

iMagerTM - 3006

MRI System 1.5T



EPCC / PRODUCTS / APPLICATION / SOFTWARE / ACCESSORIES / CONSUMABLES / SERVICES

Analytical Technologies Limited

An ISO 9001 Certified Company

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►► Standard hardware configuration (Simple)

Main components and accessories	
No.	Description
1.1	Magnet system
1.2	Gradient system
1.3	16 channels RF (Radio Frequency) system
1.4	Cooling System
1.5	Patient handling system
1.6	Patient communication system
1.7	Patient supervision TV system (CCTV)
1.8	Physiological gating system
1.9	Console system
1.10	Workstation table and chair
1.11	Accessories

Standard RF (Radio Frequency) coils	
No.	Description
1.12	Transmitting & Receiving integrated body coil
1.13	Head/Neck coil - 16
1.14	Body coil - 8
1.15	Knee coil - 8
1.16	Shoulder coil - 4
1.17	Coil accessories

►► 1. Magnet system

Magnet Parameters	
Magnet type	Superconducting
Magnetic field strength	1.5T ± 1%
Magnetic field stability	≤ 0.1ppm/h
Weight (including 100% liquid helium)	3800kg
Magnet length	157cm
System length (cover to cover)	170cm
Magnet bore diameter	605mm±5mm
Magnet scan bore length	122cm
Shielding method	Active shielding
5 Gaussian fringe field (X, Y, Z)	≤ 2.6 m × 2.6 m × 4.0m

Shimming	
Shielding methods: Passive Shimming + Active Shimming + 3D Dynamic Shimming	
Number of superconducting shim coils	20
Longest time of 3D dynamic shimming	Approx. 30 seconds
Magnetic field homogeneity (VRMS measurement method, 24 points 24 sides)	
50 cm DSV (VRMS)	≤ 0.800ppm
45cm DSV (VRMS)	≤ 0.450ppm
40cm DSV (VRMS)	≤ 0.170ppm
30cm DSV (VRMS)	≤ 0.058ppm
20cm DSV (VRMS)	≤ 0.020ppm
10cm DSV (VRMS)	≤ 0.002ppm

Magnet cooling system	
Provide 4K cold head & Liquid helium "zero" boil-off technology	
Liquid helium capacity (100% liquid helium filling)	700L
Liquid helium refilling interval ¹⁾	≥ 5 years

►► 2. Gradient system

General features	
Gradient amplifier type	Ultrafast solid-state technology
Gradient amplifier cooling type	Water cooling
Gradient coil cooling type	Water cooling
Gradient control technology	Digital real-time transmit and receive

Gradient performance	
Max. amplitude (single axis)	40mT/m
Max. Effective amplitude	69mT/m
Max. slew rate (single axis)	150T/m/s
Max. Effective slew rate	259T/m/s
Min. rise time	0.27ms
Duty cycle	100%
The technology of maximum gradient amplitude and slew rate to arrive at the same time is provided.	

Resolution parameters	
Min. 2D thickness	0.1mm
Min. 3D thickness	0.05mm
Max. FOV	50cm
Min. FOV	1cm
Maximum acquisition matrix	1024×1024

Sequences parameters	
FSE shortest TE (256 x 256 matrix)	≤ 4ms
FSE shortest TR (256 x 256 matrix)	≤ 8ms
FSE shortest TE (128 x 128 matrix)	≤ 3ms

FSE shortest TR (128 x 128 matrix)	≤ 6ms
3D GRE shortest TE (128 x 128 Matrix)	≤ 0.4ms
3D GRE shortest TR (128 x 128 matrix)	≤ 1ms
3D GRE shortest TE (256 x 256 matrix)	≤ 0.8ms
3D GRE Shortest TR (256 x256 Matrix)	≤ 1.5ms
EPI shortest TR (256 x256 matrix)	≤ 8ms
EPI shortest TE (256 x256 matrix)	≤ 3ms
EPI shortest echo spacing time (128 x 128 Matrix)	≤ 0.4ms
EPI maximum scan slice	≥ 128
EPI maximum echo chain length	≥ 512
Diffusion weighted imaging maximum b value	10000

