GE Healthcare

Signa® HDx 3.0T

Technical Data

imagination at work

Contents

Signa HDx 3.0T

If you're looking for a 3.0T MRI system to accommodate today's comprehensive range of clinical applications, as well as position your facility for the future, look no further: The Signa HDx 3.0T scanner is designed to deliver outstanding performance today and for many years to come.

Whether you choose an 8-, 16- or 32-channel configuration, this system will give you instant access to GE's leading edge capabilities – including our proven 3.0T compact magnet, powerful high-fidelity gradients, high-performance computing platform, and exclusive HDx technology. The result is superb image quality, combined with uncompromised performance and workflow for today's most demanding researchers and clinicians.

Signa HDx 3.0T System Overview

Clinical Leadership

Powered by GE signature applications such as PROPELLER, TRICKS-XV, LAVA-XV and VIBRANT-XV, the Signa HDx 3.0T MR scanner improves your diagnostic confidence for even the most difficult of patients. It raises the bar on 3.0T imaging, delivering new levels of clinical performance, and quick and accurate results across all applications.

Leading Edge Hardware

HDx performance starts with extraordinary hardware including:

- A 3rd generation, high homogeneity, short-bore magnet with 18 superconducting shim coils
- A high fidelity HDx gradient platform delivering unmatched TR, TE and ESP performance
- A modular 8-, 16- or 32-channel receive chain that takes full advantage of GE's low noise quadrature architecture and high density coils
- The latest in reconstruction power – XVRE volume reconstruction – providing four times the reconstructing power of today's industry standards

Signa HDx 3.0T delivers outstanding results across all applications, including advanced, data intensive and highly accelerated techniques made possible by the inherent signal-to-noise (SNR) benefits of 3.0T.

A New Era in SAR Management

Over a dozen years' experience with high field SAR optimization has enabled GE to overcome the RF heating challenges often associated with 3.0T imaging. Employing a synergistic approach towards SAR management, including RF coil design, pulse sequence optimization and real-time digital RF power monitoring, the Signa HDx 3.0T delivers high performance, clinically relevant protocols across all applications.

Workflow and Ease of Use

Advances in MR technology should not translate into increased complexity. With its intuitive point-and-click user interface, detachable table and unique acquisition approaches to maximize the success of every exam, Signa HDx 3.0T delivers quick and accurate results patient after patient.

A Total Partnership

When you choose the Signa HDx 3.0T, you get more than just the finest MR scanner available. You also get the full support of GE Healthcare, from training and service to obsolescence protection – proven protection, demonstrated by the fact that 3.0T Signa systems installed as far back as the early 1990s have been upgraded to today's state-of-the-art performance levels.

Signa HDx 3.0T – Your System of Choice

Patient Environment

A patient's first impression of a system can have a major impact on the success of a procedure. That's why the Signa HDx 3.0T with its compact 1.89 m length (with enclosures), has been designed to put patients at ease. Once inside its spacious 60 cm bore, your patients will appreciate the in-bore lighting and ventilation system. And once the MR procedure has commenced, they will value GE's exclusive Quiet Technology, which makes MR imaging as quiet and comfortable as possible with no compromise in pulse sequence performance.

Patient Transport: Safety *and* Ease of Use

With the Signa HDx 3.0T, there's no need to tie up the scan room with patient preparation. Thanks to its detachable mobile table – easily operated by a single technologist – your staff can scan one patient while preparing the next.

The detachable table isn't just about productivity. It's also about safety. When emergency extraction is required, it takes less than 30 seconds to transport a patient from inside the magnet to outside of the scan room, eliminating the need for 3.0T compatible emergency equipment.

Operator Scanning Experience

The Signa HDx 3.0T computer architecture minimizes the delays often associated with conventional MRI. Built on a parallel, multiprocessor design, it enables simultaneous scanning, reconstruction, filming, archiving, networking and post-processing – ideal for both clinical and research environments.

This inherent speed is complemented by a number of workflow simplifications, including:

- A high-definition, wide-screen monitor that consolidates the MR procedure from prescription through image review and post-processing, into a simple and single user interface.
- HDx gating, equipping your technologists with a simple lead-placement algorithm that ensures 99% gating accuracy, even in the challenging 3.0T environment.
- HDx ProtoCopy, for click-of-the-mouse downloading of complete exam protocols from other systems into the protocol database.
- AutoVoice to ensure consistent, repeatable breath-holding instruction.
- SmartPrescan, delivering system optimization for consistent image quality without the need for repetitive and unnecessary scan set-up time.

Patient Bore	
Patient bore (L x W x H)	105 cm x 60 cm x 60 cm
Laser alignments	Axial, sagittal and coronal reference planes
Patient bore	Dual Flared
Lighting	In-bore
Table and scanner controls	Dual sided
Patient entry	Feet first or head first

Patient Transport	
Patient table	Completely detachable
Additional table	Optional
Patient table height	68.58 cm (27 in.) to 96.52 cm (38 in.) continuous
Patient table drive	Automated, power driven vertical and longitudinal
Longitudinal speed (fast)	10.26 cm/sec (4.03 in./sec)
Longitudinal speed (slow)	1.29 cm/sec (0.51 in./sec)
Vertical speed	2.58 cm/sec (1.02 in./sec)
Total cradle length	213.4 cm (84 in.)
Total cradle travel	244 cm (96.25 in.)
Scanning range	193.9 cm (76.34 in.)
Positioning accuracy	± 0.05 cm (± 0.0019 in.)
Maximum patient weight for scanning	159 kg (350 lbs.)

The 3.0T Magnet

The Cornerstone of Uncompromised MRI

When it comes to image quality and applications flexibility, no other component of an MRI system has a greater impact than the magnet. The Signa HDx 3.0T magnet utilizes a unique internal structure that enables a dramatic increase in the quantity of superconducting wire without a corresponding increase in the size of the external magnet. The resulting high density of active elements yields the largest imaging volume and highest homogeneity of any compact 3.0T scanner.

