

**TECHNICAL SPECIFICATIONS OF 1.5 TESLA MRI MACHINE WITH STANDARD ACCESSORIES**  
**QUANTITY-01, ( DP-5)**

Ser No	Description	Tech specifications/Feature	To be filled up by the Principal/Manufacturer
(a)	(b)	(c)	(d)
1.	General Specifications: Following specifications are to be available.		
	a. Nomenclature	1.5 Tesla MRI Machine with standard accessories	
	b. Brand	To be mentioned.	
	c. Model	To be mentioned. Should be latest and upgraded version.	
	d. Name of Principal with Complete Address	To be mentioned.	
	e. Name of Manufacturer with Complete Address	To be mentioned for Main Machine/ System. Other Items/ Accessories and Local supplied item mentioned specifically.	
	f. Name of Local Agent with Complete Address	To be mentioned.	
	g. Country of Origin & Manufacture	Group-A (Bangladesh, Australia, Austria, Belgium, Brazil, Canada, Denmark, Finland, France, Germany, Indonesia, Ireland, Italy, Japan, Luxemburg, Netherlands, Norway, Singapore, South Korea, Spain, Sweden, Switzerland, Turkey, UK and USA)	
	h. Port of shipment	Same country of manufacture for Main System. Other Items/ Equipments/ Accessories and Local supplied item to be mentioned specifically.	
2.	<b>Type and Compatibility:</b> The whole-body 1.5 Tesla Magnetic Resonance (MR) imaging system for diagnostic purposes is required with the following performance criteria.		
3.	<b>Technical Specifications:</b> Following technical specifications/information are to be available.		
	<b>a. Type of Magnet:</b>		
	(1) Latest, State of the Art, Ultra Compact, Superconducting magnet with active shielding and external interference shielding.		
	(2) Magnet Weight (with cryogenics): Please specify. (Lower is preferred).		
	<b>b. Magnet Parameters:</b>		
	(1) Operating Field strength: 1.5 Tesla.		
	(2) Field Stability: <0.1 ppm/hour.		
	<b>c. Homogeneity:</b>		
	(1) Should be 1 ppm or less at 40 cm DSV (Guaranteed homogeneity).		
	(2) Homogeneity should be maintained in large FOV, fat saturation and applications like cardiac, functional MRI, diffusion tensor imaging and spectroscopy. System with the highest homogeneity to be quoted (Numerical lower value is preferred).		
	<b>d. Magnet Cooling System:</b>		
	(1) Helium Tank Capacity: To be mentioned.		
	(2) Helium boil off rate: Zero Boil off System		
	(3) Refill Time/Condition: To be mentioned.		
	<b>e. Magnet Bore:</b>		
	(1) Magnet length: To be mentioned (Lower is preferred).		
	(2) Inner diameter/Bore Opening: 70 cm or more.		



