AIRIS II
Mid-Field Performance Open MR

AIRIS II. The Open MR system with the impressive technical features and consistently high image quality you have come to expect from Hitachi Open MR products and more.

HITACHI
Inspire the Next

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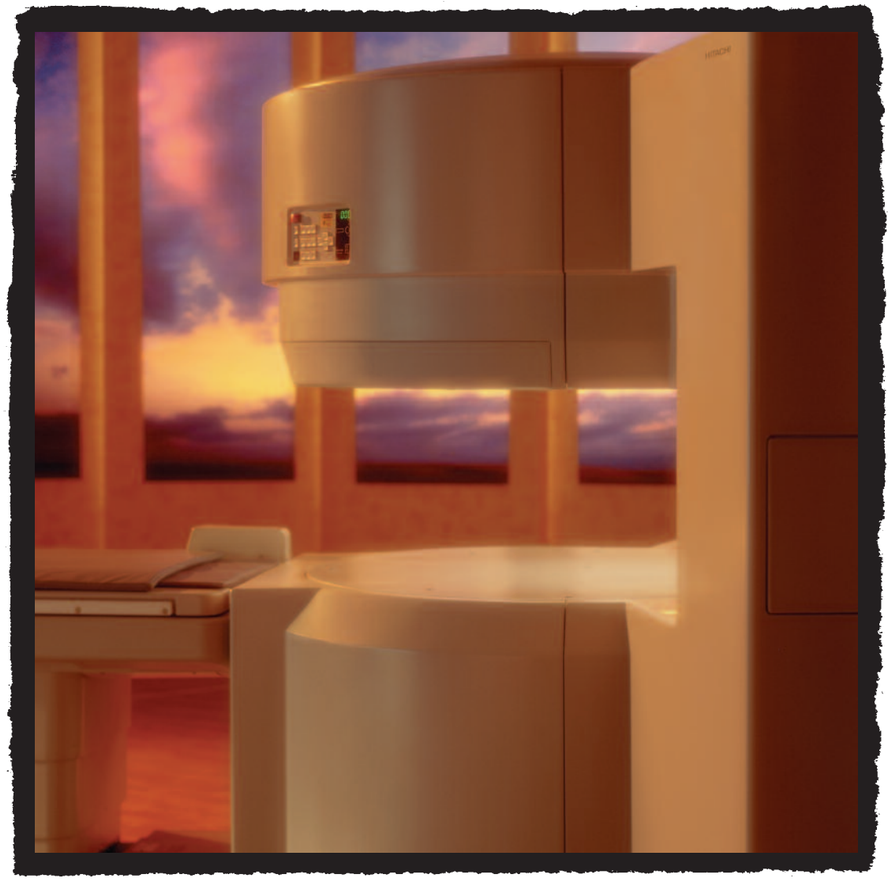
AIRIS II