High Homogeneity Guaranteed

High homogeneity is guaranteed – our 3.0T magnet provides excellent results even in:

- Large FOV imaging up to 45 cm (X) x 45 cm (Y) x 48 cm (Z)
- Off-center FOV imaging
- Fat saturation techniques
- Demanding applications such as cardiac, fMRI, diffusion tensor and spectroscopy

Magnet Homogeneity	
Diametrical Spherical Volume (DSV)	**Typical Homogeneity***
10 cm	0.03 ppm Vrms
20 cm	0.05 ppm Vrms
30 cm	0.10 ppm Vrms
40 cm	0.25 ppm Vrms

*Based on a 24 plane, 24 point measurement

A New Level of Shimming

The Signa HDx 3.0T comes standard with both linear as well as high order shim sets, minimizing the effects of patient induced inhomogeneities.

This results in improved homogeneity for optimized image quality especially in techniques such as spectroscopy, Diffusion Tensor (DT) and Diffusion-Weighted Echoplanar Imaging (DW-EPI), breast and cardiac applications.

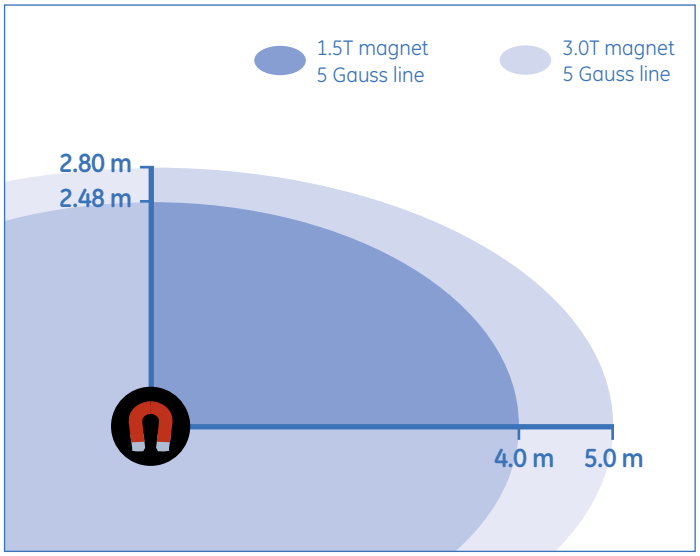
Shim Terms	
Linear	**2nd Order**
X	XY
Y	XZ
Z	YZ
	$X^2–Y^2$
	Z^2

Easy Siting, Affordable Operation

The Signa HDx 3.0T magnet is among the most compact available. Its fringe field is the smallest in the industry – comparable to that of a 1.5T system. And its ceiling-height requirements and weight are among the lowest in the industry. Complemented by GE's robust active shielding, the Signa HDx 3.0T scanner can be sited almost anywhere.

Magnet Specifications	
Operating field strength	3.0 Tesla
Operating frequency	127.7 MHz
Shim coils	18 super-conducting
Magnet shielding	Active
EMI	97%
Size (W x L)	2.06 m x 1.72 m
Enclosure length	1.89 m
Magnet weight	9,525 kg with cryogens
Magnet cooling	Cryogenic
Temporal field stability	< 0.1 ppm/hour
Long-term stability	< 0.1 ppm/hour over 24-hour period
Cryogen refill period	Approximately 4 years
Boil-off rate	< 0.03 liters/hour
Fringe field – 5 Gauss	5.0 m x 2.8 m (Axial x Radial) (16.4 ft. x 9.19 ft.)
Fringe field – 1 Gauss	7.4 m x 4.4 m (Axial x Radial) (24.28 ft. x 14.43 ft.)
Manufacturer	GE Healthcare

Fringe Field: 3.0T vs. 1.5T



Gradient System

High-Fidelity, High-Performance Gradients

Signa HDx 3.0T gradients deliver the accuracy and reproducibility you need to ensure top-quality results across all applications and all pulse sequences.

The advantages become especially apparent in acquisitions demanding high spatial and temporal resolution and in rigorous applications such as Echoplanar (EPI) and Diffusion Tensor (DT) imaging. The HDx combines high gradient amplitudes and slew rates with 100% duty cycles – the best simultaneous slew rate and amplitude performance in the industry – assuring you of optimized contrast, SNR and scan time for any exam.

Your high-end 3.0T applications will benefit from being able to switch between Zoom and Whole Body modes, eliminating the amplitude and slew rate compromise that is encountered in large FOV imaging. Zoom mode is particularly useful for achieving high resolution, high SNR results in ultra-fast cardiovascular and neuro-vascular imaging; Whole Body mode, for ensuring high quality images in even the most demanding off-center orthopedic applications.

Gradient Specifications		
	Zoom	Whole Body
Maximum integrated error*	225 uA·S	250 uA·S
Shot-to-shot*	20 uA·S	25 uA·S
Cycle-to-cycle*	30 uA·S	35 uA·S
Symmetry error*	85 uA·S	90 uA·S
Maximum gradient amplitude in each orthogonal plane	50 mT/m	23 mT/m
Maximum effective gradient amplitude	87 mT/m	39 mT/m
Rise time to max amplitude (microsec)	267	287
Maximum gradient slew rate	150 T/m/s	80 T/m/s
Maximum Imaging FOV	44 cm (X, Y) x 35 cm (Z)	45 cm (X, Y) x 48 cm (Z)

*Typical gradient fidelity, measured in micro-Amperes-second (uAs), is derived from the following measurements: Maximum Error is the maximum integrated current error over a full-scale, echo-planar gradient waveform. Shot-to-Shot is the largest difference between integrated errors across waveforms. Cycle-to-Cycle is the largest integral current error between any two epi waveforms. Symmetry Error is the largest difference in integrated current error when comparing positive and negative gradient waveforms.

Low Acoustic Noise: Quiet Technology

Acoustic noise scales with field strength and can represent a major challenge at 3.0T.

The Signa HDx 3.0T overcomes this with GE's exclusive Quiet Technology™ reducing acoustic noise to the low levels associated with imaging at 1.5T. Its features include a vacuum design that completely eliminates the need for derating gradient amplitude or duty cycle, resulting in increased patient compliance with no compromise in pulse sequence performance.

