# *ANNEX II + III:* TECHNICAL SPECIFICATIONS + TECHNICAL OFFER

**Contract title: Supply of** MRI device **p 1 /…**

**Publication reference:** RORS00013/SBPB Vrsac/TD3-2

**Columns 1-2 should be completed by the contracting authority**

**Columns 3-4 should be completed by the tenderer**

**Column 5 is reserved for the evaluation committee**

Annex III - the contractor's technical offer

The tenderers are requested to complete the template on the next pages:

* Column 2 is completed by the contracting authority shows the required specifications (not to be modified by the tenderer),
* Column 3 is to be filled in by the tenderer and must detail what is offered (for example the words ‘compliant’ or ‘yes’ are not sufficient)
* Column 4 allows the tenderer to make comments omits proposed supply and to make eventual references to the documentation

The eventual documentation supplied should clearly indicate (highlight, mark) the models offered and the options included, if any, so that the evaluators can see the exact configuration. Offers that do not permit to identify precisely the models and the specifications may be rejected by the evaluation committee.

The offer must be clear enough to allow the evaluators to make an easy comparison between the requested specifications and the offered specifications.

| **1.**  **Item number** | **2.**  **Specifications required** | **3.**  **Specifications offered** | **4.**  **Notes, remarks,  ref to documentation** | **5.**  **Evaluation committee’s notes** |
| --- | --- | --- | --- | --- |
| **1** | **MRI Device 1 set**  **consisting of equipment with following technical specifications:**  **SUPERCONDUCTING MAGNET MIN. 1.5 T**   * Magnetic field strength: min. 1.50 T, (please specify to two decimal places) * Magnet tunnel diameter (bore size): min. 70 cm * Guaranteed min. homogeneity of the magnetic field within the volume of a sphere with a diameter of 40 cm (according to the V-RMS method in min. 24 planes): max. 0.7 ppm. * Guaranteed min. homogeneity of the magnetic field within the volume of a sphere with a diameter of 30 cm (according to the V-RMS method in min. 24 planes): max. 0.18 ppm. * Guaranteed min. homogeneity of the magnetic field within the volume of a sphere with a diameter of 20 cm (according to the V-RMS method in min. 24 planes): max. 0.07 ppm. * Edge field line (0.5 mT) in the radial plane: max. 2.65 m. * Edge field line (0.5 mT) in the axial plane: max. 4.65 m. * Magnet length (without covers): max. 175 cm * Zero-rate helium consumption regardless of system operating conditions ("Helium Free" or "Zero-Boil off" technology or "appropriate") * Minimum field of view: 50x50x50 cm.   **SYSTEM OF GRADIENTS:**   * Gradient amplitude on each axis (for max. FOV): min. 33 mT / m on the axis * Slew rate on each axis (for max. FOV): min. 120 T/m/s * Max. matrix for scanning and reconstruction min. 1024 * Min. slice thickness 2D and 3D max. 0.5 mm * Duty cycle of gradients - min. 100%   **RF SIGNAL TRANSMISSION / RECEIVING SYSTEM:**   * Digital signal processing system * RF amplifier with "solid state/water cooled" or "appropriate" technology. * RF amplifier total output power: min. 16 kW * Number of independent channels for RF reception: min. 128 or a system equipped with a fully digital RF reception path independent of the number of channels, i.e. with coils equipped with individual analog-to-digital converters (coil technology with optical output dStream, Breeze or "appropriate") * Transmitter amplitude resolution min. 16 bits * Max. dynamic reception range of min. 164 dB   **PATIENT COMFORT AND MONITORING:**   * Max. table load (including during vertical table movement): min. 227 kg. * Max. speed of longitudinal movement of the table top: min. 200 mm / s or more. * Horizontal scanning range: min. 200 cm.   **Methods to reduce patient anxiety:**   * Noise reduction. * Adjustable ventilation and indirect light in the tunnel.   **Monitoring of patients**   * Communication between patient and operator (type of intercom system)   **System for measuring physiological parameters**   * Synchronization of measurements with the physiological cycle of heart and/or respiratory motion. * ECG gating and triggering   **Additional MR compatibile table with max. table load min.227 kg, hight adjustable with coil connections**   * Table for parallel preparation of next patient for scan included in set.   **ACQUISITION AND RECONSTRUCTION CONSOLE**   * Color LCD or LED or TFT monitor with panel size: min. one 24" (inch) * High-speed processor, min. frequency 2.6 GHz. * RAM memory capacity: min. 32 GB. * Image reconstruction speed in square matrix 256 x 256, min. 64,000 reconstructed images per second at 100% FOV. * Keyboard and mouse. * Complete DICOM functionality: Send / Receive, Query / Retrieve, Storage, Commitment, Basic Print, Modality Worklist, MPPS, Structured Reports, Study Split   **SCANNING PARAMETERS:**  **Neuroimaging sequences/techniques/tools**   * dS Sense /Sense parallel imaging/ iPAT/ ASSET/ SPEEDER or "appropriate" - Parallel imaging technology, designed for fast scan time, high resolution or to reduce artifacts. May be combined with almost all existing sequences/techniques with image contrast continuity. * CLEAR or Quiet prescan normalize or PURE or PilotScan or “appropriate” * FLAIR/Flow Quantification/FAST FLAIR or “appropriate” sequence with CSF signal attenuation. * Inversion Recovery sequences * MobiTrak or "Peripheral Vascular Runoff" or "Whole-Body Dot Engine" * mFFE/3D MERGE/MEDIC or "appropraite" * MobiView/TimWhole Body Suite/M-Power or Whole Body Scanning or "appropriate" * Single-shot EPI diffusion imaging or MAGIC DWI or RESOLVE or "appropriate" * Diffusion maps: Automatic generation of diffusion coefficient maps (ADC and/or eADC) and the creation of fractional anisotropy (FA) maps allowed. * Fat Suppression Techniques - please specify * 3D post-processing: MPR, MIP, MinIP, volume representation of surfaces or volume rendering or "appropriate".. * 3D ASL or appropriate - non-contrast three-dimensional brain perfusion, with full brain coverage and automatic calculation of color maps. * "Single" and "multivoxel 1H MR" spectroscopy (2D and 3D of all anatomies) and "chemical shift imaging of all anatomies" (MAGIC, Spectroscopy Specialist or 3D CSI or "apprropriate") * An advanced "BOLD" or fMRI or"apprropriate" application * An advanced SWI/3D SWAN application that enables 3D imaging of the brain with high sensitivity allowing for improved tissue contrast * An advanced tractography method/application for evaluating white matter fiber tracts in the brain. The application shall enable diffusion imaging up to min. 128 b-vectors   **Abdominal, pelvic, prostate imaging**   * dS Sense /Sense parallel imaging/ iPAT/ ASSET/ SPEEDER or "appropriate" - Parallel imaging technology, designed for fast scan time, high resolution or to reduce artifacts. May be combined with almost all existing sequences/techniques with image contrast continuity. * Single-shot EPI diffusion imaging or MAGIC DWI or RESOLVE or "appropriate" * High Resolution Diffusion DWIBS or REVEAL or eDWI or BodyVision or "appropriate" * Automatic diffusion coefficient map generation (ADC and/or eADC) * Protocols for MRCP or "appropriate" * Imaging techniques that allow examinations with/without breath holding during scanning * Processing and calculation of hemodynamic maps, including min. Mean Transit Time (MTT), Peak Time (TTP) * BolusTrak or CareBolus or SmartPrep or “appropriate” * 3D VIBE or 3D LAVA Flex or E-THRIVE or "appropriate"   **Breast imaging**   * 3D VIBRANT or Breast Suite or BLISS   **Imaging of the musculoskeletal system:**   * High resolution 3D protocols for MRI arthrography (3D COSMIC or 3D VIBE or Balanced FFE or "appropriate" * Imaging protocols in the presence of metal prostheses or implants * Automatic calculation of T2 maps for cartilage assessment (Mapit or T2 Map or MultiEcho T2w or "appropriate".   **Angiography imaging:**   * 2D / 3D angiography with phase contrast * Visualization of arteries and veins with and without contrast medium * Black Blood Imaging or Dark Blood or "appropriate" * Time-of-flight or "appropriate"   **Cardiovascular imaging:**   * Black Blood Imaging or Dark Blood or "appropriate" * Characterization of myocardial tissue * ECG triggering and gating * Application or sequences for cardiac function studies. * Flow Analysis or Beat or Quantitative Flow or "appropriate" * Balanced FFE or non-contrast MRA or 3D TOF or "appropriate"   **RF COILS**   * Integrated coil technology that allows connecting coil elements from different coils in a single scan (Tim 4G / Gem / dStream / Atlas or equivalent) * Automatic detection by the system of all surface coils connected and viewed on the user interface or/and Automatic detection and selection by the system of coil elements in the active field of view. * Coil/Solution for head and neck examination with total number of elements/channels - min. 15 * Coil/Solution for spinal imaging with min. 40 elements/channel. Coil/Solution shall be compatible with parallel acquisition techniques. * Coil/Solution for the examination of abdomen, chest, pelvis, heart and vascular imaging with min. 20 elements/channel. Coil/Solution shall be compatible with parallel acquisition techniques. * Dedicated breast coil of min. 7 channels/elements. * Coils/Solution for musculoskeletal examination, with min. 8 channels/elements, easy to use, for the examinations of: knee, foot, ankle, long bones, wrist, shoulder, pediatric, neurological and vascular examinations. Coils/Solution shall be compatible with parallel acquisition techniques. * The system shall have a whole-body coil/solution with min.coverage of 200 cm.   **DIAGNOSTIC WORKSTATIONS (min. 2 pcs.)**   * Manufacturer-validated diagnostic station and server computer with appropriate anti-virus software and connection to diagnostic modalities (min. CT and MR) allowed of the same and other manufacturers. (total 6 pcs.) * DICOM medical monitor (12 pieces in total) with the following specifications: Color (IPS), LED or TFT or LCD, min. 24 inches, resolution: min. 1900 x 1200, contrast: min. 1000:1, brightness: min. 350 cd/m2 * Each workstation shall have the possibility of simultaneous use and availability of the following tools and features: * Multi-modality viewer for displaying CT and MR datasets * Advanced Tool designed to evaluate T1 signal. The application has to produces time to peak (TTP) and wash in/wash out rates ( Syngo MR Tissue 4D, MR T1 Perfusion or DSC Perfusion or "appropriate") * Advanced application that enables processing of brain perfusion datasets ( Syngo MR Neuro Perfusion or MR Neuro Perfusion or MR Neuro or "appropriate") * Advanced tractography aplication ( Syngo MR Tractography or MR FiberTrak or BrainView or "appropriate") * Advanced application that enhanced semi-automatic or automatic volumetric segmentation, as well as selectable oncology response criteria including standards such as RECIST 1.0, RECIST 1.1 (Syngo MR Oncology Package, MultiModality Tumor Tracking or OncoQuant or "appropriate") * An advanced application that enables the single-click assembly of datasets from multi-station acquisitions into full-field-of-view (FOV) images (syngo.MR Composing or MR MobiView or MR Moby DWI package or "appropriate") * Advanced spectroscopic analysis that automatically identifies anatomies for selection of appropriate metabolites. The application shall have appropriate ratio/algorithm and metabolic maps. (MR SpectroView or Syngo MR Spectro CSI or MR Spectroscopy or "appropriate")   **AUTOMATIC MR INJECTOR**   * Min. dual head MR injector for the injection of contrast media and saline, compatible with up to 3T magnets * Delivery allowed of a test saline injection to check the patency of the patient's vein. Use allowed of syringes with min. volume 50 ml * Flow rate in the range of min. 0.5 to 10 ml per second * Drip injection or Keep the Vein Open injection allowed * The storage of min. 40 protocols allowed * A battery-free system, i.e. a system using AC (alternating voltage/current)   **MR COMPATIBLE ANESTHESIA DEVICE**   * Anesthesia device for use in a magnetic field tested up to 1000 Gauss * It needs to be on a mobile stand, with individual brakes on each wheel * The device shall not have a hidden storage, such as drawers * Tidal volume - 20-1500 ml and more * Min. 60-minute battery operation allowed   **MR COMPATIBLE PATIENT MONITOR**   * Patient monitor with remote control, for use in a magnetic field * Patient monitor for adults, pediatric and neonatal patients with color TFT