

**FUJIFILM**

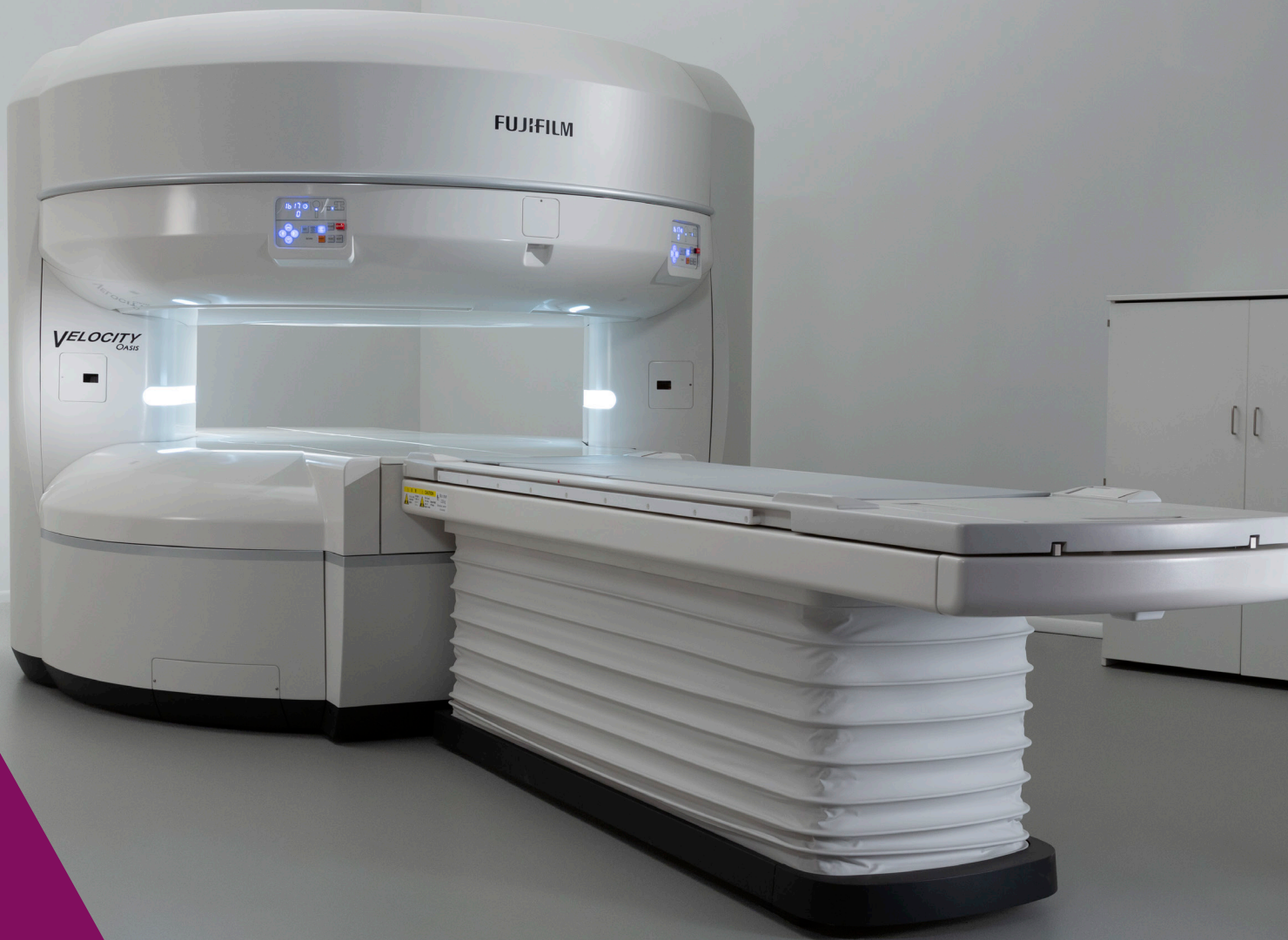
Value from Innovation

MRI

# VELOCITY

PRODUCT DATA

# OASIS



mri like no other



The Fujifilm logo is displayed in a bold, black, sans-serif font on the upper part of the MRI machine's gantry.The Velocity logo is shown in a stylized, italicized, grey font with a large 'V' at the beginning.