Uncompromised 3.0T Imaging: PERFORM SAR Management

At 3.0T, staying within FDA- and IEC-mandated guidelines for Specific Absorption Rate (SAR) can potentially limit the ability to scan efficiently.

Leveraging over a dozen years' 3.0T experience, GE has overcome these limitations on the Signa HDx 3.0T with an exclusive new SAR management system called PERFORM. Using a synergistic approach to SAR management, including RF coil design, pulse sequence optimization, unique preparation pulses and real-time digital RF power monitoring, Signa HDx 3.0T delivers high performance with clinically relevant protocols across all applications.

The results include faster exams, improved productivity, increased patient comfort and improved diagnostic results, scan after scan, patient after patient.

Computing Power and Data Management

MRI's fastest growing applications tend to be the most data intensive. And evolving applications that depend on unique k-space trajectories and acceleration techniques further increase the volumes of raw data generated in a single MR scan.

Far from being overwhelmed by these massive data sets, the Signa HDx 3.0T has been designed to help you manage and benefit from these trends.

Technical Specifications	
Main CPU	• Dual AMD® Opteron™ 250 (2.4 GHz) processors • PCI-express x16 graphics • 1 GHz AMD HyperTransport • 1 MB full-speed L2 advanced transfer cache
Word size	64 Bit
Host memory	4 GB ECC DDR 400 (12.8 GB/sec with processor integrated memory controller)
Graphics subsystem	Main Display: NVIDIA® Quadro® FX 1400 • 128 MB DDR graphics memory at 19.2 GB/sec • ProE-03: 51.27 • UGS-04: 29.36 • 3ds Max-03: 35.61
Cabinets	Single, tower configuration
Disk subsystem	• System Disk: ▪ 36 GB, 15,000 RPM ▪ Ultra 320 SCSI • Data Disk: ▪ 72 GB (2-36 GB), 15,000 RPM ▪ Ultra 320 SCSI, Raid 0 • Dual-channel ultra 320 SCSI controller • 400,000 uncompressed 256 x 256 image files • Maximum data rates 150 MB/s
Network	3x Gigabit (10/100/1000) Ethernet ports

Display

Your Signa HDx 3.0T scanner also comes standard with a state-of-the-art, wide-screen HD (high definition) monitor. The monitor features:

- 23 in. wide-screen (16:9) LCD flat panel
- 1920 x 1200 dot resolution
- Non-interlaced, flicker-free presentation
- Contrast ratio 500:1
- 92 kHz horizontal deflection frequency, 85 Hz refresh rate
- Digital DVI interface

Filming

Image filming features on the Signa HDx 3.0T include:

- Drag and drop filming
- One-button print series
- One-button print page
- Multi-image formats include 1:1, 2:1, 4:1, 6:1, 9:1, 12:1, 15:1, 16:1, 20:1, 25:1 and 35 mm slide
- DICOM 3.0 basic grayscale print service class
- Color printing

Archiving

Standard MOD drive
Maxoptix™ erasable, rewritable media
1.3 or 2.3 GB unformatted
DICOM 3.0 format image file and protocol file storage/retrieval
Stores up to 15,000 (for 1.3 GB) or 30,000 (for 2.3 GB) loss-less JPEG compressed 256 x 256 images per MOD
Offline retrieval of image and scan files

DVD Interchange
DVD-RW
Data transfer rate 21.6 MB/s
Access speed – average random stroke approx. 200 ms
Average 35,000 images per 4.7 GB DVD

Networking and DICOM Compliance

Our optional Performed Procedure Step (PPS) feature automatically notifies your HIS/RIS and PACS of procedure status, closing the loop from patient arrival through billing.

The system generates images that adhere to the 2004 version of the DICOM compliance standard. Please refer to the DICOM Conformance Statement located at *http://www.ge.com/dicom* and the IHE Integration Statement for the HDx product line for further details.

Objects created by the system include:

- MR images
- Secondary capture images (grayscale and color)
- Grayscale Softcopy Presentation State (GSPS)
- Structured reports

Additional supported objects:

- CT images
- PET images
- RT structure set
- GEMS PET raw information
- MOD, CD-R and DVD-R for DICOM interchange

Transactions Supported as a Storage Class User (SCU) or Store Class Provider (SCP)
DICOM store with storage commit (SCU)
DICOM store (SCU/SCP)
DICOM modality worklist (SCU)
DICOM performed procedure step (SCU)
DICOM query retrieve (SCU/SCP)
DICOM print (grayscale and color) (SCU)
Basic application level confidentiality profile as a de-identifier

Technical Profiles
Scheduled workflow with the following options. • Patient-based worklist query • Broad worklist query • Assisted-acquisition protocol setting
Patient information reconciliation
Simple image and numeric report
Consistent presentation of images

Transmit, Receiver and Image Reconstruction

Signa HDx 3.0T scalable RF architecture easily accommodates 8-, 16-, or 32-channel 3.0T configurations.

Standard RF Transmit Architecture	
RF amplifier	Air cooled, small footprint
Maximum output power	35 kW body, 4 kW head
Maximum RF field	> 24 uT
Transmit gain	> 100 dB (30 dB course/ 84 dB instantaneous)
RF exciter frequency range	128 ± 0.6 MHz
Amplitude control	16 bit with 50 ns resolution
Frequency resolution	< 0.6 Hz/step
Phase resolution	< 0.1 degrees/step
Amplitude stability	< 0.1 dB (5 min)
Phase stability	< 1.2 degrees (5 min)
Frequency stability	1 part per billion (5 min)
Digital RF pulse control	2 amplitude modulators, 2 frequency or phase modulators

Optional Multi-Nuclear RF Transmit Architecture	
Maximum output power	8 kW or 4 kW options
Broadband RF exciter range	10-130 MHz
Amplitude control	16 bit with 50 ns resolution
Frequency resolution	< 0.6 Hz/step
Phase resolution	< 0.1 degrees/step

Standard Receive Chain Architecture	
Receive channels	8 (std.), 16 or 32 (optional)
Analog to digital converters	8 (std.), 16 or 32 (optional)
Receive chain noise figure	< 0.8 dB nominal (includes switches, receivers, preamps)
Sampling rate	1 MHz @ 16 bits per channel
ADC sampling resolution	16 bit with 50 ns alignment
Receive signal filtering/decimation	Digital, non-recursive, linear FIR
Quadrature demodulation	Digital
Receiver dynamic range	> 145 dB/Hz
Receive signal resolution	Up to 32 bits
System pre-amplifiers*	10 with 28 dB gain
Pre-amplifier noise figure	< 0.5 dB

*This value represents the base system pre-amplifier configuration. Additional pre-amplifliers are provided with the purchase of optional multi-channel coils.