touch-sensitive screen, min. size 10 in. For use in an MRI environment. * The device shall have a battery for use in a MR environment * Vital parametars: Min. ECG, SPO2, NIBP, CO2   **MR COMPATIBLE SINGLE CHANNEL INFUSION PUMP**   * Infusion pump, compatible with a magnetic resonance imaging device * Intended for use in a MRI environment patient transport * For use in a 1.5T and 3T MRI environment * Infusion pump shall have a built-in battery with a capacity of more than 12 hours   **METAL DETECTOR**   * The device shall consist of a wall-mounted lever/rod, self-adhesive label with instructions for the floor and shall meet ACR recommendations for min. Zone 2 screening.   **ACCESSORIES**   * RF cabin intended for the offered MR device. The draft of the position of the MR system and the recommendation of the positioning of the system shall be submitted by the bidder, the construction and installation of the RF cabin according to the submitted draft shall be realized by the bidder. * Cabinet or special shelf for RF coils * A set of headsets for the technician, to be able to communicate with the radiologist, biomedical engineer, application specialist responsible for such MRI system through the communication system installed on the acquisition console. The package will also install the communications software on the acquisition console. * Patient positioning package * A mirror attached to the head coil. * Patient positioning systems * A camera and dedicated monitor placed in the patient monitoring control room that may be used for pediatric imaging, heart load examinations of patients, as well as monitoring patient preparation. * Junction box and panel for connection to the electrical network. * Air conditioning system (cooling/heating) for the technical room and with fresh air supply for the inspection room and the control room, dimensioned according to the technical specifications of the manufacturer * Magnetic resonance system connection cables. * The price shall include the service of continual monitoring of chiller operation, power outages and continual monitoring of helium consumption during the offered warranty period. * Aggregate for the protection of the MR system according to the manufacturer's specification, which ensures smooth operation of the complete MR device in the event of a power outage or breakdown in the electrical network * UPS protection devices for diagnostic workstations   **INCLUDED ASSOCIATED SERVICES**   * The offered price shall include any costs that include: complete installation and commissioning of the device, installation and connection of all offered components, all in accordance with the manufacturer's recommendation for the installation of the offered MRI system. (turnkey). * Min. 10-day training and education of staff   **IMPORTANT NOTEs**  Tender for construction of building for MRI device is published on programme site <http://www.romania-serbia.net> with detailed technical documentation including dimensions and auxiliary equipment/technical solutions. All eventually needed additional construction works and equipment necessary for installation and operation of MRI device offered by tenderer will be obligation of tenderer and each tenderer need to calculate those expenses in their financial offer (no additional payment will be authorized by Contracting Authority for this issue). This will include modification or delivery and installation of all installations, generators, compressors, chillers, HVAC, recuperators, Faradey panels or other equipment if necessary.  **All tenderers are obligatory to participate to information meeting and site visit scheduled for 14/05/2025 at 12.00. During this visit tenderers will be presented with informations regarding building to be used for installation of MRI devices including access road and doors, installations, dimensions of rooms, power outlets, Faradei plates disposition etc.**  After supply contract is signed Contractor will be able to communicate with representative of Contracting Authority, Constructions Supervisor and Technical Designers in order to modify construction process if possible within construction contract to facilitate easier installation of MRI device. |  |  |  |