Product Data



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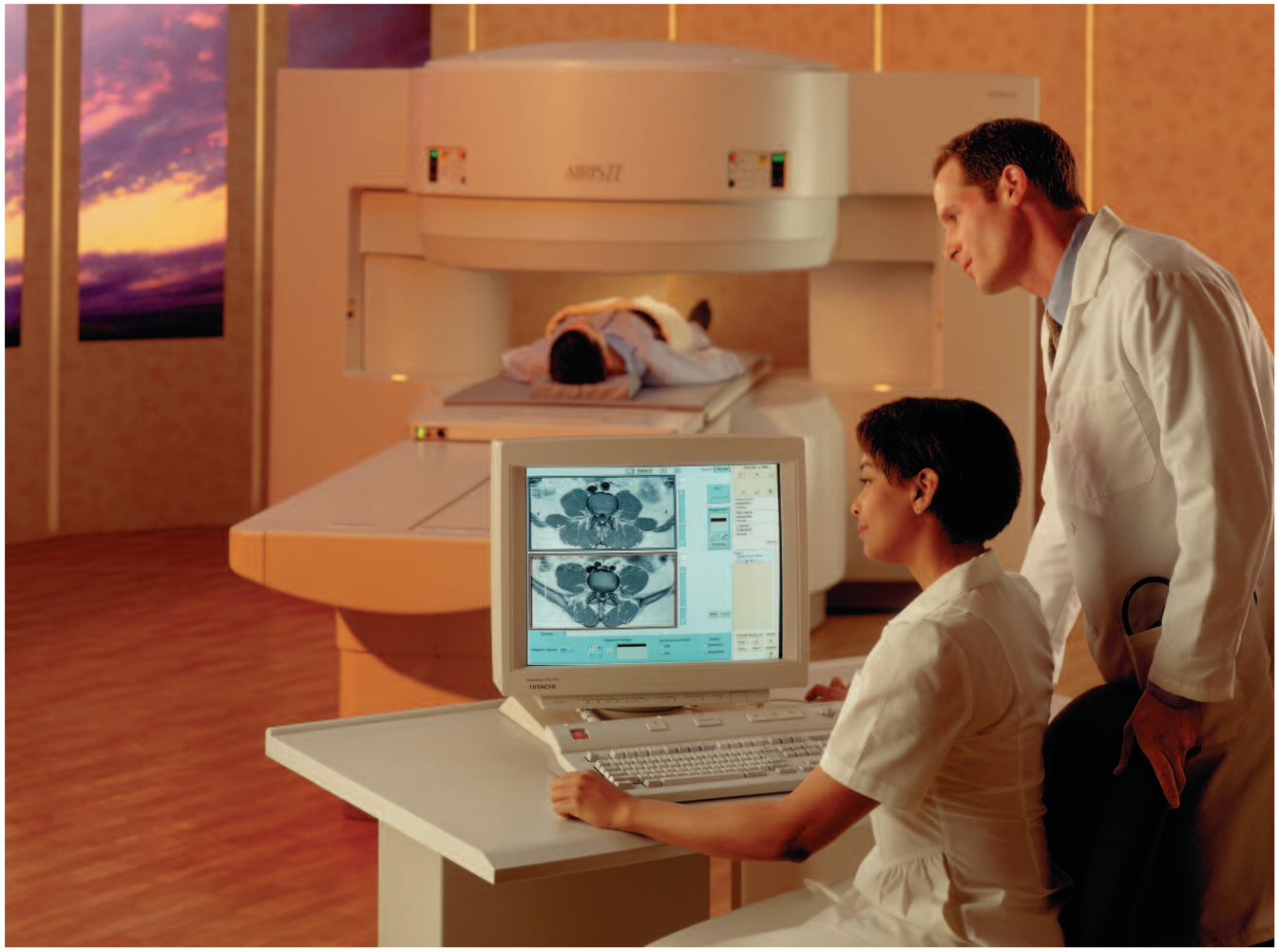
AIRIS II
Performance That Delivers

AIRIS II is the mid-field performance Open MR system that delivers high image quality using advanced clinical applications. AIRIS II's performance results from optimized subsystems: efficient gradients, a digital multiple array capable RF system and a user-friendly, multi-tasking computer workstation.

Reliable performance begins with the 0.3 Tesla, self-shielded, advanced permanent magnet design. In addition, the fast and powerful 15mT/m gradients provide thin slice imaging at small FOVs and the DualQUAD® multiple array RF system* provides high signal-to-noise and extended coverage.

Finally, the 64-bit, RISC-based workstation makes viewing and processing images efficient. With a graphical user interface, full multi-tasking environment and a large LCD color monitor, the workstation is not only easy to use but has all the functionality you need.



MAGNET SYSTEM

The AIRIS II has the famous award-winning design and reliable permanent magnet that delivers excellent whole body images with minimal site requirements.

Magnet Type	Self-shielded, permanent
Magnetic Field	Vertical
Field Strength	0.3 Tesla
Magnet Weight	34,615 lbs.
Homogeneity	±2ppm over 20cm DSV (FWHM)
Auto Shimming	Three-axis per patient
Temperature Control	Continuous electronic thermostatic control provides high magnetic field stability
5 Gauss Fringe Field	6.6 ft. lateral, 8.2 ft. vertical and longitudinal from magnet center

GRADIENT SYSTEM

Along with the eddy current free design of the AIRIS II permanent magnet, the gradient system provides submillimeter resolution, thin slices, short TEs, short inter echo spacing, and long ETLs. The efficient gradients employ Hitachi's *SoftSound* ® technology for enhanced patient comfort.

Gradient Strength	15mT/m
Slew Rate	30T/m/s
Cooling Method	Air-cooled
Acoustic Noise	< 89dBA

AIRIS II
Technology Driven Performance

Every component of the AIRIS II RF system plays an integral role in the imaging process. With the 5kW transmit amplifier and the QD transmit coil, AIRIS II achieves optimal signal uniformity over a large 42cm FOV, critical for the largest of patients and special studies. The application of solenoid, quadrature and multiple array receiver coil technology, along with the ultra-low noise preamplifier, optimizes scanning through increased signal-to-noise and coverage. With the AIRIS II, the advanced RF system enhances your opportunity for exquisite image resolution and quality.

RADIO FREQUENCY SYSTEM

The digital RF system delivers high performance from the QD transmit amplifier and QD transmit coil to the actively decoupled receiver coils, ultra-low noise preamplifier and the digital receiver with 4-channel DualQUAD multiple array technology.