## Oasis Velocity from Fujifilm High Field Open MRI

Oasis Velocity is about providing the optimal combination of patient-centric care and clinical performance. Built to handle the most challenging patients, with an unobstructed viewing angle, no other MRI system enables you to capture and retain as broad of a patient demographic as Velocity.

A unique achievement in high-field imaging, Velocity's truly open architecture features an advanced magnet design, Workflow Integrated and Zenith RF Technology, along with advanced imaging capabilities to handle all patients with confidence, without compromising on performance or efficiency.

### Key Specifications

- Magnet: 1.2T Superconducting
- Homogeneity: 0.3ppm @35cm DSV
  - Shimming: Active with HOAST
  - Magnetic Shielding: Active
- Gradient System: 33mT/m and 100T/m/s
- RF System: 16 channel architecture
- RF Coils: Optimized WIT and Zenith
- Table: 660lbs (330kg) capacity



## Fully Featured High-Field Performance with Guaranteed Fujifilm Reliability.

### Magnet System

Velocity is the highest field strength, whole body vertical field magnet. Fujifilm expertise in vertical field magnet design and RF coil technology deliver outstanding image quality—with no compromise on patient comfort.

- Superconducting magnet
- Vertical field
- 1.2T field strength
- Homogeneity: 0.3ppm@35cm DSV(Vrms)
- Shimming
  - Computer-modeled passive shims placement
  - Per-patient Higher-Order Active Shim Technology (HOAST)
  - Active magnetic shielding
- 5-Gauss fringe field
  - Horizontal 4.2m (13'1")
  - Vertical 3.3m (10'9")
- Helium only cryogen
- Refill interval
  - Two years with continuous power and Fujifilm-approved maintenance

### Gradient System

Innovative Fujifilm gradient amplifiers and vertical field gradient coils provide power to scan at high spatial resolution in shortened scan times. By employing 33mT/m peak amplitude, small FOVs and thin slices can be combined, and large matrix datasets can be quickly acquired with slew rates of up to 100 T/m/sec.

- Peak amplitude: 33mT/m
- Maximum slew rate: 100T/m/s
- Active shielding
- Water cooling
- SoftSound acoustic noise reduction
  - Mechanical gradient noise dampening
  - Low noise sequences


### Radiofrequency System and Receiver Coils

The Fujifilm Zenith System is a powerful combination of multi-channel RF technology and exclusive Fujifilm Zenith RF coils. Zenith provides excellent image quality, seamless workflow, wide clinical capability and optimizes patient comfort. RAPID (Fujifilm's parallel imaging feature) reduces scan times and optimizes the clinical value of the vertical field RF coils.