Reconstruction

The Signa HDx 3.0T features a powerful volume reconstruction engine (XVRE) that enables virtually real-time image generation, even when massive parallel imaging datasets are involved. Delivering four times the reconstructing capacity of industry standards, the Signa HDx 3.0T reconstruction engine features massive onboard memory and local raw data storage.

XVRE Reconstruction Engine (4 blade)
8 x 2.6 GHz AMD Opteron 252 CPUs
32 GB ECC DDR 400 RAM (12.8 GB/sec with processor integrated memory controller)
8 x 73 GB hard disk storage
1 GHz AMD HyperTransport
1 MB full-speed L2 advanced transfer cache
10 Gbps Infiniband backbone
1.0 Gbps Ethernet image transfer
5400 2D FFTs per second (full FOV, 256 x 256 matrix)

RF Coils and Arrays

The RF architecture of the Signa HDx 3.0T scanner comes standard with an 8-quadrature channel design and optional 16- and 32-channel configurations. It provides compatibility with surface coils developed by GE as well as from other vendors.

GE surface coils are developed to provide uncompromised image quality and optimized coverage. Coverage is maintained while providing high-density arrays focused around the anatomy of interest to guarantee the highest image quality.

The scanner comes with a split-top, transmit/receive head coil as standard. Optional coils are shown here.

29-Element Head, Neck and Spine Array

- 16-channel, 29-element phased array design:
  - 12-element brain
  - 16-element NV
  - 5-element anterior neck
  - 8-element thoracic-lumbar spine
- Brain, neck and spine imaging
- Optimized for parallel imaging techniques
- 3 separate coils that may be plugged in simultaneously
- 90 cm S-I coverage

HD Brain Array

- 8-channel, 8-element patient-friendly and phased array design
- Optimized for parallel imaging techniques
- Compatible with fMRI stimulus hardware
- 24 cm S-I coverage

HD NV Array

- 8-channel, 12-element phased array design
- Optimized for parallel imaging techniques
- 45 cm S-I coverage

HD CTL Array

- 8-channel, 14-element phased array design
- Whole spine imaging
- 75 cm S-I coverage

HD Torso Array

- 8-channel, 8-element phased array design
- Optimized for parallel imaging techniques
- 40 cm S-I coverage

HD Breast Array

- 8-channel, 8-element phased array design
- Optimized for parallel imaging techniques
- Biopsy compatible for both medical and lateral approaches
- PURE compatible

HD Cardiac Array

- 8-channel, 8-element phased array design
- Optimized for parallel imaging techniques performed in double oblique scan planes
- 34 cm S-I coverage

HD Shoulder Array

- 3-channel, 3-element phased array design
- Optimized for off-center imaging
- Homogenous imaging FOV and robust fat saturation
- PURE compatible

HD Knee Array

- 8-channel, 9-element phased array design
- Transmit/receive design reduces aliasing artifacts
- PURE compatible
- Optimized for parallel imaging techniques

Foot/Knee Coil

- Transmit/receive single channel multi-purpose coil.
- Flexible positioning
- High uniformity and SNR

GP Flex Coil

- Receive-only, multi-purpose coil
- Flexible positioning

Wrist Coil

- Quadrature birdcage, transmit/receive design
- 10 cm inner diameter affords high SNR
- High-resolution hand and wrist imaging

Endorectal Coil

- Compatible with HD Torso Array
- Flexible design

Imaging Performance

The Signa HDx 3.0T is the only 3.0T scanner to offer a complete portfolio of clinical applications. It positions you to conduct a full range of routine and advanced procedures, to enhance throughput, revenues, and – most importantly – the diagnostic confidence of your physicians.

Scan Parameters

The Signa HDx 3.0T's unique architecture optimizes transmission, gradient pulse play-out and RF amplifier performance study after study. It routinely achieves the highest pulse sequence performance specifications to produce uniformly excellent SNR, spatial and temporal resolution.

General System Slice Thickness and FOV Specifications	
Minimum slice thickness in 2D	0.5 mm
Minimum slice thickness in 3D	0.1 mm
Minimum FOV	10 mm (1 cm)
Maximum FOV	480 mm (48 cm)
Minimum and maximum imaging matrix	64 – 1024

- 0.5 mm minimum slice thickness
- 4 cm minimum FOV
- 1 shot minimum
- 10,000 s/mm^2 maximum b value
- 150 maximum tensor directions

EPI - Zoom Mode			
	64 x 64	128 x 128	256 x 256
Shortest TR	4.0 ms	5.0 ms	5.0 ms
Shortest TE	1.0 ms	1.1 ms	1.4 ms
ESP at 25 cm FOV	0.412 ms	0.632 ms	1.032 ms
ESP at 48 cm FOV	0.292 ms	0.412 ms	0.584 ms
ESP at 99 cm FOV	0.208 ms	0.296 ms	0.572 ms
Maximum images/sec	35	24	10

- 0.7 mm minimum slice thickness
- 1 cm minimum FOV

2D Fast Gradient Echo – Zoom Mode		
	128 x 128	256 x 256
Shortest TR	2.2 ms	2.6 ms
Shortest TE	0.8 ms	0.9 ms

- 0.1 mm minimum slice thickness
- 1 cm minimum FOV

3D Fast Gradient Echo – Zoom Mode		
	128 x 128	256 x 256
Shortest TR	0.9 ms	1.2 ms
Shortest TE	0.3 ms	0.5 ms

- 0.5 mm minimum slice thickness

2D Spin Echo – Zoom Mode		
	128 x 128	256 x 256
Shortest TR	7.0 ms	7.0 ms
Shortest TE	2.5 ms	2.5 ms

- 0.3 mm minimum slice thickness
- 1 cm minimum FOV
- 2.5 ms minimum echo spacing
- Maximum echo train length: 262

Fast Spin Echo – Zoom Mode		
	128 x 128	256 x 256
Shortest TR	10.0 ms	10.0 ms
Shortest TE	2.5 ms	2.5 ms

Signa HDx 3.0T ScanTools

Signa HDx 3.0T ScanTools is provided as standard on your system and provides a comprehensive set of pulse sequences and applications optimized for 3.0T performance.