►► 3. RF (Radio Frequency) system

General features	
Type of RF system: Digital real-time control to transmit and receive signal	
Real-time RF energy monitoring technology, include short-term and long-term accumulation monitoring.	
Transmit technology	
RF amplifier maximum power	20kW
Transmission bandwidth	550kHz
RF amplifier Cooling type	Water cooling
RF receiving technology	
Number of independent receiving channels	16
Parallel A/D working converters	16
Center frequency	63.85 MHz
Receiving bandwidth	1.6MHz
Receiving dynamic range	120dB/Hz
Maximum received signal resolution	16bit
Sampling resolution	100ns
RF receiver amplifier noise level	≤ 0.45dB

►► 4. RF (Radio Frequency) coils

Standard coils		
Head/Neck coil - 16	Channels	16
	Dimensions (L×W×H)	43cm×33cm×32cm
	Weight	5.0kg
	Applications	<ul style="list-style-type: none"> • Head imaging • Neck imaging • C-spine imaging • Head & neck MR angiography • Head & neck combined imaging • TMJ (temporomandibular joints) imaging
Body coil - 8	Channels	8
	Dimensions (L×W×H)	55cm×46cm×3.5cm
	Weight	4.6kg
	Applications	<ul style="list-style-type: none"> • Spine imaging • Thorax imaging • Cardiac imaging • Abdomen imaging • Pelvis imaging • Hip imaging • Abdomen MR angiography
Knee coil - 8	Channels	8
	Dimensions (L×W×H)	42cm×27cm×27cm
	Weight	4.9kg
	Applications	<ul style="list-style-type: none"> • High resolution knee imaging • Lower extremities joint imaging
Shoulder coil - 4	Channels	4
	Dimensions (L×W×H)	21cm×29cm×19cm
	Weight	5kg
	Applications	<ul style="list-style-type: none"> • High resolution shoulder imaging • Higher SNR and homogeneity

Optional coils ²⁾	
Head coil - 8	Channels 8
	Dimensions (L×W×H) 32cm×40cm×31cm
	Weight 4.3kg
	Applications <ul style="list-style-type: none"> • Head imaging • Head MR angiography • TMJ (temporomandibular joints) imaging
Neck coil - 8	Channels 8
	Dimensions (L×W×H) 70.5cm×42cm×31.7cm
	Weight 7kg
	Applications <ul style="list-style-type: none"> • Neck imaging • C-spine & T-spine imaging • Neck MR angiography
Hand/Wrist coil - 8	Channels 8
	Dimensions (L×W×H) 32cm×16cm×23cm
	Weight 4.6kg
	Applications High resolution hand and wrist imaging
Foot/Ankle coil - 8	Channels 8
	Dimensions (L×W×H) 37cm×30cm×32cm
	Weight 6.5kg
	Applications High resolution foot and ankle imaging
Breast coil - 8	Channels 8
	Dimensions (L×W×H) 50cm×45cm×24cm
	Weight 6.5kg
	Applications <ul style="list-style-type: none"> • High resolution breast imaging • Simultaneous imaging of both breasts • Axillar imaging elements

Large flex coil - 4	Channels	4
	Dimensions (L×W×H)	51cm×23cm×2.7cm
	Weight	1.4kg
	Applications	Imaging of large regions, such as medium to large shoulder, hip, and knee.
Small flex coil - 4	Channels	4
	Dimensions (L×W×H)	36cm×18cm×3.7cm
	Weight	0.8kg
	Applications	Imaging of small regions, such as small to medium shoulder, wrist, elbow, and ankle.
CTL Spine coil - 16	Channels	16
	Dimensions (L×W×H)	112cm×42cm×30cm
	Weight	9kg
	Applications	High resolution imaging of the whole spine

►► 5. Patient handling system

Patient table	
Patient table type	electric
Position horizontal accuracy	≤ 1mm
Patient table length	248cm
Patient table horizontal movement range	210cm
Patient table minimum height	65cm
Patient table vertical movement range	26cm
Patient table to magnet bore top distance	45cm
Patient table maximum weight load	200kg
Patient table horizontal movement maximum speed	≥ 20cm/s
Patient table control panel	Both side of patient table
Patient table display	Color LCD Monitor