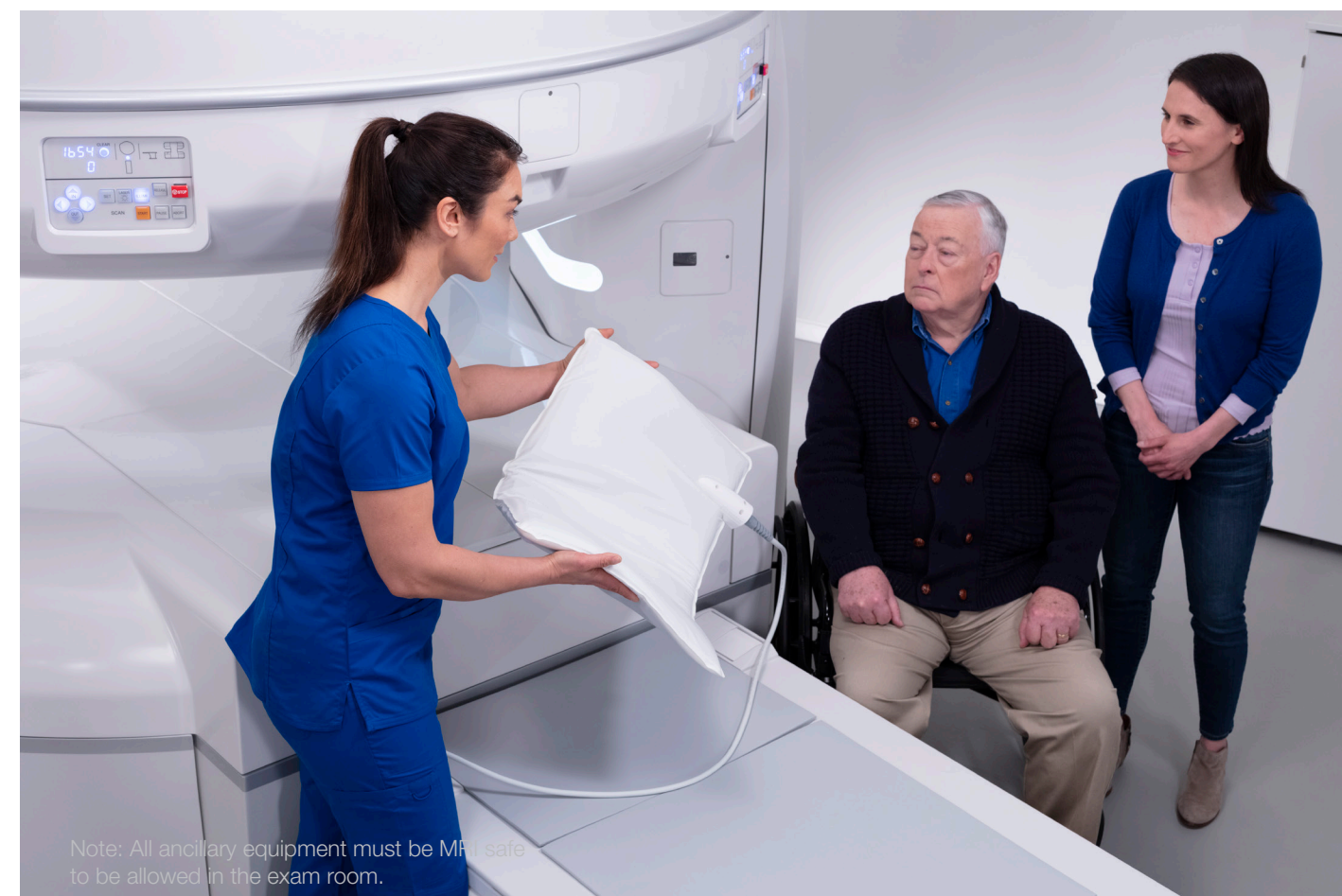
- Solid state RF transmitter
  - Peak envelope power: 18kW
- Digital receiver
  - 16 channels
  - 4 coil connection points
  - Ultra low noise preamplifiers
- Receiver coils
  - Integrated transmit/receive
  - Multipurpose
  - Micro Coil
- WIT receiver coils
  - WIT Posterior Head/Neck
  - WIT Open Head Attachment
  - WIT Whole Head Attachment
  - WIT Neck Attachment
  - WIT Blanket
  - WIT Spine
- Zenith receiver coils
  - RAPID Shoulder
  - RAPID Extremity
  - RAPID Wrist
  - RAPID Foot/Ankle
  - RAPID Breast

### Patient Management System

The arrangement of the Velocity table and gantry offers each patient an unobstructed lateral view. The patient viewing angle makes even more expansive the truly open environment. Patient area lighting and two-way communication are standard patient amenities. Four coil connection points ensure operator convenience. The 32in (83cm) wide table lowers to 20in (51cm) for easy patient access and offers power driven lateral movement at iso-center.

