

## TECHNICAL SPECIFICATIONS

### PURCHASE ORDER

#### FOR THE SUPPLY AND DELIVERY OF MRI DEVICES TO UNHCR-EGYPT

ITB/CAI/003/24

**Required Quantity: 2 Units**

1.5 T Closed MRI UNIT	
No.	Item Specifications
<b>1</b>	<b>Magnet:</b>
1.1	Configuration
1.2	Bore size (70cm)
1.3	Superconducting
1.4	Field strength, 1.5T
1.5	Homogeneity (35 or 40 cm DSV), Vrms, (guaranteed)
1.6	Homogeneity (35 or 40cm DSV), Vrms, (typical)
1.7	1-Gauss fringe field, radial/axial, m
1.8	5-Gauss fringe field, radial/axial, m
1.9	Per-patient active shimming features
1.10	Shielding against external interferences active during a scan
1.11	Least helium consumption will be preferred.
<b>2</b>	<b>Gantry:</b>

2.1	Finished (covered) gantry weight, 200kg
2.2	Finished (covered) gantry dimension (L x W x H), cm
2.3	Minimum finished bore L-R diameter, cm (closed magnet), measured at isocenter
2.4	Minimum A-P Dimension with table inserted, cm, measured at isocenter, including spine coil, but not mat
2.5	Gantry-mounted operator-controlled LCD (yes/no)
<b>3</b>	<b>Gradient:</b>
3.1	Maximum amplitude, single axis, mT/m, at least true 44mT/m or higher per each axis (offers less than this figure will be rejected)
3.2	Maximum slew rate, single axis, T/m/s, at least 200 T/m/s per each axis (offers less than this figure will be rejected) and more will be evaluated
3.3	Cooling system type
3.4	Actively shielded gradient coils
3.5	Duty-Cycle 100%, full gradient performance for long term scanning.
<b>4</b>	<b>Patient Management/Comfort:</b>
4.1	Patient cooling features
4.2	Operator call
4.3	Patient — operator intercom
4.4	Patient illumination features
4.5	Noise reduction should be included and mentioned; with music patient listening.
<b>5</b>	<b>Table:</b>
5.1	Dockable table
5.2	Table width (moving portion), cm
5.3	Table capacity (Weight)

5.4	Table vertical travel (min height — scanning height), cm
5.5	Table longitudinal movement range, cm
5.6	Motorized patient table maximum dynamic load should be mentioned
5.7	LASER light beams for accurate positioning
5.8	Facility for easy administration of contrast.
<b>6</b>	<b>RF System:</b>
6.1	RF power amplifier 15 kW or higher.
6.2	Channels (minimum, maximum configuration)
6.3	High bandwidth (not less than 1 MHz / Channel) to complement gradient system to achieve low TR/TE.
6.4	Parallel imaging features (name, image/K-space) Name1: K-space version; Name2: image (i.e., grappa: K-space, mSENSE: image)
6.5	Analog-to-digital conversion at gantry (yes/no)
6.6	Optical transmission
6.7	The number of active elements within imaging FOV will be rated, Upgrade to higher number of independent channels will be rated
6.8	Any new features or techniques with Clinical impact will be rated
<b>7</b>	<b>Coils: (Standard/Optional, # of Elements, RF Channels, Parallel Imaging Support)</b>
7.1	Designs to enhance SNR as well as parallel image compatibility should be offered (for every coil, parallel Imaging reduction factor should be stated), Coils, Higher Channels / Wider coverage will be preferable
7.2	Brain
7.3	Head
7.4	Spine

7.5	Neck
7.6	Neurovascular
7.7	Shoulder
7.8	Body/torso
7.9	Knee
7.10	Cardiac
7.11	Breast
7.12	Wrist
7.13	Foot/ankle
7.14	Others
7.15	Coil Combinations must be possible.
7.16	No. of channels as well as parallel Imaging reduction factor should be stated for coils with maximum number of channels will be rated
<b>8</b>	<b>Computer System:</b>
8.1	State of the art host computer with high internal memory with Mouse driven user interface.
8.2	CPU type
8.3	CPU memory size, MB
8.4	Reconstruction hardware
8.5	Reconstruction memory size, MB
8.6	Image storage media type
8.7	Image storage media image capacity
8.8	DICOM 3.0 classes supported (lifetime license)
8.9	Display monitor displayable area (LxW), cm