Patient communication	
LED Lighting system	Inside the bore, adjustable
Ventilation system	Inside the bore, adjustable
Intercom system	Two-way intercom, adjustable
Music player system	Provided
Non-magnetic denoising headphones	Provided
Patient supervision TV system (CCTV)	Provided

Physiological gating system	
Respiratory gating	Provided
Peripheral gating	Provided
ECG gating	Provided

►► 6. Console system

Host computer	
Operating system	Windows professional (64-bit)
CPU	3.6GHz (i7, 8-core)
RAM	16 GB
Hard disk	1TB × 2
Media drives	CD/DVD drive
External storage of image data	DVD/USB
Image transmission interface	DICOM 3.0
Number of image storage (256 x 256 matrix)	Approx. 4,000,000 (256 × 256)
Image reconstruction speed (256x256, 100% FOV)	Approx. 3,300 fps

Color LCD Monitor	
Display size	23.8"
Display resolution	1920×1080

►► 7. Sequence and scanning technology

Sequence	
Spin Echo sequences	SE (Spin Echo)
	FSE (Fast Spin Echo) 2D/3D
	SSFSE (Single Shot Fast Spin Echo) 2D/3D, combined with Half-Fourier Acquisition technology, reduce the scanning time.
	IR (Inversion Recovery), STIR (Short Time Inversion Recovery) provide a good quality fat suppression imaging, FLAIR (Fluid Attenuated Inversion Recovery) combined with fat suppression technology, to provide a good quality T1 and T2 FLAIR imaging.
	DIXON (Water and Fat Separation) based on SE and FSE
Gradient Echo sequences	GRE (Gradient Echo) 2D/3D combined with Spoiled technology
	GRSCOUT can provide single & multi slices three-dimensional positioning imaging.
	GREBH (Gradient Echo with Breath Holding) 2D/3D, GREBHSP (Gradient Echo with Breath Holding with Shared Phase) 2D/3D for fast Breath Holding imaging
	GREDE (Gradient Echo with Dual Echo) 2D/3D, GREDESP (Gradient Echo with Dual Echo with Shared Phase) 2D/3D for in-phase/out of-phase imaging
	GREME (Gradient Echo with Multi Echo) 2D/3D, for high contrast T2 weighted imaging, can effectively suppress flow artifacts of CSF and blood
	b-SSFP (Balanced steady state with free precession), can provide a very high liquid signal contrast. Combined with Multi Phase technology, can applied for cardiac cine imaging with high contrast.
	IRGRE (Inversion Recovery Gradient Echo) 2D/3D, can be used for neurology imaging to increase the contrast between white matter and gray matter.
	TFE (Turbo Field Echo) 2D/3D/4D for abdominal imaging during free breathing, and fast 3D/4D dynamic contrast imaging.
	WEGRE (Water Excitation Gradient Echo) 2D/3D, can used for synovial fluid and cartilage imaging with good contrast
	TOF (Time of Flight) 2D/3D
	CEMRA (Contrast Enhanced MR Angiography) 2D/3D
	PCMRA (Phase Contrast MR Angiography)

Echo Planar sequences	EPI (Echo Planar Imaging) with Single Shot and Multi Shot technology for high definition diffusion weighted imaging.
	SEEPi (Spin Echo Planar Imaging)
	GREPI (Gradient Echo Planar Imaging)

Soft sound technology	
Soft sound is a technology to reduce the sound of scanning without image quality loss, which will provide a more comfortable scanning experience for patients.	
Application area	Optimized Silent protocols for the brain, spine and large joints
Silent sequence	SE-Silent, FSE-Silent, FLAIR-Silent, STIR-Silent, SSFSE-Silent

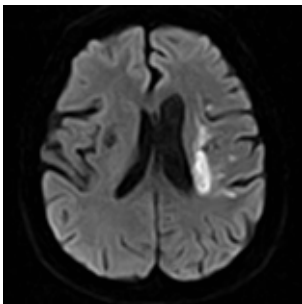
Standard fat and water imaging	
STIR (Short Time Inversion Recovery)	
FS (Fat Saturation) technology based on frequency selective RF pulses with 2 selectable modes: weak, strong	
SPAIR (Spectral Adiabatic Inversion Recovery), combined with frequency selective inversion pulse to obtain a high-quality fat suppression body imaging	
WE (Water Excitation) technology, can used for synovial fluid and cartilage imaging with good contrast	
DIXON (Water and Fat Separation) technology, available on SE and FSE sequence.	