**RESTRICTED**

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	<b>f. Gradient System:</b> (1) Actively shielded (AS) whole body gradient coil system. (2) Gradient should have low eddy currents. (3) Liquid cooled coil and amplifier.		
	<b>g. Gradient Performance for Each Axis:</b> (1) Amplitude: 40 mT/m or more (2) Rise time: To be mentioned. (3) Slew rate: 200 T/m/s. ( Actual slew rate)		
	<b>h. Gradients Resolution Parameters:</b> (1) FOV: 50 cm x 50 cm x 50 cm (X, Y, Z) or more. (2) FOV for whole body Coverage: 200 cm or more. (3) Matrix: 1024 /2048 or more. (4) In Plane Resolution: 12 µm or less.		
	<b>i. RF System:</b> (1) Dual Density Signal Transfer Technology or d Stream Technology or Equivalent. (2) Receiver with High dynamic Range without adjustment. (3) Number of RF Channels: 64 or more or Channel Independent ( <b>Needs to be clarified during technical Evaluation by presentation</b> ). (4) No of integrated coil elements: 100 or more.		
	<b>k. Digital Signal Processing System:</b> (1) Frequency stability (5 min) : $\pm 2 \times 10^{-10}$ (2) Frequency control: Minimum 16 bits or more (3) <b>Transmit amplifier.</b> (a) Bandwidth: 500 KHz or more. (b) Peak power: 16 KW or more.		
	<b>l. Patient Table:</b> (1) The patient table system to be supplied and directly mounted to the magnet. (2) Scan Range: 200 cm or more. (3) Range of vertical table movement: 60 – 90 cm or better (4) Longitudinal table movement: 200 cm or more. (5) Load capacity: 200 kg or more. (6) Table side control: Both side of the Magnet (7) Dockable Table Trolley/ Transport System for Patient : Dock able Table Trolley is offered in the BOQ/BOM/List of Accessories and Country of Origin and Manufacture/Assembly to be from Group A Countries, Origin & Manufacture/Assembly specified in the technical offer. (8) Detail Picture/ Supporting catalogue with Basic Technical Informations to be submitted with the technical offer.		
	<b>m. Patient Communication and Monitoring:</b> (1) Assistance call squeeze-bulb for patient. (2) Intercom communication with the patient. (3) Volume of speaker and headphones in examination & control room for voice commands. (4) LCD monitor in the console and built in camera in the magnet for viewing the patient. (5) Physiological Measurement Unit (PMU). (6) Quantity, Brand, Model with Country of Origin, Manufacture and Assembly to be mentioned/ submitted in the List of BOQ/BOM/List of Accessories in the technical offer (without price) and financial offer (with price). (7) Detail Picture/ Supporting catalogue with Basic Technical Information's to be submitted with the technical offer regarding Patient Communication & Monitoring.		
	<b>n. RF Coils:</b> Multi element coil technology with inter connectivity between different coils for advanced application such as neurovascular imaging, whole body imaging etc (Compatible with machine). Following Coils to be supplied with the system and clearly mentioned in the technical offer (without price) as well as financial offer (with price): (1) Head Coil – 01 No (Number of Channel to be mentioned). (2) Neck Coil – 01 No (Number of Channel to be mentioned).		



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Ser No	Description	Tech specifications/Feature	To be filled up by the Principal/Manufacturer
		(3) Body Coil (Min coverage 50 cm)-01 No (Number of Channel to be mentioned).	
		(4) Spine Coil – 01 No (Number of Channel to be mentioned).	
		(5) Flexible Large Coil – 1 No (Number of Channel to be mentioned).	
		(6) Flexible Small Coil – 1 No (Number of Channel to be mentioned).	
		(7) Coil for peripheral angio or coil combination -01 No (Number of channel to be mentioned).	
		(8) Shoulder Array Coil –01 No (Number of Channel to be mentioned).	
		(9) Extremity Coil – 01 No (Number of Channel to be mentioned).	
		(10) Dedicated Breast Coil – 01 No (Number of Channel to be mentioned).	
		(11) Knee Coil – 01 No (Number of Channel to be mentioned).	
		(12) Detail Picture/Supporting catalogue of above mentioned coils to be submitted with the technical offer including Country of Origin and Manufacture.	
	<p>p. <b>Acquisition Workplace (Work Station) with Dual Computer:</b> Patient registration and pre-registration, Scanning, Reconstruction, Post-processing, Viewing, ata Storage, Filming. Minimum 01 (One) workstation for radiologist with remote connection and 01 (One) Operator Console to be required for the system. Both the work station should have full application facilities. Workstations software comes from same manufacturer. All Application Packages (Software) and Advance Application Packages (Software) to be available, compatible and driven by Work Station &amp; Host Computer. Price to be quoted separately.</p>		
	<p>(1) <b>Color LCD Monitor:</b></p>		
	(a) Screen size (diagonal): Minimum 23 inch or more.		
	(b) Screen matrix: 1900 x 1200 pixels or more.		
	(c) Required Cable, Connector with Input and Output connectivity to be provided as per requirement.		
	(d) Quantity, Brand, Model with Country of Origin, Manufacture and Assembly to be mentioned/submitted in the List of BOQ/BOM/Accessories with technical offer (without price) and financial offer (with price).		
	(e) Detail Picture/Supporting catalogue of above mentioned Monitor to be submitted with the technical offer.		
	<p>(2) <b>Host Computer Hardware:</b> Computer will be supplied along with MRI machine is a medical graded computer system. CPU, Monitor, Keyboard, Mouse and other peripheral will be made from renowned brand nominated/approved by the manufacturer of the MRI Machine. Basic configuration of Host Computer Hardware are given below:</p>		
	(a) Processor: Quad Core Intel Xeon or equivalent		
	(b) Clock rate: 3.5 GHz or Higher.		
	(c) Main Memory (RAM): Minimum 32 GB or more.		
	(d) Hard Disk: Minimum 500 GB or more.		
	(e) Keyboard and Mouse		
	(f) Required Cable, Connector with Input and Output connectivity to be provided as per requirement.		
	(g) Original/License Software and Antivirus software to be provided as per requirement.		
	(h) Media drive: CD/DVD writer/ Pendrive		
	(j) Quantity, Brand, Model with Country of Origin, Manufacture and Assembly to be mentioned/submitted in the List of BOQ/BOM/Accessories with technical offer (without price) and financial offer (with price).		
	(k) Detail Picture/ Supporting catalogue of above mentioned computer to be submitted With the technical offer.		