- |  |   |   |  |
|--|---|---|--|
| <ul style="list-style-type: none"> <li>▪ Patient aperture: 44cm</li> <li>▪ Weight limit: 660lbs (300kg)</li> <li>▪ Table width: 82cm</li> <li>▪ Table length: 252cm</li> <li>▪ Longitudinal motion: 20cm/s</li> <li>▪ Total longitudinal travel: &gt;7 ft (223 cm)</li> <li>▪ Vertical range: 50 - 89cm</li> <li>▪ Lateral range: 20cm right to left</li> <li>▪ Class II Laser Positioning                             <ul style="list-style-type: none"> <li>- +/-1mm accuracy</li> <li>- Automatic movement to iso-center</li> </ul> </li> </ul> |  | <ul style="list-style-type: none"> <li>▪ Gantry control panels                             <ul style="list-style-type: none"> <li>- Table control                                     <ul style="list-style-type: none"> <li>• Up/down</li> <li>• In/out</li> <li>• Right/left</li> <li>• Table position in mm</li> <li>• Move to iso-center control</li> <li>• Stop</li> <li>• Release</li> <li>• Laser on/off</li> <li>• Clear</li> <li>• Gantry illumination</li> </ul> </li> <li>- Scan control                                     <ul style="list-style-type: none"> <li>• Start/Abort/Pause</li> </ul> </li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>▪ Patient amenities                             <ul style="list-style-type: none"> <li>- Patient communication                                     <ul style="list-style-type: none"> <li>• Two-way intercom</li> <li>• Operator alert system</li> </ul> </li> <li>- Gantry illumination</li> <li>- Patient pads and immobilization straps</li> <li>- Emergency evacuation switch for immediate patient extraction</li> </ul> </li> </ul> |
|--|---|---|--|

## Performance



Note: All ancillary equipment must be MRI safe to be allowed in the exam room.

# Patient Focus Means Optimal, Effortless Workflow.

## Vertex II Computer System

The Velocity computer architecture integrates an advanced scan/reconstruction engine and a dual core CPU configuration. This parallel processing design provides maximum workflow and patient throughput benefits that complement the advantage patient comfort offers in keeping scans on schedule.

### CPU:

- Xeon 3.8GHz Processor
- 16 GB RAM
- Display
  - 24in LCD color monitor
  - Display matrix 1920x1200
- Magnetic disk:
  - 1TB storage capacity
  - Stores up to 400,000 images (256x256)
- DVD archive
  - Media capacity: 4.7GB
  - Stores up to 30,000 images (256x256)
  - CD/DVD writer (includes auto-launching PC viewer software)\*

### Scan/Reconstruction Engine:

- Multiple processors
- Pulse sequence control
  - Digital receiver
  - Image reconstruction
  - Post-image reconstruction
  - Simultaneous scan and reconstruction

\* Not intended for use in diagnosis

## ORIGIN MRI Operating Software

Windows® based operating software serves as a familiar environment for moving easily through demanding clinical applications and protocols. From patient registration through scan set-up to image archiving, ORIGIN mouse-driven operating software is easy to learn and use.

- Log-on security features
  - Login with password
  - Normal and Audit user privileges
  - Timeout
  - Audit log
- MRI software launcher
- Patient information management
  - Registration window
    - User-defined data fields
    - Automated study ID assignment
    - Rapid registration mode
  - Registration from HIS/RIS
  - Patient data correction feature
- Patient directory
  - Patient/study view
  - Modality Worklist Management
  - Search capability
- Patient scanning
  - Protocol library organized by anatomical groups
    - Fujifilm provided
    - User-defined protocols
  - Graphical selection
  - Exam window
    - Multiple viewports for easy setup
    - 2-point and 3-point positioning
    - Multi-angle positioning
    - Image centering function
    - Interactive scan
    - Easy sequence selection and parameter adjustment
    - Basic and advanced parameter screens
    - Preview window for quick review of completed scans
    - Independent patient windows

### Processing tasks

- Max/Min Intensity Projection (MIP/minIP)
- Multi-Planar Reconstruction (MPR)
- Vascular Volume Rendering
- Signal Intensity Ratio Map (SIR Map)
- Addition/subtraction
- T1- and T2- calculated Images
- T2 RelaxMap
- Dynamic analysis
- Perfusion analysis
- Diffusion analysis
  - Single direction analysis
  - Multi direction analysis
- ADC trace
- DWI trace
- Tensor analysis
  - Mean Diffusivity (MD)
  - Fractional Anisotropy (FA)
  - DWI trace
- Post-Reconstruction functions
  - Filtering
- Spectroscopy analysis (single and dual)