Multi-Purpose Functionality	
Fast Spin Echo (FSE)	
Uses echo-train technology to reduce scan acquisition times	• Builds on Spin Echo, the gold standard for T1, proton density and T2 imaging • Minimizes T2 blurring with very short echo spacings
Fast Recovery Fast Spin Echo (FRFSE) and FRFSE-XL	
High-quality, high-speed, high-contrast T2-weighted imaging	• Ideal for neurological, body, orthopedic and pediatric applications • Gives operator shorter acquisition times, increased slice coverage and improved contrast when compared with conventional FSE
VERSE	
GE-unique and innovative approach for reducing SAR with FSE and FRFSE families	• Reduces SAR by up to 60% when compared with conventional techniques • Superior image quality and T2 contrast compared with non-VERSE approach • Uncompromised scan parameter selection and slice coverage
Single Shot Fast Spin Echo (SSFSE) and Enhanced MRCP	
Ultra-fast acquisition within a single TR	• Acquires slices in less than one second • Excellent for T2-weighted brain and abdominal scans • Ideal for MR Cholangio-Pancreatography (MRCP)
MART	
GE-unique and innovative approach for reducing SAR with SSFSE pulse sequences	• Reduces SAR by up to 60% when compared with conventional techniques • Reduces ESPs for further image quality improvements
Gradient Echo (GRE)	
Quick T1- or T2-weighted imaging	• Gradient Echo (GRE) • Fast Gradient Echo (FGRE) • Spoiled Gradient Echo (SPGR) • Fast Spoiled Gradient Echo (FSPGR) • Ultra-short TRs and TEs ensure performance needed for top-quality vascular imaging
Dual Echo Gradient Echo	
Outstanding abdominal imaging	• Acquires two sets of images within a single breath-hold to capture both fat and water in- and out-of-phase TEs • Perfect slice registration for more accurate abdominal evaluations
Spectral Inversion at Lipids (SPECIAL)	
High-performance fat saturation	• Spectral spatial inversion recovery pulse sequence • Optimized fat suppression to be used in conjunction with GRE and SPGR approaches
i-Drive Pro	
Real-time interactive imaging	• Allows user to change scan parameters on the fly while evaluating real-time imaging results • Especially useful for organs subject to motion artifacts such as heart, diaphragm and GI tract, or when timing of contrast boluses is required

Additional Body Functionality	
HD LAVA (Liver Acquisition with Volume Acceleration)	
An enhanced 3D spoiled gradient echo technique that enables state-of-the-art, contrast-enhanced, breath-hold dynamic liver imaging	• Uses ASSET acceleration factors up to 3.5 • Delivers superior spatial and temporal resolution • Performs large-volume slice coverage in significantly shorter total scan times than is possible with conventional techniques

Additional Neuro Functionality	
T1 and T2 Fluid-Attenuated Inversion Recovery (FLAIR)	
Suppresses signal from CSF	• T1 and T2 FLAIR provide exceptional contrast between white and grey matter while suppressing the signal from CSF in T1- and T2-weighted brain and spine imaging
Echoplanar and FLAIR Echoplanar Imaging	
Rapid neuro imaging	• Enables rapid imaging in procedures such as functional brain mapping
Diffusion-Weighted Echoplanar Imaging	
Enables the detection of acute and hyper-acute stroke	• Single-Shot FLAIR EPI and Single-Shot, diffusion-weighted EPI with b-value up to 10,000 s/mm^2 • Automatic isotropic diffusion-weighted images are reconstructed • Multi-NEX capability • On-line image processing • ADC maps (enabled by FuncTool Performance – see page 20)
BRAVO (Brain Volume) Imaging	
Fast IR-prepared 3D gradient echo imaging technique	• Affords isotropic, whole-brain coverage with 1 mm x 1 mm x 1 mm resolution • Coupled with parallel imaging, produces superior grey-white matter contrast in one third of the time of a conventional acquisition
2D MERGE (Multi-Echo Recombined Gradient Echo)	
2D imaging technique designed to image the C-spine	• Automatically acquires and sums multiple gradient echoes at various echo times • Improves grey-white matter contrast within the spinal cord • Provides excellent demonstration of neuroforaminal canals

Signa HDx 3.0T ScanTools (continued)

Additional Cardiac and Angiographic Functionality	
Black Blood Double and Triple Inversion Recovery	
Enables "black blood" cardiac imaging via an inversion recovery (IR) prep pulse that nulls the signal from blood	• User-selectable, blood-suppression factor to optimize image quality • Performs across a single or double R-R interval • Triple IR also suppresses the signal from fat
ECG-Gated FGRE and FSPGR FastCine	
Enables functional acquisitions of the heart	• Full R-R coverage to image the entire cardiac cycle from systole through diastole • Based on the patient's heart rate, view sharing is utilized to easily fit the acquisition into a single breath-hold
2D, 3D Gated and Enhanced Time of Flight (TOF) Imaging	
Ideal for non-contrast enhanced angiography in the body	• Relies on flow related enhancements to distinguish moving from stationary spins
2D and 3D Phase Contrast (2D PC, 3D PC)	
Determines flow velocities and directional properties of blood flow in vessels	• Also useful for other moving fluids such as CSF
SmartPrep	
Improves contrast-enhanced MRA by ensuring trigger upon contrast arrival	• Uses a special tracking pulse sequence to constantly monitor the signal throughout user-prescribed volume • Detects arrival of contrast bolus to automatically trigger the acquisition
SmartStep	
Enhances peripheral vascular run-offs	• Adds table-stepping capabilities to SmartPrep • Optimizes contrast enhancement in peripheral vascular run-offs
Interactive Vascular Imaging (IVI)	
Quickly post-processes and removes background from MR angiography images	• Produces angiographic and maximum intensity projections (MIPs) in multiple scan planes • Results can be auto-saved as separate series within an exam for quick recall