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Ser No	Description	Tech specifications/Feature	To be filled up by the Principal/Manufacturer
	(3) <b>Measurement and reconstruction system:</b> Computer will be supplied along with MRI machine is a medical graded computer system. CPU will be made from renowned brand nominated/approved by the manufacturer of the MRI Machine. Monitor, Keyboard, Mouse and other peripheral will be made from renowned brand .Minimum 14" x 17" additional laser printer comes with the computer system/To be supplied locally. It should have all post processing software's and complete DICOM functionalities as main console.		
	(a) Processor: Six Core or Higher Processor or equivalent.		
	(b) Clock rate: Minimum 3.5 GHz or more.		
	(c) Main Memory (RAM): Minimum 32 GB or Higher.		
	(d) Hard Disk: Not less than 720 GB.		
	(e) Parallel Scan & Recon: Simultaneous scan and reconstruction of up to 8 or more data sets		
	(f) Required Cable, Connector with Input and Output connectivity to be provided as per requirement.		
	(g) Original/License Software and Antivirus software to be provided as per requirement.		
	(h) Media drive: CD/DVD writer/ Pendrive		
	(j) Quantity, Brand, Model with Country of Origin, Manufacture and Assembly to be mentioned/submitted in the List of BOQ/BOM/Accessories with technical offer (without price) and financial offer (with price).		
	(k) Detail Picture/ Supporting catalogue of above mentioned computer to be submitted with the technical offer.		
	(4) <b>Image reconstruction speed:</b> Matrix 256 x 256, 100% FOV: 40,000 images/sec or more.		
	<b>q. Sequences &amp; Protocols: The Clinical imaging Package to be provided with full range of protocol optimized for a wide range of clinical applications in all anatomical regions with the following:</b>		
	(1) Parallel acquisition Technique, Spin Echo (Single, Double and Multi Echo), inversion recovery (IR), FLASH, FISP, PSIF, MEDIC, MPRAGE, VIBE,TSE, Echo, Sharing, Turbo IR, HASTE time of flight, Phase contrast, cc-MRA,EPI,GRE, Deffusion –Weighted, Imaging, PACE, LOTA, SPAIR, ONE GMR, Fat Excitation, Water Excitation, SPACE or <b>equivalent.</b>		
	(2) Supporting documents /catalogue of above mentioned parameter to be submitted with the technical offer.		
	r. Updated AI (Artificial Intelligence) package (upto the year of contract).		
	s. <b>Application Packages(Software):</b> Following complete application package (Software) to be provided with the System.		
	(1) <b>Neuro Package:</b> Comprehensive head and spine examinations. Should include protocols for diffusion imaging, perfusion imaging and MRI or <b>equivalent.</b>		
	(2) <b>Angio Package:</b> MR Angiography (Contrast & Non contrast) and Venography or <b>equivalent.</b> .		
	(3) <b>Cardiac Package:</b> Morphology, ventricular and valvular function, tissue characterization, coronary imaging and angiography. Visualization of structural cardiovascular pathologies with CMR. Global and regional ventricular wall motion analysis or <b>equivalent.</b>		
	(4) <b>Body Package:</b> Abdomen, Pelvis, MR colonography, MRCP, MPMR, dynamic kidney, MR Urography. Should allow multibreath-hold examinations as well as free breathing examinations or <b>equivalent.</b>		



