hr average exposure rate from leakage radiation at one meter from the source: 2 mR/hr 	
		Beam control mechanism "ON" position: <ul style="list-style-type: none"> exposure rate from leakage radiation at one meter from the source shall not exceed 1 R/hr or 0.1% of the useful beam exposure rate 	
	Collimation system	Manually driven	
		Field size: square or rectangular treatment field of at least 5 cm x 5 cm or smaller to a maximum of 30 cm x 30 cm or bigger at the center of rotation in centimeter scale indicator	
		Equipped with an optical field light indicator for visual indication of field size	
		Equipped with manual distance and optical distance indicator for source-skin distance (SSD) up to 60-120 cm that projects an illumination scale on the patient skin and 80 cm source axis distance (SAD), isocentric with accuracy within ± 2 mm	
		Transmitted exposure rate from defining apparatus must not exceed 5% of the attenuated beam	
		Collimator rotation: preferably manual with rotational range minimum of 180° ($\pm 90^\circ$) about the beam axis at a continuously variable speed. If motorized, availability of manual operation in case of motor failure	
	Source drawer mechanism	With a motor drive mechanism that provides "ON" and "OFF" motions of source position	
		With signal lamps in both the source head and the main control station to indicate that the source is in the "ON" position	
		With capability to draw back automatically into "OFF" position by a spring force in the event of electrical power failure and to stay on the "OFF" position until reactivated from the control panel	
		With manual retraction capability when the source return mechanism fails	
	Control Console	Dual timer	
Power ON-OFF switch		key operated	
Digital timer display and set treatment time display		Either in minutes in scale of 0.01	
		Must automatically terminate the exposure after a preset time	
Reset switch to restart system			
Emergency stop button	Shuts down treatment at any time		

Technical Specifications continued . . .

		Bidder's Offer (Please check if available)	
Control Console	Treatment technique selector switch for	<ul style="list-style-type: none"> Fixed therapy Rotation arc therapy 	
	Ready for irradiation light		
	Irradiation start switch		
	Indicators for	Fault light	
		Wedge	
		Collision	
		Door interlocks	
	With capability to reset all interlocks prior to energizing the machine		
	Gantry angle display		
	Pilot lamps for	Beam ON position	
With independent battery in case of power failure for timer display only	Beam OFF position		
	Source in transit		
	220 VAC, 60 Hz		
Treatment Couch/ Patient Support Assembly	Movement	Vertical (motorized control)	
		Lateral (manual control)	
		Longitudinal (manual control)	
		With variable speed and corresponding brakes for each movement	
	Hand-controlled and capable of manual operation in the extent of motor failure with electromagnetic locking device		
	Table top rotation	±180°	
		Manually operated with index marks used to indicate when table top is in central position	
		Provided with speed control	
	Isocentric rotation	±180°	
	Must have no rails for posterior oblique field		
Must have removable plates with clear view for posterior field			
In case of power failure	Couch shall automatically lock on its current settings (not be free wheeling)		
Machine Interlock System	Locking device during radiation treatment for	Gantry	
		Collimator	
		Field size	
		Patient support assembly	
	Inclusion of external interlocks, door switches, warning lights and emergency shut-offs in the treatment room		

Technical Specifications continued . . .

			Bidder's Offer (Please check if available)
Control Mechanism	In the "ON" position	The source and beam collimating device must be accurately aligned	
	Must be capable of acting in any orientation of the housing		
	When the door to the treatment room is open	The beam control mechanism must automatically and rapidly return to the "OFF" position where it shall remain "OFF" until the door is again closed and the machine is manually reactivated from the control panel	
	It shall not be possible to switch the beam control mechanism to the "ON" position from inside the treatment room		
	Source will remain in the "OFF" position or return to "OFF" position if any emergency control switches are operated. This is accompanied by an audible alarm both inside and outside the treatment room		
Beam Stopper	Retractable	(option)	
Machine Installation	Warning lights	Automatically switch "ON" when radiation is being produced or even when the machine controls have just been set to produce radiation	
		Designed into a fail safe circuit that is tied into the interlock system so that radiation cannot be produced if any of the warning lights have burned out	
Power Requirement	220 VAC, 60 Hz		
Accessories	Shielding (lead) blocks/beam shaping blocks	All sizes and shapes including lung and kidney blocks, 5 cm thick with insert screws and nuts	
	Wedge filter	15°, 30°, 45°, 60° for all field sizes available for the above indicated angles	
	Table tray and shadow tray including attachments		
	Patient arm and leg support		
	Penumbra trimmer		
	Mechanical front and back pointers		
	One set cassette holder	Stand type or post assembly	
	Isodose curves data and charts	For various SADs and field sizes, open fields and with various wedge angles	
	Light localizing device (isocentric lights)	Ceiling/sagittal and 2 side/lateral lights; accuracy within ±1 mm	
	Water phantoms		
	Closed circuit TV monitor	With radio intercom	
Mechanical and optical distance indicator			

Technical Specifications continued . . .