8.10	Simultaneous scan and reconstruction, (yes/no)
<b>9</b>	<b>Imaging Features:</b>
9.1	Non-contrast angiography
9.2	Plaque imaging and color analysis
9.3	Selective MRA with cylindrical-shaped saturation
9.4	Spectroscopy
9.5	Motion compensating radial techniques
9.6	Motion compensating radial techniques with parallel imaging for all regions
9.7	Brain volume Imaging
9.8	Ultra-short TE (TE < 1ms, multi-slice)
9.9	Minimum repetition time (3-D T1 spoiled gradient echo), msec
9.10	Minimum echo time, (3-D T1 spoiled gradient echo), msec
9.11	FOV (AP, RL, HF, Min to Max), cm
9.12	Min Slice thickness in 2D & 3D should be stated and will be rated.(less than 0.5mm)
9.13	Highest available Real time reconstruction images/sec (FF1 256*256)
9.14	High Acquisition / reconstruction Matrix (not less than 1024*1024)
<b>10</b>	<b>Clinical Packages and Imaging Sequences:</b>
10.1	Highest-End Clinical application advanced packages provided by the company should be quoted for Body, Pediatric, Orthopedics, Oncology and Angiography including all standard sequences.
10.2	EPI (Echo Planar imaging) in multi / single shot.
10.3	Balanced FGRE (2D and 3D) combinable with any technique.
10.4	Flow compensation ( <i>artifacts</i> of blood and CSF)

10.5	Fold -over Suppression.
10.6	Physiological Synchronization (ECG & Respiratory, VCG/PMU)
10.7	Image filters should be added.
10.8	Miscellaneous Fat suppression techniques.
10.9	All techniques of vascular imaging should be included i.e.
10.10	Inflow & Phase Contrast angiography (2D,3D, gated).
10.11	Magnetization Transfer Contrast & Maximum intensity projection
10.12	Contrast Enhanced MRA with Techniques for optimized vessel contrast and venous suppression with Time Resolved Imaging of Contrast techniques
10.13	Peripheral angio package with moving table concepts and bolus tracking.
10.14	Non-Contrast MRA techniques should be offered, for all vessels Brain.
10.15	Post processing and measurement package
10.16	VCG/PMU, Black Blood, Arrhythmia Rejection, Flow, Single '(Multi) Slice! (Single) Multi Phase
10.17	Cardiac Perfusion, First <i>Pass</i> , Late Enhancement, Viability and Myocardium Perfusion, with necessary post processing packages on second workstation.
10.18	Spectral Water-Excitation, Fat saturation without increase of repetition time TR is Preferred.
10.19	TSE with Echo Sharing, dual contrast TSE (PD+T2), can be achieved without time penalty
10.20	Post processing measurements and analysis package
10.21	Parallel MR with high reduction factors should be compatible with all offered array coils
10.22	Applications using AI will rated and prioritized
<b>11</b>	<b>Supplied Accessories:</b>

11.1	Chiller and all needed for cooling system
11.2	RF Shielding.
11.3	MRI Dual Head Injector.
11.4	MRI compatible Wheelchair.
11.5	MRI Fire Distinguisher.
11.6	MRI Trolley.
11.7	Automatic table movement.
11.8	Full system UPS
11.9	Dry laser Camera with DICOM 3.0 compliance
<b>12</b>	<b>Complete indoor site preparation for examination, equipment and control rooms</b>
<b>13</b>	<b>Power input to be 380 VAC, 50Hz</b>
<b>14</b>	<b>Warranty and Training:</b>
14.1	Warranty for 2 years including all parts of the device
14.2	Internal training of all staff working on the device in the installation site
14.3	Comprehensive training of two biomedical engineers on; operation maintenance, preventive maintenance, and quality control tests
14.4	During the warranty period, training of all users including the staff and biomedical engineers will be repeated in case of new users in the installation site
14.5	All documentation including service and troubleshooting manuals must be delivered.

<b>15</b>	<b>list of brands that would be compatible with the Egyptian system:</b>
	<p>Philips</p> <p>Siemens</p> <p>General Electric</p> <p>Canon</p> <p>Fuji/Hitachi</p>
<b>16</b>	<b>Lead delivery time;</b>
	Maximum of 6 months after signing a Purchase Order to deliver to a named location
<b>17</b>	<b>Delivery locations</b>
	<p>The hospitals that are suggested for receiving the MRIs are:</p> <ul style="list-style-type: none"> <li>• Qalyubia specialized hospital</li> <li>• Senbellawein General Hospital</li> <li>• Imbabah Hepatic Institute</li> </ul>