### Film, Archive, and Network Function

- Flexible filming options
- DICOM 3.0 Compliant
  - Print
  - Query/Retrieve
  - Storage
  - Storage Commitment
  - Modality Worklist Management
  - Modality Performed Procedure Step

### Image review tools

- WW/WL
- Magnify
- Pan
- ROI
- Image Rotation
- Measurement
- Cine
- Comment/Label
- Statistics

### Sentinel™ Remote Customer Support

- Remote system and cryogen monitoring
- Remote desktop
- Remote diagnostics
- Remote image review

# Comfort





# Advanced Applications. Outstanding Clinical Utility.

## Pulse Sequence and Acquisition Techniques

The powerful, cutting edge Velocity imaging architecture delivers outstanding clinical imaging benefits through the Imaging Suites. The Velocity standard Imaging Suites include a broad range of acquisition sequences, sequence enhancements, and post processing tools. Scanning and processing features are available to meet the clinical challenge in Neuro, Orthopedic, Body, Breast, Vascular, and Cardiac imaging.

## Pulse Sequences

General to advanced, the acquisition sequences you need to meet your clinical challenge.

- Spin Echo (SE)
  - Up to 4 echoes
  - RADAR™ SE—for motion compensated T1 weighted imaging
- Inversion Recovery (IR)
  - FLAIR
  - STIR
  - Magnitude and Real (Real-IR) reconstruction
- 2D/3D Fast Spin Echo (FSE)
  - Echo Factors (ETL): 2 – 256
  - User defined inter-echo time
  - User defined echo allocation
    - Centric
    - Anti-centric
    - ADA
    - Sequential
  - Single Shot FSE—ultra fast acquisition
    - Ultrahigh Echo Factor for MRCP, MRI Urography, and MRI Myelography
  - Driven Equilibrium—Increases SNR and contrast over conventional FSE without increasing TR
  - RADAR radial k-space acquisition
- primeFSE—user selectable receiver bandwidth
- isoFSE—3D isotropic acquisition (T1, T2, PD, IR)
- Fast Inversion Recovery (FIR)
  - Echo Factors: 2 - 256
  - Inversion Time: 20 - 8,000
  - Driven Equilibrium
  - primeFIR
  - Double and Triple IR Black Blood acquisitions
  - RADAR radial k-space acquisition
- 2D/3D Gradient Echo (GE) and Multi-Echo Gradient Echo
- ADAGE—combined echo imaging for high T2\* contrast
- 3D GEIR—combined with an IR pulse for an isotropic acquisition
- TIGRE™—3D T1 weighted volume gradient echo with RF fat saturation
- FatSep 2D/3D
- 2D/3D Steady-State Acquisition Rewound Gradient Echo (SARGE or SG)
  - RF-Spoiled SG (RSSG)—provides T1 weighted imaging
  - Rephased SG—flow compensation for reduced artifacts
  - Balanced SG (BASG)—provides high SNR and bright fluids
    - RF fat saturation
    - RADAR radial k-space acquisition
  - Phase-cycled fat suppression cardiac imaging
  - Time Reversed SG (TRSG)—T2 weighted fluoro acquisition
- Diffusion Weighted Imaging (DWI)
  - Single Shot SE EPI
    - B-Factor: 0 - 2,000
    - RF fat saturation
    - IR pulse
- Diffusion Tensor—up to 21 axes
- BSI (3D multi-shot gradient echo EPI)
  - Contrast from tissue susceptibility differences
- 2D/3D TOF
- FLUTE™—fluoro triggered MRA
- TRAQ™—time resolved MRA
- Phase Contrast MRA (PC-MRA)
  - Velocity encode: 5 - 400cm/sec, increment 1cm/sec
- Non-Contrast MRA
  - VASC™ (BASG sequence for patients with renal insufficiency)
  - VASC ASL (arterial spin labeling method)
  - VASC FSE (gated acquisition)
- Fast Scanning
  - IP-RAPID
    - IP-Scan—Sparse data sampling technique
    - IP-Recon—Hybrid iterative processing technique
  - AutoExam Brain

## Acquisition Features and Protocol Enhancements

Scan fast and deliver excellent results using these pulse sequence enhancements and features designed to minimize artifacts and increase ease-of-use.