Fast imaging technology	
Dual-engine parallel acquisition technology	SENSE (Sensitivity Encoding) technology based on Image domain
	GRAPPA (GeneRalized Auto calibrating Partially Parallel Acquisition) technology based one K-space
	Provide compatible RF coils, scan sequences and automatic calibration technology

Parallel acquisition application direction	X, Y, Z
Parallel acquisition acceleration factor	4
Artifact suppression technology	
Pre-saturation technology	RF saturation pulses to suppress flow and motion artifact.
Flow compensation technology	Can effectively compensate for image artifacts caused by liquid flow.
PROP (Periodically Rotated Overlapping Parallel) data filling technology	Improves image quality by rotated data filling in K-space to correct the effects of motion during MR sequence acquisition.
Gating technology	Use the Respiratory, ECG, and Peripheral gating to perform triggered scanning, can accurately suppress image artifacts caused by physiological motion.
Breath-hold scanning technology	Fast scanning technology combined with patient breath-holding to achieve fast breath-hold scanning, which can effectively improve the success rate of examination.

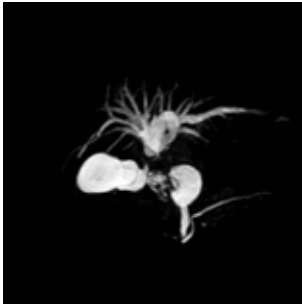
►► 8. Clinical application packages

Neurology Imaging suite



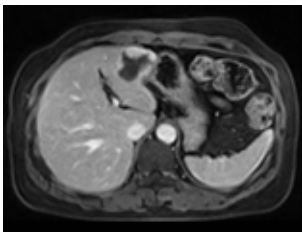
- Fast 2D&3D imaging based on SE, FSE, GRE sequence
- Diffusion imaging with multiple b-values, ADC-map, eADC-map, Diffusion Tensor Imaging with up to 12 directions³⁾
- Perfusion imaging⁴⁾
- T1-FLAIR, T2-FLAIR combined with water-fat dual suppression technology
- TOF 3D MR angiography
- TOF 2D Venography
- 3D isotropic volume imaging
- T2*-GREME 2D&3D to avoid CSF and blood flow artifacts
- Water and fat separation
- Amide Proton Transfer Imaging
- Magnetic susceptibility weighted imaging
- High definition myelography
- Whole-spine imaging

Body Imaging suite



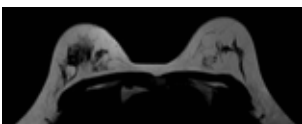
- Ultra-fast 2D&3D imaging based on SE, FSE, GRE sequence
- Diffusion imaging with multiple b-values, ADC-map, eADC-map
- Multiple Precise fat suppression technique, include STIR, FS, SPAIR
- In-phase & out-phase imaging
- Free breath scanning
- breath hold scanning
- triggered scanning
- MRCP
- MRU
- FAST 3D/4D DCE (dynamic contrast enhancement) imaging

Oncology Imaging suit



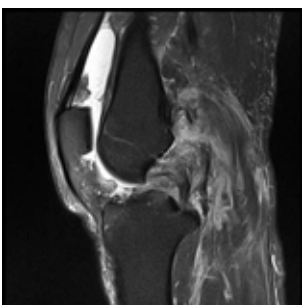
- Diffusion imaging with multiple b-values, ADC-map, eADC-map
- Multiple Precise fat suppression technique, include STIR, FS, SPAIR
- FAST 3D/4D DCE (dynamic contrast enhancement) imaging
- Time-signal curve drawing and analysis