Parallel-Imaging Acceleration Techniques

Array Spatial Sensitivity Encoding Technique (ASSET)

Used for reducing scan time, for increasing spatial or temporal resolution, decreasing susceptibility effects or for acquiring more slices in a given scan time. ASSET is also an effective way to manage SAR at 3.0T

- Use with phased-array coils and acceleration factors up to 3.5
- Minimizes patient's total RF exposure, thereby reducing SAR
- Compatible with the following pulse sequences:
  - 2D Fast Gradient Echo (2DFGRE)
  - 2D Fast Spoiled Gradient Echo (2DFSPGR)
  - 3D Fast Gradient Echo (3DFGRE)
  - 3D Fast Spoiled Gradient Echo (3DFSPGR)
  - 3D Time-of-Flight Gradient Echo (3DTOFGRE)
  - 3D Time-of-Flight Fast Spoiled Gradient Echo (3DFSPGR)
  - 2D Fast Spin Echo (2DFSE)
  - 2D Fast Spin Echo-XL (2DFSE-XL)
  - 2D Fast Recovery Fast Spin Echo (2DFRFSE)
  - 2D Fast Recovery Fast Spin Echo-XL (2DFRFSE-XL)
  - 2D Fast Spin Echo Inversion Recovery (2DFSE-IR)
  - 2D T1-Fluid Attenuated Inversion Recovery (T1-FLAIR)
  - Single-Shot Fast Spin Echo (SSFSE)
  - Echoplanar Imaging (EPI)
  - Diffusion-Weighted Echoplanar Imaging (DW-EPI)
  - BRAVO
  - HD LAVA
  - Diffusion Tensor Imaging (DTI) (optional HDx neuro application)
  - 3D FLAIR (optional HDx neuro application)
  - TRICKS-XV (optional HDx vascular application)
  - BrainWave-RT (optional HDx fMRI application)

Generalized Encoding Matrix (GEM)

Highly accelerated imaging and reconstruction technique to increase resolution and coverage in a fraction of the usual scan time

- In 3D imaging, accelerates simultaneously along phase and slice encoding directions
- Self calibrated with artifact reduction when compared with other parallel imaging approaches
- Iterative, hybrid-space parallel imaging reconstruction method
- Enables single breath-hold isotropic body imaging with LAVA-XV
- Enables high temporal and spatial resolution with VIBRANT-XV
- GEM is enabled by the installation of the following options on your system:
  - VIBRANT-XV (optional HDx body application)
  - LAVA-XV (optional HDx body application)

Signa HDx 3.0T ScanTools (continued)

Post-Processing Functionality	
Multi-Projection Volume Reconstruction (MPVR)	
Quick and easy generation of volumetric images for MR angiography	• No need for thresholding • Uses an entire volume to generate images in any plane • Simultaneously creates real-time frames of reference
Multi-Planar Reformation (MPR)	
Enables evaluation of anatomy in off-axis planes	• Sagittal, coronal, oblique and curved planar reformations • Batch reformations • Interactive Vascular Imaging (IVI) • 3D surface rendering
FuncTool Performance	
Enables advanced MRI post-processing	• ADC maps • eADC maps • Correlation coefficients for mapping of motor strip and visual/auditory stimuli • NEI (Negative Enhancement Integral) • MTE (Mean Time To Enhance) • Positive enhancement integral • Signal enhancement ratio • Maximum slope increase • Maximum difference function • Difference function • Optional single-voxel, 2D and 3D CSI post-processing

Imaging Options		
Standard Imaging Options		
Standard pulse sequence imaging options	• ASSET • Blood suppression • Cardiac gating/triggering • Cardiac compensation • Classic • DE prepared • Extended dynamic range • Flow compensation • Full echo train • IR prepared • Magnetization transfer • MART • Multi-station • Multi-phase and DynaPlan	• No phase wrap • Real time • Respiratory compensation • Respiratory gating/triggering • Sequential • SmartPrep • Spectral spatial RF • Square pixel • T2 prep • Tailored RF • VERSE • ZIP 1024 • ZIP 512 • 3D Slice Zip x 2 (Z2) and Zip x 4 (Z4)
Additional Imaging Options		
Available with the purchase of optional software packages	• Fluoro trigger (with the purchase of Fluoro-Triggered MRA) • fMRI (with the purchase of BrainWave-RT) • Navigator (with the purchase of Navigators 3D Cardiac)	

Optional Neuro Applications

PROPELLER

PROPELLER derives its name from its unique k-space acquisition, acquiring data in radial "blades" that rotate in sequence until the acquisition is complete.

Since each blade passes through the center of k-space, PROPELLER has unusually low sensitivity to motion artifacts, and unusually high contrast-to-noise properties. This makes it ideal for producing robust, high-resolution images even in challenging patient situations.

It is available in three different acquisition techniques.

- T2 FSE PROPELLER creates motion-artifact insensitive T2 FSE scans without time penalty while providing substantial increases in contrast-to-noise.
- T2 FLAIR PROPELLER achieves T2 FLAIR image contrast, with the same motion reduction attributes as T2 FSE PROPELLER.
- Diffusion-weighted PROPELLER reduces susceptibilities that challenge traditional EPI-based DWI imaging. It produces high-quality results even in the presence of dental work or in post-surgical patients.

Diffusion Tensor Imaging with FiberTrak

This package expands EPI capability to include Diffusion Tensor imaging, a special technique that utilizes up to 150 diffusion-sensitizing gradient directions. It generates excellent image contrast based on the degree of diffusion anisotropy in cerebral tissues such as white matter. FuncTool capabilities on the console (included with ScanTools) create Fractional Anisotropy Maps (FA Maps) and Volume Ratio Anisotropy Maps (VRA Maps).