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	(5) <b>Onco Package:</b> Visualization of pathologies, particularly metastases. Dedicated prostate protocols detection, localization and staging of tumors and recurrences or <b>equivalent.</b>		
	(6) <b>Breast Package:</b> Comprehensive breast examinations to visualize breast lesions and implant assessment. Protocols for morphology and contiguous coverage of both breast simultaneously or <b>equivalent.</b>		
	(7) <b>Ortho Package:</b> Comprehensive protocols for joint and spine imaging or <b>equivalent.</b>		
	(8) <b>Pediatric Package:</b> Special neuro and cardiac imaging protocols by age groups or <b>equivalent.</b>		
	(9) <b>Documents:</b> Supporting documents /catalogue of above mentioned parameters to be submitted with the technical offer.		
t.	<b>Advanced Application Packages (Software):</b> Following complete advanced packages (Software) to be provided with the System.		
	(1) <b>Whole Body Imaging:</b> Whole Body imaging should be automated multi-station head-to- toe coverage. Extended table stroke to increase total table travel, allowing whole-body multi-station feet-first imaging studies. Single table motion by combining all imaging sequences per station or <b>equivalent.</b>		
	(2) <b>Sound Pressure Suppressing Algorithm:</b> Should have acoustic noise reduction technologies, to achieves up to minimum 80% acoustic noise reduction without sacrificing image quality or contrast. Should be used for all scan techniques in routine exams or <b>equivalent.</b>		
	(3) Special software's to reduce susceptibility art effects in MR Conditional implants or <b>equivalent..</b>		
	(4) Spin Echo (SE); Modified Spin Echo (MSE); Fast Gradient Echo (FGRE), Inversion Recovery (IR) and mixed SE-IR or <b>equivalent..</b>		
	(5) Single-shot EPI based diffusion with ADC maps on console, perfusion with TTP color maps and functional imaging including processing (statistical maps and color overlay on anatomical images) including presentation of visual and auditory paradigm administration for MRI studies or <b>equivalent..</b>		
	(6) Proton Spectroscopy to examine metabolic changes in the brain such as tumors and degenerative diseases Integrated software package with sequences and protocols for proton 2D, 3D Chemical Shift imaging (CSI) to examine metabolic changes in the brain (e.g. Tumors and degenerative diseases) or <b>equivalent..</b>		
	(7) <b>Diffusion Tensor Imaging package:</b> To provide advanced imaging and processing methods for assessment of white matter fiber tracts in the brain. Functionalities include: Diffusion Tensor Imaging (DTI) (up to 32 directions and 16 b-values), Automatic calculation of Fractional Anisotropy (FA) maps, Visualization of the white matter tracts using fiber tracking, Advanced 3D visualization of (multiple) white matter fiber tracts, Overlays of anatomical and Bold Analysis datasets, 3D display movies of the entire white matter fiber structures, 2D cross sections of anatomical and Bold Analysis datasets, 2D color cross sections with fiber tracts, Multiple ROI fiber tracking. Statistics on voxels fibers and ROIs or <b>equivalent..</b>		
	(8) Integrated software package with sequences and protocols for non contrast enhanced 3D MRA with high spatial resolution. Particularly enabling imaging of abdominal and peripheral vessels and should be an alternative to MR angiography techniques with contrast medium, specially for patients with severe renal insufficiency or <b>equivalent..</b>		
	(9) Susceptibility Weighted Imaging for the brain with ultra-high sensitivity for microscopic magnetic field in homogeneities caused by deoxygenated blood, products of blood decomposition and microscopic iron deposits or <b>equivalent.</b>		
	(10) BOLD Imaging sequences for functional brain mapping with comprehensive processing and visualization package for real time assessment of spatial relation of eloquent cortices with cortical landmarks or brain lesions or <b>equivalent..</b>		