Transmitter/Receiver

Frequency	12.7MHz
Transmitter Type	Digital 4-channel, quadrature design
Transmit Power	5kW (maximum)
Transmit Modulation	Digital, amplitude, frequency and phase
Detection	Linear, quadrature and multiple array
Preamp Noise Figure	0.3dB
Variable Bandwidth	Digital, automatic and manual
Prescan	Set RF power (flip angle), frequency, receiver gain/tuning

Receiver Coils

Standard
QD Open Head
QD Flex Body Notched (M)
QD Flex Body Notched (L)
QD Knee
Neck/C-Spine
Large Extremity

Supplemental*
QD Flex Body Notched (S)
QD Flex Body (XL)
QD C-Spine
Small Extremity

Specialty*
QD Wrist
Bilateral TMJ
QD or Multiple Array Shoulder
Multiple Array CTL

*Optional

COMPUTER SYSTEM AND OPERATOR CONSOLE

The AIRIS II computer system offers users an intuitive, multi-tasking environment utilizing multiple processors to facilitate pulse sequence control, data acquisition and image reconstruction and processing. The computer provides the basis of efficient, single-user operation as all functions including scanning, reconstruction, image display, processing, filming and archiving are controlled through the host computer.

Host CPU	64-bit RISC-based processor
Memory	1GB
Magnetic Disk	3.5", 9GB capacity, stores 27,000 images (256 x 256)
Optical Disk	5.25", 2.6GB (re-writable) capacity, stores 17,000 images (256 x 256)
Reconstruction Time	0.05s/image
Display Monitor	Large LCD color monitor
Display Matrix	1280 x 1024
Input	Keyboard, mouse, control panel
Laser Imager Interface	Digital, host control

PATIENT MANAGEMENT SYSTEM

The AIRIS II patient management system consists of the power-driven table and ancillary functions that enhance the comfort of the patient and facilitate ease of scanning by the operator.

Gantry Opening	43cm x 17cm x 70cm (W x H x D)
Width of Table Top	31.5" (80cm)
Vertical Movement	Power-driven, 18-30" (scan height is 30")
Lateral Movement	Power-driven, ± 4" (10cm) from midline
Longitudinal Travel Speed	Power-driven, 0.8" and 4.7" per second
Positioning	Three-plane laser light localization

Positioning Accuracy	± 1mm
Gating Ports	Integrated at end of table
Control Panels	Located at three positions around the gantry for ease of operation
Emergency Patient Access	Manual tabletop release
Weight Limit	500 lbs.

The AIRIS II computer workstation combines advanced function with ease of use. The large LCD color monitor and OpenWindows™ based graphical user interface produce a screen with an intuitive, easily navigable layout while the 64-bit, RISC-based processor performs tasks with speed and efficiency. With full multi-tasking and image reconstruction at less than 0.05s/image, patient throughput is maximized.

AIRIS II
Specifications Add Up To Performance

Advanced technology is evident in every subsystem of the AIRIS II. The AIRIS II delivers long ETL, small FOV, thin slice imaging for fast scanning with clinical accuracy and precision. The broad spectrum of pulse sequences available, from standard SE to Driven Equilibrium FSE, SARGE™, Fast FLAIR, MRCP, EPI based Diffusion-weighted Imaging and FatSep™ display the advanced capabilities of the AIRIS II. For each pulse sequence, preset acquisition parameters are provided to optimize image quality.

IMAGE ACQUISITION CAPABILITIES

The AIRIS II advanced capabilities include a wide FOV range of 5-42cm. FSE imaging flexibility with echo train lengths from 2-256. Thin slice, high-resolution imaging is enabled through the efficient 15mT/m gradient subsystem while images are reconstructed up to a 1024 x 1024 matrix by the computer system.

Field of View	5-42cm
Slice Thickness (2D,3D)	2-100mm, 0.5-5mm
Number of Slices (2D,3D); Slabs (3D)	256, 512; 32
Slice Spacing	Contiguous and user-variable
Number of Echoes	Up to 4
Signal Acquisitions	1/2, 3/4; 1-99, step 1
Variable Acquisition Matrix	64-1024 x 64-512
Imaging Planes	TRS, SAG, COR, Oblique
Oblique Imaging	Single, double, multiple-slice/multiple-angle
Off-Center FOV	Up to maximum FOV

PULSE SEQUENCES

Standard: Spin Echo (SE), Gradient Echo (GE), Inversion Recovery (IR, STIR, FLAIR)