The optional FiberTrak post-processing capability utilizes the eigen-vector information from the Diffusion Tensor acquisition and processing. Using a robust and efficient seeding process, this processing quickly produces maps of diffusion along the white-matter tracts using the principal axes of diffusion (eigen vectors).

3D FIESTA

3D FIESTA (Fast Imaging Employing Steady-State Acquisition) has been SAR optimized for 3.0T. This sequence delivers extremely short repetition times (TR) between RF pulses, delivering high T2 contrast and making it ideally suited for rapid, high-resolution imaging in areas such as the Internal Auditory Canals (IACs).

FIESTA-C

This phase-cycled FIESTA approach reduces sensitivity to susceptibility changes that may be encountered when imaging in the posterior fossa at 3.0T. It provides exquisite contrast that is ideal for visualizing the Internal Auditory Canals (IACs) as well as for T2 imaging in the cervical spine.

3D FLAIR

Powered by GE's ASSET parallel imaging, 3D FLAIR provides FLAIR-weighted contrast in a three-dimensional, isotropic acquisition. 3D FLAIR has many advantages over conventional 2D approaches. Thinner slice thicknesses enable isotropic volume acquisitions that can be reformatted into any plane after the first acquisition, with no loss in spatial resolution.

3D COSMIC

This 3D imaging technique is designed specifically for imaging in the C-spine. It provides a unique, fluid-weighted contrast to improve visualization of the cervical nerve roots and the intervertebral disks.

PROBE-PRESS Single-Voxel

PROBE-PRESS Single-Voxel Spectroscopy allows you to non-invasively evaluate the relative concentrations of in-vivo metabolites. It lets you acquire and display volume localized, water-suppressed 1H spectra in single voxel mode. This package includes the PROBE-P (PRESS) pulse sequence as well as automated reconstruction, acquisition set-up and graphic prescription of spectroscopic volumes.

PROBE-PRESS and PROBE-STEAM Single-Voxel

For advanced spectroscopy users, this enables single-voxel capability with both the PROBE-PRESS and PROBE-STEAM pulse sequences.

PROBE 2DCSI

This capability lets you extend your Probe-PRESS spectroscopic capabilities to perform 2D CSI acquisitions, thereby enabling simultaneous multi-voxel, in-plane acquisitions. Post-processing, including the creation of metabolite maps, is automatically generated with the FuncTool Performance Package (included in ScanTools). Signa HDx 3.0T supports true, multi-channel PROBE 2DCSI capabilities.

PROBE 3DCSI

With this capability, you can extend advanced Probe-PRESS 2DCSI spectroscopic capabilities to include three-dimensional, multi-voxel acquisitions in both the slice select and in-plane scan directions. All post-processing, including the creation of metabolite maps, is automatically generated with the FuncTool Performance Package (included in ScanTools). Signa HDx 3.0T supports true, multi-channel PROBE 3DCSI capabilities.

BrainWave Real-Time Functional Brain Mapping Package

This advanced software package allows a single operator to acquire, process and display BOLD (Blood Oxygen Level Dependent) fMRI color activation images in real time, directly on the scanner operator console. With ASSET compatibility to further improve image quality, BrainWave RT supports up to 25 frames per second of EPI imaging with these images being installed directly into the scanner database (up to 20,000 images/series).

Multiple options for displaying 2D real-time activation maps are available in order to improve patient compliance. This package may be used with user-minded paradigms and custom stimulus equipment supplied independently from GE. Resulting images may be rendered in 3D with the BrainWave Post Acquisition (BrainWave PA) software option.

BrainWave Post-Acquisition Software

This high-performance visualization software allows you to render detailed 3D brain images to provide visualization of functional activation from fMRI data acquired with BrainWave Real-Time. Display modes for the composite color activation Z-maps generated from one or more paradigms include segmented brain-only and unsegmented transparent-skull modes. Additional interrogation tools such as cut, peel and cross-reference permit detailed visual exploration of activated areas on the 3D-rendered model.

BrainWave Hardware Lite Supplemental Paradigm Delivery

BrainWave Hardware Lite is a supplemental paradigm delivery system for functional MRI, developed for use with BrainWave Real-Time (RT) image acquisition software on the HDx MR system. BrainWave Hardware Lite includes a dedicated computer workstation, equipment rack and penetration panel waveguide insert, Cedrus patient response pads, and related cabling and connectors. It is designed to deliver visual and auditory stimuli and receive a tactile response. The computer includes preset paradigms and software tools to generate custom protocols. The visual and auditory output can be coupled to fMRI delivery systems purchased separately from other vendors (not included with BrainWave Hardware Lite).

Optional Advanced Spectroscopic Imaging

Multi-Nuclear Spectroscopy

GE offers a complete multi-nuclear package tailored for non-proton spectroscopy and imaging applications. This package includes a powerful RF broad band amplifier and Sage 7 post-processing software. Sites purchasing MNS will also want to consider which nuclei they want to study. Possible choices include 31P, 13C, 19F, 23Na, 7Li, 129Xe or 3He. All T/R switches and MNS coils must be purchased separately.

Advanced Spectroscopy Package

Tailored for your advanced spectroscopy needs, this package gives you complete flexibility in spectroscopic functionality. It expands conventional Probe-P (PRESS) and Probe-S (STEAM) capabilities to give you access to fid, spin-echo and self-refocused spin echo sequences.

Sage 7 Software

SAGE 7 (Spectroscopy Analysis by General Electric, Version 7) allows you to process, display, manipulate, analyze, manage and print in-vivo spectroscopy data via an easy-to-use, graphical interface. You are able to apply a wide array of filters, transformations, correction algorithms, segmentations and quantifications to obtain precise information from your spectroscopic data. You can also output the data not only to a postscript printer, but also in electronic formats ranging from BMP, EPS and GIF to JPEG, PICT and TIF.