			Bidder's Offer (Please check if available)
Accessories	Three (3) radiation pen dosimeters	for cobalt-60 gamma rays energy	
	Radiation level monitor	Wall-mounted	
		With visual alarm and back-up battery supply	
	One (1) survey meter	With range 0 to not less than 1000 mR/hr	
		With audible alarm	
	Radiotherapy dosemeter	With 0.60cc ionization chamber	
		With strontium-90 check source	
	Standard spare parts for five (5) years of:	5 pcs collimator bulb	
		5 pcs distance indicator bulb	
		5 pcs microswitch spring	
	One (1) pc aneroid barometer		
	One (1) pc mercury thermometer	0-50°C in 1°C increment	
	One (1) pc caliper	Parallel, sliding arm	
		With 1 cm graduation approximately 40 cm long	
Patient immobilizing strap	Complete with clamps		
Tangential breast device and breast cone			
Accessory attachment device Head rest			
	Fixed and adjustable		
Other Requirements	air-conditioning unit	split-typr	
		3-ton capacity	
		220 VAC, 60 Hz	
		with automatic voltage stabilizer, 60 Hz, 170-260 V voltage range	
	Automatic voltage stabilizer	60 Hz, 170-260 V voltage range for the whole cobalt-60 machine	
	dehumidifier	one unit	
	Two sets each of	operation and instruction manuals	
		service and installation manuals	
		maintenance manuals	
		wiring and schematic diagrams	
parts listing			

Other Terms and Conditions	To be checked by the bidder
The supplier will be responsible for delivery, installation and commissioning of the new cobalt-60 machine and for rehabilitation of the room. They must also coordinate with the hospital for the electrical power supply needs of this machine.	
<p>Source Replacement and Maintenance:</p> <ul style="list-style-type: none"> • Certification that unit manufacturer also manufactures replacement sources for the bid cobalt-60 unit. • Certification that the unit supplier has the capability to replace and install new source including disposal of old Co-60 source. Disposal shall be at no cost to the user. • Certification that the supplier has the capability for corrective and preventive maintenance of the unit • Certificate/s of training for engineers/maintenance service personnel in model offered • Certification of availability of replacement parts and repair services for the next twenty (20) years 	
The supplier must have a license to distribute and sell radioactive materials for medical use from the Philippine Nuclear Research Institute (PNRI).	
Equipment must pass the acceptance testing of the RHS, DOH as provided in the DOH AO No. 21, s. 1996 dated 04 June 1996	
Full payment must be done only after passing the acceptance testing of the Radiation Health Service (RHS), Department of Health (DOH)	
Five (5) years warranty for parts and service after passing the acceptance testing of the Radiation Health Service (RHS), Department of Health (DOH)	
Must comply with the applicable requirements for licensing by PNRI.	
Bid offer is in Philippine peso to include taxes and duties; transportation to site, delivery, installation and testing/commissioning expenses on site (hospital)	
The supplier must provide orientation training for users and maintenance personnel of the hospital	
Certificate of sole distributorship from the unit manufacturer mentioning the name of the Philippine representative	
Certification of manufacturer guaranteeing delivery of equipment and all accessories	
<p>Delivery together with the cobalt-60 unit of the following:</p> <ul style="list-style-type: none"> • One (1) pc circuit breaker • One (1) pc extension board for troubleshooting 	
The unit should conform to the International Electrotechnical Commission (IEC) standards or its equivalent.	
Certificate of Philippine Securities and Exchange Commission (SEC) registration	
The supplier must submit the original brochure.	
Inventory of spare parts for the unit/model offered duly signed by the principal	
Certification of guaranteed uptime for the equipment offered	
Supplier to submit cost of service contract for parts and service after the warranty period	
Supplier must be accredited as a supplier of x-ray equipment by the DOH Accreditation Committee for Medical Equipment.	