- Image plane selection
  - Transverse, Sagittal, and Coronal
  - Single and Double Oblique
  - Multi-slice, Multi-angle
  - Radial for simplified MRCP, Knee acquisition planning
  - Multi-plane for combined Sagittal, Coronal, Axial acquisition (SC, SCA, CA, or SA)
  - Interactive Scan Control (I-Scan) enables efficient imaging plane selection and real-time image collection with slice position and scan parameter change and update during MRI Fluoro acquisition
  - AutoPose: Automatic slice planning for brain imaging
- Prescan
  - RF power adjustment
  - Center frequency
  - Volume shim adjust
- User defined regional shim
- Motion compensation
  - RADAR radial acquisition (FSE, FIR, FLAIR, SE, primeFSE, BASG)
  - Gradient rephasing
  - Presaturation pulses-up to eight
  - Walking presaturation
  - Cardiac gating with arrhythmia rejection
  - Peripheral Pulse Gating with arrhythmia rejection
  - Respiratory gating
  - Diaphragm Navigation Echo
  - Intermittent presaturation
- Fat suppression techniques
  - SINC RF fat saturation
  - H-SINC RF fat saturation (Light mode for lipid only, Heavy mode for lipid and olefinic suppression)
  - FatSep
  - Water Excitation (Binomial technique)
  - STIR, Fast STIR (FIR)
  - In/out of phase GE
- User defined variable bandwidth
- Dual Slice acquisition
- Rectangular Field of View
- Anti-aliasing
- User defined inter-echo spacing
- Half Scan and 3/4 scan
- Half Echo
- Asymmetric Measurement Imaging (AMI)
- Real-time image quality indicator (relative SNR, CNR)
- Real-time spatial resolution update shows impact of parameter changes prior to scanning
- Image centering: Places center of prescribed slab at magnet iso-center automatically for best image quality
- Auto voice
- NATURAL™ image quality enhancement algorithm
- Dynamic scan time table window provides graphical review of dynamic scan procedure (steps and timing) for easy and efficient study planning

## Imaging Parameters

Velocity subsystems deliver outstanding performance. 1.2T field strength, powerful gradients, and the Zenith RF electronics allow sub-millimeter slice thicknesses and short echo and inter-echo times.

- Slice thickness
  - 2D: 0.7 - 100mm
  - 3D: 0.05 - 5mm
- FOV: 5 - 45cm
- TR
  - FSE: 200 - 20,000msec
  - RSSG: 1.4 - 10,000msec
- TE
  - FSE: 5.4 - 120msec
  - RSSG: 0.6 - 50msec
- Inter-echo time (IET)
  - FSE: 5.4 - 30msec
  - EPI-DWI: 0.45 - 7msec
- Flip angle (FA)
  - SE: 3 - 120
  - GE: 3 - 90
- Signals averaged: 1 - 99
- 3D multi-slab: 32
- Maximum number of 2D slices
  - 256 (512 x 512)
- Maximum number of 3D slices
  - 512 (512 x 512)
- Acquisition matrices
  - Up to 1024 x 1024
- Reconstruction matrices
  - 2048 x 2048
  - Flexible Recon Matrix