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	(11) Easy to use cardiac exam protocols using anatomical landmarks, 'standard views of the heart, such as easily generated and reproducible dedicated long axis .and short axis views using different scanning techniques. Scan parameters to be adjusted according to the patient's heart rate. Automatic detection of five cardiac landmarks based on the localizer images for optimal planning of the cardiac exams. Fully automatic volumetric evaluation of cardiac cine data Tight after image reconstruction. Automatic, real-time and motion corrected calculation of parametric maps. Acquisition should adapt in real time to heart rate variations for non cine applications or equivalent.																							
	(12) Compressed sensing Package should be offered.																							
	(13) MR Angio Imaging: Should have 2D/3D TOF, 2D/3D PC, MTS and TONE, ceMRA. All MRA & MRV protocols & processing software's should be offered as standard. Evaluation of flow velocity in cm/s , variable velocity encoding and global and regional flow volume should be included as standard on the main console or equivalent.																							
	(14) Bolus chasing with automatic moving table should be offered and should be available with fluoro triggered MR angiography for manual and fast switchover in less than 1 sec for ceMRA results. The system should have as standard software / technique for motion correction for involuntary head movement of the patient or equivalent.																							
	(15) The system should be quoted with fast 3D Volume acquisition sequences/package for high temporal and spatial resolution dynamic Liver imaging and also steady state sequences for abdomen imaging should be quoted as standard.																							
	(16) The system should have ASL (Arterial Spin Labeling) feature.																							
4.	a. <b>RIS/PACS Connectivity:</b> The system to be included necessary connection, image and work list send/receive, Image and Data storage, Scheduling, Patient registration, Synchronization and Reporting function as per DICOM, Standard for smooth and effective integration with RIS/PACS and H15.																							
	b. <b>Chiller (dedicated for MR) with soft starter:</b> Quantity, Brand, Model with Country of Origin, Manufacture and Assembly to be mentioned/submitted in the List of BOQ/BOM/ Accessories in the technical offer (without price). Also catalogue/supporting documents to be submitted. Price to be quoted separately. Basic technical information to be mentioned and also catalogue/ brochure to be submitted with the technical offer.																							
	c. <b>RF Cabin for shielding the magnet:</b> Quantity, Brand, Model with Country of Origin, Manufacture and Assembly to be mentioned/submitted in the List of BOQ/BOM/ Accessories in the technical offer (without price). Also catalogue/ supporting documents to be submitted. Price to be quoted separately.																							
	d. <b>Quality Standard of MRI Machine:</b> Valid US FDA & EU EC certificate submitted with the offer by the Manufacturer/Foreign Principal.																							
5.	<b>Complete BOQ/BOM.</b> All Foreign & Local supplied items to be listed separately for full range of operation of the equipment as per following table :																							
	<table border="1"> <thead> <tr> <th>Ser</th> <th>Name of item</th> <th>Brand</th> <th>Model</th> <th>Country of Origin</th> <th>Country of Manufacturer</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Ser	Name of item	Brand	Model	Country of Origin	Country of Manufacturer	Remarks																
Ser	Name of item	Brand	Model	Country of Origin	Country of Manufacturer	Remarks																		
6.	<b>Total BOQ/BOM/List of Accessories:</b> Total BOQ/BOM/List of Accessories must be submitted/ mentioned separately with the technical offer (without price) which is submitted with financial offer (with price).																							
7.	Power Supply/ Consumption: Details to be mentioned for Whole MRI System including Chiller.																							
	a. <b>Online UPS. Quantity- 01 No:</b> Suitable/Compatible True online UPS to be supplied for <b>guaranteed</b> 15 minutes backup of the whole MRI System including Chiller in case of mains power failure & fluctuation. Capacity must be higher than the Whole MRI Power requirement. Detail Specifications are given at appendix-2 of Annexure A. Price to be quoted separately.																							
	b. <b>MR Compatible ( for ventilator patients )</b> (1) Multipara meter monitor (2) Portable ventilator (3) Syringe pump (Dual channel) (4) Infusion pump (5) Patient transportable trolley (6) Portable O <sub>2</sub> cylinder with O <sub>2</sub> flow meter (All items have to be MR Compatible).																							