Breast Imaging suite



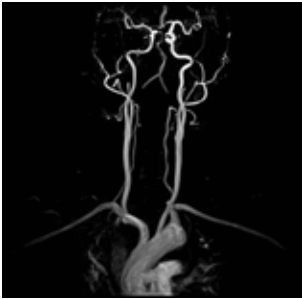
- high resolution breast structural imaging
- High resolution 2D&3D imaging based on SE, FSE, GRE sequence
- Diffusion imaging with multiple b-values, ADC-map, eADC-map
- FAST 3D/4D DCE (dynamic contrast enhancement) imaging
- Time-signal curve drawing and analysis

Orthopedics Imaging suite



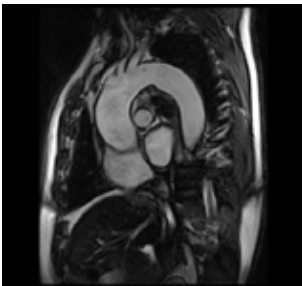
- High resolution 2D&3D imaging based on SE, FSE, GRE sequence
- off-center positions imaging
- Multiple Precise fat suppression technique, include STIR, FS, SPAIR and DIXON
- High definition 3D WE (Water excitation) imaging

Angiography Imaging suite



- TOF (Time of flight) MR angiography
- PCMRA (Phase contrast MR angiography)
- CEMRA (Contrast-enhanced MR angiography)
- MTC (Magnetization Transfer Contrast) technology and TONE (Tilted Optimized Non-saturation Excitation) pulse to improved Contrast to Noise Ratio of images
- MIP, MinIP and MPR reconstruction software

Cardiac Imaging suite (Limited)



- Cardiac cine based on b-SSFP sequence, can clearly show the structure of the heart and aorta.

1) Optional functions. To obtain more accurate image information, the Diffusion tensor imaging (DTI) analysis software (optional) and other accessories are required.

2) Optional functions. To obtain more accurate image information, the MRI perfusion analysis software (optional) and other accessories are required.

►► 9. Installation

Radio frequency shielding	
For shielding the examination room from external RF sources	
RF attenuation factor	>100dB
Frequency range	1–80MHz

Magnetic shielding⁵⁾	
For additional reduction of the magnetic fringe field, suitable iron shielding can be installed in the walls of the examination room. The room shielding can be used to create a magnetic shielding enclosure	

Power Requirements	
Line voltage	380VAC
Stability tolerances	±10%
Line frequency	50/60 Hz, ±1 Hz
Connection value	80 kVA

Power consumption	
System off	7.0kW
Stand-by	8.0kW
Typical measurement	30kW
Highest average power	70kW

Recommended dimension	
Scanning room	6.00m x 5.00m
Operation room	3.00m x 3.00m
Equipment room	3.00m x 4.00m

HPLC Servicing, Validation, Trainings and Preventive Maintenance :

HPLC Servicing :HPLC Servicing : We have team of service engineers who can attend to any make of HPLC promptly @the most affordable cost.

Trainings :We also take up preventive Maintenance to reduce downtime of HPLC's Trainings.

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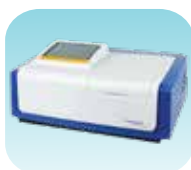
Instruments :Instruments :We offer instruments/Renting Services Modules like pumps,detector etc. on Rent.



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Chromatograph
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Spectrophotometer



Liquid Particle
Counter



Optical Emission
Spectrophotometer



DSC/TGA



Semi Auto Bio
Chemistry Analyzer



HEMA 2062
Hematology
Analyzer



Micro Plate
Reader/Washer



URINOVA 2800
Urine Analyzer



Total Organic
Carbon 3800



Fully Automated
CLIA



NOVA-2100
Chemistry Analyzer



PCR/Gradient PCR/
RTPCR



TOC
Analyzer



Laser Particle
Size Analyzer



Ion Chromatograph



Water purification
system

Regulatory compliances



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2. Improving quality of life by offering YOGA Training courses, Work shops/Seminars etc.

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