## Cost Effective Installation. Flexible Design Options.

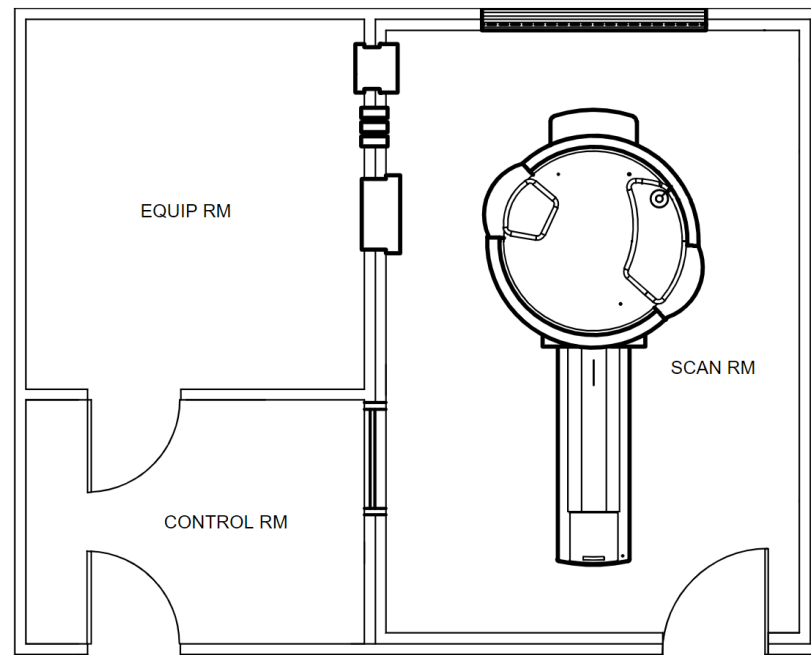
A Velocity installation in a new space or as a replacement system is addressed with easy siting requirements. In the typical floor plan of a conventional 1.5T imager, Velocity may require only a small amount of additional magnetic shielding, depending on the scan room dimensions.

### Component Dimensions

- Gantry
  - Length: 2730mm
  - Width: 2535mm
  - Height: 2410mm
  - Weight: 14,200kgs
- Patient table
  - Length: 2520mm
  - Width: 820mm
  - Height: 509mm
- Computer
  - QWERTY keyboard
  - 2-button scroll mouse
  - CPU Tower
  - Intercom
  - 24in. LCD monitor
- Gradient Amplifier Cabinet
  - Depth: 945mm
  - Width: 665mm
  - Height: 1880mm
- IRCP unit
  - Depth: 800mm
  - Width: 597mm
  - Height: 1890mm
- SENSE unit
  - Depth: 604mm
  - Width: 171mm
  - Height: 1152mm
- Helium compressor
  - Depth: 588mm
  - Width: 450mm
  - Height: 591mm

### Siting Considerations

- RF-shielded scan room
  - RF noise <0dB $\mu$ V/m from 10-70 MHz
- Air conditioning
  - Scan room
    - Ambient operating temp: 20-24°C (68 - 75°F)
    - Max. allowable temp change: 2.5°C/hr
  - Equipment and Control rooms
    - Ambient operating temp: 20-28°C (68 - 82°F)
- AC power
  - Voltage
    - 3-phase AC 480V (60Hz)
  - Frequency 60 Hz +/- 1% or less
  - Capacity 75 kVA
- Typical room size
  - Scan room
    - 23'8" x 16'6" (7.2m x 5.0m)
    - Min. ceiling height: 8'11" (2.7m)
  - Equipment room
    - 12'10" x 13'2" (3.9m x 4.0m)
    - Minimum ceiling height: 8' (2.4m)
  - Control room
    - 12'10" x 9'3" (3.9m x 2.8m)
    - Minimum ceiling height: 8' (2.4m)
- 5-Gauss line magnetic leakage flux
  - Horizontal: 4.2m (radial)
  - Vertical: 3.3m (axial)



## Expand your Fujifilm Ownership Experience

Fujifilm offers a wide range of IT, DR, MRI, CT, Ultrasound, Mammography, Endoscopy, and Endosurgery solutions, each delivering excellent diagnostic quality, lower dose, positive patient experience, and value over the life of the product. With periodic software and application training updates and a 99% uptime guarantee (with warranty and full service contract), you can be sure Fujifilm is with you every step of the way.



Flexible



Fujifilm reserves the right to change specifications described herein without prior notice. This document provides general technical descriptions of both optional and standard features.

FUJIFILM Healthcare Americas Corporation  
81 Hartwell Avenue, Suite 300, Lexington, MA 02421  
www.fujifilm.com 800.431.1850  
©2021 FUJIFILM Healthcare Americas Corporation

**FUJIFILM**  
Value from Innovation