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Ser No	Description	Tech specifications/Feature	To be filled up by the Principal/Manufacturer
		c. 4 x 5 ton AC – with timer system.	
		d. <b>Generator. Quantity-01 No for Power Backup:</b> Suitable/Compatible Diesel Generator with sound proof Canopy and Complete with Standard Tools and Accessories to be supplied as a power backup of the whole MRI system including Chiller in case of mains power failure & fluctuation. Prime Capacity/Power Output must be higher than the Whole MRI Power requirement. Also Standby capacity/Power Output must be 10% higher than the prime power output. Detail Specifications are given at appendix-3 of Annexure A. Price to be quoted separately.	
		e. <b>Room Preparation:</b> The supplier shall undertake (as much as required) all types of alteration on including false ceiling with proper illumination at MRI area, all required electrical wiring necessary fitting & fixture with proper earthing, providing necessary air conditioning (02x 5 ton AC for gantry room & 02x 5 ton AC technical room with timer system) for the clean air, dust proofing, dehumidifying etc. In the designated room where the equipment shall be installed. Laying of separate power cable line. One self closing 10mm thickness wooden doors with proper RF shielding. Transparent glass with appropriate shielding to be installed in the window between console and machine room.	
8.	a. <b>Foreign Training:</b>		
		(1) Orientation training (Hands on) on the system 4 weeks - 01x Radiologist, 01x Radiographer.	
	b. <b>Local Training:</b>		
		(1). User/ Operational Training : 02x Radiologist ,02x Radiographer and 02x Operator for a duration of 03 weeks application training by foreign application specialist at site.	
		(2) Repair & Maintenance Training : 06x OEM Tech for 02 weeks.	
9.	<b>Books &amp; Publications:</b> Following books and publications to be supplied in English with the Equipment free of cost with CD/DVD (soft copy):		
	a. Owners/Operation manual - 03 copies (1x original & 2x photocopies).		
	b. Workshop/Repair & Maintenance/Service manual including details circuit/ schematic diagrams-03 copies (1x original & 2x photocopies)		
	c. 100% updated Master Parts catalogue/Master parts list.- 03 copies (1x original & 2x photocopies).		
	d. Complete and updated Master Spare Parts Price list of 100% - 02 x original copies.		
10.	<b>Provisional Acceptance Certificate (PAC):</b> Completion and satisfactory functioning examination of 200 (Two Hundred) patients after installation the Machine. Then the user will issue a Provisional Acceptance Certificate for the machine and will intimate with all concern.		
11.	<b>Warranty/Guaranty:</b> 07 years full warranty for whole system including consumable (if any) and all spares free of cost from official commissioning of the machine from the date of issuance inspection note (I/Note). Also same certificate will be provided by the Manufacturer/Foreign Principal during the Stage Inspection (SI)/Pre-Shipment Inspection		
12.	<b>After Sales Service Support:</b> 10 (Ten) years from the date of installation that means after warranty period, further minimum 03 (Three) years that is from 8 <sup>th</sup> year to 10 <sup>th</sup> year after sales services including periodical servicing, all spares, disposable, other materials etc and updating of Hardware & Software on requirement basis shall be provided by the supplier as per existing procedure of Armed Forces. A guarantee certificate to be provided with the technical offer by the foreign manufacturer/principal supplier and local agent both regarding spare parts supply and software up gradation from the date of installation.		
13.	<b>Comprehensive Maintenance Contract (CMC):</b> The supplier will submit a price offer for Comprehensive Maintenance Contract (CMC) for 03 (Three) years which will be applicable after the warranty period. Non stopping service shall be provided by manufacture authorized local agent/vendor. Terms & Conditions as per Government		
14.	Other feature/items not listed above but required for full range of operation of the offered MRI Machine/ System to be mentioned and supplied free of cost with main equipment by the foreign Manufacturer/Principal as well as Local Agent.		



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APPENDIX-1 OF  
ANNEX D TO  
DGDP TENDER NUMBER 216.07.477.24  
DATED: 18 MARCH 2025

**BASIC INFORMATION OF 1.5 TESLA MRI MACHINE COMPLETE WITH ACCESSORIES**

Ser	Main Equipment/ Name of Assembly/ Sub Assembly	Country of Origin	Country of Manufacture	Port of Shipment	Remarks
(a)	(b)	(c)	(d)	(e)	(f)
1.	Complete MRI Machine				
2.	Magnet				
3.	Digital Signal Processing System				
4.	RF System				
5.	RF Coils				
6.	Patient Table				
7.	Dockable Table/Patient Transport System				
8.	Patient Communication and Monitoring System				
9.	Acquisition Workplace (Work Station) with Dual Computer				
10.	-----				
11.	-----				
12.	-----				
13.	-----				
14.	-----				
15.	-----				

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**APPENDIX-2 OF  
ANNEX D TO  
DGDP TENDER NUMBER 216.07.477.24  
DATED: 18 MARCH 2025**