Sequence		TR (ms)	TE (ms)	TI (ms)	Flip Angle (deg)
SE	2D	30-10000	10-250	———	3-120
SE	3D	30-10000	17-250	———	3-120
GE	2D	20-10000	5-50	———	3-90
GE	3D	20-10000	6-50	———	3-90
IR	2D	50-10000	10-250	20-8000	———

FSE: Single/Dual Contrast FSE, Fast Inversion Recovery (FIR, Fast STIR, Fast FLAIR)

Sequence		TR (ms)	TE (ms)	TI (ms)	Echo Train
FSE	2D/3D	200-16700	15-2000	———	2-256
FIR	2D/3D	200-16700	15-2000	28-8000	2-256

SARGE (SG): RF-Spoiled SARGE (RSSG) and Balanced SARGE (BASG)

Sequence		TR (ms)	TE (ms)	Flip Angle (deg)
SG, RSSG	2D	20-10000	6-50	3-90
SG, RSSG	3D	20-10000	7-50	3-90
BASG	2D	7.0-25	3.5-12.5	3-90
BASG	3D	7.8-25	3.9-12.5	3-90

MR Angiography: Time-of-Flight (TOF), TOF with RF-Spoiled SARGE (TOF/RSSG)

Sequence		TR (ms)	TE (ms)	Flip Angle (deg)
TOF, (TOF/RSSG)	2D	20-10000	5-20	3-90
TOF, (TOF/RSSG)	3D	10-10000	3.1-50	3-90

PROTOCOL ENHANCEMENTS

- Bandwidth selection: automatic and user variable
- Gating: cardiac, peripheral pulse, respiratory
- Gradient moment nulling for flow compensation
- Dual Slice imaging
- Breath-hold imaging
- Sloped Slab Profile (SSP™)
- MTC
- Presaturation pulses (up to 6)
- Multiple overlapping slabs (3D)
- Rectangular FOV
- User variable inter-echo spacing
- User variable ETL
- HR/HD reconstruction
- Half echo
- Variable flip angle
- No frequency/phase wrap
- Swap frequency, phase direction

OPERATING SYSTEM SOFTWARE

AIRIS II's system software is as easy to use as it is powerful. Prior to each patient an automatic pre-scan procedure (auto shim, set RF power, frequency, receiver gain/tuning) is performed to optimize image quality. Preset clinical studies (which consist of pulse sequences, postprocessing and filming/archiving tasks) are chosen for a patient exam, and can be performed as is or modified for each task. Tasks are software tools organized by function and linked to comprise a clinical study. Whether you prefer to use a programmed clinical study or build your own, you have the power and flexibility with the AIRIS II.

Scan Tasks
Scan protocol selection
Slice and presaturation positioning (biplanar)
Automatic display of reconstructed images
Pause/continue/abort
Multi-plane/multi-scan acquisition

Viewport Tools
Layout Functions
Preset and user variable window level/width
Comment/annotation
Multiple image display
User selectable image layout
Reference image inset

Display Functions
Multi-study view
Single and multi-image cine
Synchronous scroll
Magnify/shift
Rotate/flip/reverse

Measurement Functions
ROI (rectangular, elliptical or user-defined)
Histogram
Line profile
Mean intensity, standard deviation, max/min
Distance measure
Angle measure
Grid

3D Processing Tasks
Multiplanar Reformatting (MPR)
Perpendicular and oblique reformats
Triplanar on-screen melt-through reformats
Batch multi-slice reformats (slice number, thickness and gap)
Radial and free curve

Maximum Intensity Projection (MIP)
On-screen (triplanar selective ROI)
Batch (set number of views)
Set direction, rotation and tilt for viewing

2D Processing Tasks
Adaptive Reconstruction
Edge enhancement, smoothing, uniformity
BNR (Background Noise Reduction)
Image addition/subtraction

Analysis Tasks
Quantitative dynamic analysis
Diffusion Analysis*

Film, Archive and Network Tools
Auto/manual film
Auto/manual archive

Modality worklist*
DICOM 3.0 network interface*
Film/archive/network status

Maintenance Task Card
Quality assurance tests

*Optional

PHYSICAL SPECIFICATIONS

Standard Components	Width	Depth	Height	Weight
Gantry Unit	9'-0"	5'-10"	6'-4"	34,615 lbs.
Patient Table	2'-9"	7'-9"	3'-0"	882 lbs.
Operator Console	4'-4"	2'-10"	2'-5"	95 lbs.
MRI Unit	3'-4"	2'-7"	5'-9"	1323 lbs.
Filter Box	2'-3"	0'-11"	3'-8"	133 lbs.
Coil Storage Cabinet	5'-0"	2'-3"	4'-3"	60 lbs.

Electrical Power: 208/220/240 volt, single phase, 8KVA requirement, 3kW average