**TECHNICAL SPECIFICATIONS OF TRUE ONLINE UPS WITH AVR COMPLETE.**

Ser	Description	Technical Specifications	Rmks
(a)	(b)	(c)	(d)
1.	Nomenclature	True On Line UPS with AVR.	
2.	Brand	To be mentioned.	
3.	Model	To be mentioned.	
4.	Country of Origin & Manufacture: Group-A Countries (To be specified).		
5.	Name of Principal with full address: To be mentioned.		
6.	Name of Manufacturer with full address: To be mentioned.		
7.	Name of Local Agent with full address: To be mentioned.		
8.	UPS Type	True Online.	
9.	Capacity: To be mentioned. Capacity (KVA/ KW) must be higher than the Whole MRI power requirement.		
10.	Input Voltage	360 ~420 Volt.	
11.	Input Frequency	50 Hz $\pm$ 1Hz.	
12.	Output Voltage Range	380 $\pm$ 20 Volt.	
13.	Output Frequency	50 Hz.	
14.	<b>Battery</b>		
	a. Type	Maintenance Free.	
	b. Number of Battery	To be mentioned.	
	c. Voltage	To be mentioned of Each Battery.	
	d. Capacity (AH)	To be mentioned of Each Battery.	
15.	Backup time : Guaranteed 15 Minutes for full MRI System including Chiller.		
16.	Overload protection	To be available.	
17.	Output Connection : Complete DB Box for full MRI Equipment along with all peripherals.		
18.	Surge and Spike Protection	To be available.	
19.	Year of Manufacture	Not earlier than the calendar year of contract	
20.	<b>Warranty/Guaranty: 07 years</b> full warranty including all spares free of cost from official commissioning of the Online UPS from the date of issuance inspection note (I/Note) by Inspectorate of Electronics and Instrument (IE&I ). Also same certificate will be submitted with the offer by the Online UPS Manufacturer/Foreign Principal as well as Local Agent.		
21.	<b>After Sales Service Support:</b> After Warranty period, further minimum 03 (Three) years that is from 8th year to 10 <sup>th</sup> year after sales services including periodical servicing and all spares on requirement basis shall be provided by the supplier as per existing procedure of Armed Forces. <b>A guarantee certificate to be provided with the technical offer by the foreign manufacturer /principal supplier and local agent both regarding spare parts from the date of installation.</b>		

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**APPENDIX-3 OF  
ANNEX D TO  
DGDP TENDER NUMBER 216.07.477.24  
DATED: 18 MARCH 2025**

**TECHNICAL SPECIFICATIONS OF GENERATOR FOR POWER BACKUP FACILITY OF MRI MACHINE/SYSTEM.**

Ser	General Description and Specifications	Rmks
(a)	(b)	(c)
1.	<b>Nomenclature:</b> Diesel Generator (Suitable/Compatible with Whole MRI System) with sound proof Canopy and Complete with Standard Tools and Accessories.	
2.	<b>Brand and Model:</b> To be mentioned.	
3.	<b>Country of Origin:</b> Group-A Countries (To be specified).	
4.	<b>Country of Manufacturer and Assembly:</b> Group-A Countries (To be specified).	
5.	<b>Year of Production:</b> Not earlier than the calendar year of contract.	
6.	<b>Name of Principal with full address:</b> To be mentioned. With e-mail address.	
7.	<b>Name of Manufacturer with full address:</b> To be mentioned. With e-mail address.	
8.	<b>Name of the local agent with full address:</b> To be mentioned.	
9.	<b>Dimension:</b> Overall Length, Width & Height (canopied): To be mentioned.	
10.	<b>Weight.</b> (Canopied): To be mentioned.	
11.	<b>Output of the Generator.</b>	
	a. <b>Prime:</b> Minimum capacity to be mentioned. Capacity must be higher than the Whole MRI Power requirement including Chiller.	
	b. <b>Stand by:</b> Capacity to be mentioned. Capacity must be 10% higher than the prime power load.	
12.	<b>Working Condition.</b>	
	a. <b>Noise:</b> The generator has noise suppression system and able to operate in the open and in all weather condition.	
	b. <b>Canopy:</b> Generator is made of anticorrosive steel sheet and fireproof painting. Able to attenuate sound up to (maximum) db 95 at 1 meter having lockable louvers, doors. Glass windows for monitoring the meters will be provided. Fire retardant superior quality foam will be pasted inside the canopy.	
	c. <b>Mounting:</b> The generator will be mounted on its base with anti-vibration mounting.	
	d. <b>Starting System:</b> Self starter with auto provision option.	
	e. <b>Safety Feature:</b> The generator will shutdown with sound warning against over voltage, over current, over load, Low/high oil pressure over temperature etc.	
13.	<b>Engine:</b>	
	a. Name of Manufacturer/Maker.	To be mentioned.
	b. Model.	To be mentioned.
	c. Country of Origin.	Group A Countries (To be Specified).
	d. Country of Manufacturer and Assembly.	Group A Countries (To be Specified).
	e. Year of Production.	Not earlier than the calendar year of contract.
	f. Type of Engine.	4 stroke Diesel Engine.
	g. Number of Cylinders.	06 Cylinder.
	h. Bore/Stroke.	To be mentioned.
	j. Capability: Prime power is available at variable load with a load factor not exceeding 80% of prime power rating. Overload of 10% is permitted for 1 hour in every 12 hours operation.	
	k. Piston Displacement.	To be mentioned.
	l. Compression Ratio.	To be mentioned.
	m. Output power (KW) with RPM.	To be mentioned.
	n. Cooling System.	To be mentioned.
	p. Turbo charger.	To be available.
	q. Specific Fuel Consumption Liters/hour at full load; To be mentioned.	
	r. Weight of Engine.	To be mentioned.
	s. Battery Charging Facilities: Self battery charging by engine driven dynamo/ alternator.	

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Ser	General Description and Specifications	Rmks
14.	<b><u>Alternator (Generator)</u></b>	
	a. Name of Manufacturer/ Maker	To be mentioned.
	b. Model	To be mentioned.
	c. Country of Origin	Group A Countries (To be Specified).
	d. Country of Manufacturer and	Group A Countries (To be Specified).
	e. Year of Production	Not earlier than the calendar year of contract.
	f. Type	Brushless self exciting type
	g. Rated prime and standby output (KVA)	To be mentioned.
	h. Rated output voltage	To be mentioned.
	j. Frequency	To be mentioned.
	k. Number of Phases & Wires	3 Phases, 4 Wires.
	l. Power Factor (Cos $\theta$ )	To be mentioned.
	m. Enclosure	SPDP available.
	n. Ventilation	To be available.
	p. Insulation class	To be mentioned.
	q. RPM	To be mentioned.
	r. Efficiency	To be mentioned.
	s. AVR	To be available.
	t. Weight of Alternator	To be mentioned.
15.	<b><u>Control Panel.</u></b>	
	a. <b><u>Meter &amp; Gauges:</u></b> Displaying Volt, Ampere, Frequency, Fuel in Tank, Oil pressure, Running/ Operating Hour. Water Temperature, KVA, KW, RPM, Power Factor (pf) etc. are easily visible by the operator. All alarm and data logging system is available.	
	b. <b><u>Switches:</u></b> Start & Stop key/push button with auto starter available.	
16.	<b><u>Auto Transfer Switch (ATS):</u></b> Suitable/Compatible ATS to be supplied along with the Generator.	
17.	Power output Cable: Flexible type standard/adequate size 3 phase with neutral power cable will be provided with the Generator to UPS side with cable plugs/ lugs at the delivery end & adequate size power plugs/lugs at the generator end/Out let. Required Quantity: As per user requirement. Brand, RM and Current capacity to be mentioned. Cable up to the quality standard and to be from Local/ Foreign source. (Foreign Source preferable).	
18.	Tool kits: A complete set of tool kits will be provided by the supplier along with the Generator.	
19.	<b><u>Books and Publications:</u></b> Required manual will be supplied along with the Generator.	
20.	<b><u>Warranty/Guaranty:</u></b> 07 years full warranty including all spares free of cost from official commissioning of the Online UPS from the date of issuance inspection note (I/Note) by Inspectorate of Electronics and Instrument (IE&I ). Also same certificate will be submitted with the offer by the Online UPS Manufacturer/Foreign Principal as well as Local Agent.	
21.	<b><u>After Sales Service Support:</u></b> After Warranty period, further minimum 03 (Three) years that is from 8th year to 10 <sup>th</sup> year after sales services including periodical servicing and all spares on requirement basis shall be provided by the supplier as per existing procedure of Armed Forces. A guarantee certificate to be provided with the technical offer by the foreign manufacturer/principal supplier and local agent both regarding spare parts from the date of installation.	

Appx:

1. Basic Information of 1.5 T MRI Machine-01 (One) page.
2. Tech Spec for Online UPS-01 (One) page.
3. Tech Spec for Generator-02 (Two) pages.

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