Optional Cardiovascular Applications

TRICKS-XV: Time-Resolved Imaging of Contrast Kinetics

Conventional MRA mandates trade-offs between spatial and temporal resolution, and poorly timed bolus capture often makes the problem worse. GE's exclusive TRICKS-XV takes an entirely different approach to this challenge. It uses an intricate 3D k-space acquisition and reconstruction strategy – an approach that accelerates the acquisition's temporal resolution without sacrificing spatial resolution. The result is perfect arterial, venous and equilibrium 3D volumes, even in those instances where there may be delayed flow or different flow patterns exhibited between the contra-and epsilateral sides.

To further enhance the temporal resolution capability, GE has made TRICKS-XV compatible with ASSET. This technique enables quick, repeated scanning of large, high-resolution volumes and benefits applications where fast flow is seen such as in ArterioVenous Malformations (AVMs) or shunts.

Additionally, TRICKS-XV can provide unsubtracted images or images subtracted from a mask view. The user is able to select subtracted, unsubtracted or both types of reconstructions from a single image set.

Fast Gradient Echo-Train

Utilizing GE's leadership echo-train technology, this sequence combines EchoPlanar and GRE imaging. It allows rapid, multi-slice, multi-phase imaging of the heart, optimizing temporal resolution over a short period of time.

Fluoro-Triggered MRA

Fluoro-Triggered MRA images the area of interest continuously and provides a visual display of image intensity. It enables the user to manually trigger each angiographic acquisition as soon as he or she is satisfied with the level of vessel enhancement. This switchover occurs almost instantly; in less than one second. The result is an interactive, ASSET-compatible and extremely accurate approach to contrast-enhanced MRA.

ECG-Gated 2D FIESTA Cine Cardiac Imaging

FIESTA (Fast Imaging Employing Steady-State Acquisition) is a fully balanced, steady-state coherent imaging pulse sequence that has been SAR-optimized at 3.0T to produce high SNR images at very short TRs. The pulse sequence uses fully balanced gradients to rephase the transverse magnetization at the end of each TR interval. This sequence accentuates the contrast of anatomy with high T2/T1 ratios, such as the cardiac blood pool, while suppressing the signal from tissues with low T2/T1 ratios such as muscle and myocardium. The net result is significant contrast enhancement between the myocardium and the blood pool.

Cardiac Tagging

Tagging applies spatial SAT pulses over the anatomy of interest to obtain cardiac images that are sensitive to tissue motion. Sometimes used to evaluate contractile motion of the myocardium, there are two tagging selections available – stripes and grid.

3D FatSat FIESTA Coronary Artery Imaging

This acquisition allows acquisition of breath-held 3D datasets of the coronary arteries. It combines enhanced vessel contrast with maximum background suppression and results in datasets that can be quickly reformatted to demonstrate each coronary distribution.

Navigators for 3D Coronary Imaging

This software package is designed for use in conjunction with 3D IR-prepared FGRE or 3D FatSat FIESTA for coronary imaging. Prospective navigators monitor the diaphragm position enabling the patient to breathe freely throughout the acquisition while eliminating respiratory motion from the resultant images. These 3D volumes are suitable for post-processing in order to demonstrate each complete coronary distribution.

IR-Prepared FGRE Sequence

This technique consists of an IR-prepared FGRE sequence that, through the application of a user-programmable inversion time, allows the suppression and enhancement of various tissues within the myocardium. It is available in both 2D and 3D acquisition modes.

ReportCARD®

GE's exclusive ReportCARD cardiac reporting software provides a fast and easy way to simultaneously review and analyze cardiac MR images as well as to generate comprehensive reports for referring physicians.

Its functionality includes the ability to:

- Completely evaluate for patent foramen ovale by analyzing images acquired with a non-invasive, IR-prepared fast gradient echo-train sequence.
- Analyze and quantify flow measurements using cine phase contrast images of blood flow or CSF flow.
- Conduct quantitative time course imaging analysis.
- Perform myocardial scarring analysis.

ReportCARD makes it possible to quickly and accurately complete clinical reports on cardiac MR exams including reports tailored specifically to pediatrics and CSF flow. It automatically compares newly acquired measurements against a set of predetermined normal values and flags those that are outside this normal range. Pre-written, user-programmable macros interface to these measurements to generate a complete report in just minutes.

i-Drive Pro Plus

This package expands i-Drive Pro functionality (standard with the Signa HDx 3.0T ScanTools package).

Making this intuitive point-and-click interface even more powerful and flexible, i-Drive Pro Plus permits geometric scan plane changes on the fly. The user can quickly center the region of interest within a given FOV, changing the FOV size if desired. It also gives the operator the ability to adjust contrast parameters in real time including such parameters as spatial SAT on/off, fat saturation and flow compensation. Scan planes can be stored as thumbnails and quickly restored with the simple click of a mouse. Images are easily stored from the real-time interface into the permanent image database for future review.

Optional Body Applications

LAVA-XV Imaging

LAVA-XV (Liver Acquisition with Volume Acceleration) extends HD LAVA functionality that comes standard with the Signa HDx 3.0T ScanTools package. Incorporating GEM (GE's exclusive General Encoding Matrix) acceleration, LAVA-XV is a self-calibrated acquisition approach that allows acceleration in both the phase encoding as well as the slice select direction. The result is higher acceleration, better slice coverage and higher spatial and temporal resolution than is possible with HD LAVA alone, enabling high-resolution, single breath-hold imaging of the abdomen and pelvis.

VIBRANT-XV Breast Imaging

VIBRANT-XV (Volume Imaging for Breast Assessment) permits simultaneous, high-definition and fat-suppressed bilateral breast imaging in both the axial or sagittal scan planes. With VIBRANT-XV, imaging is performed without in-plane data interpolation for enhanced data integrity. Powered by GEM (GE's exclusive General Encoding Matrix) acceleration, VIBRANT-XV allows acceleration in both the phase encoding as well as the slice select direction. This is coupled with a patented fat-saturation technique and automatic subtraction of images. The result is high spatial and temporal resolution images that demonstrate exquisite contrast and high lesion conspicuity. The high spatial resolution makes the VIBRANT-XV acquisition ideally suited for reformation into other scan planes.

BREASE Breast Spectroscopy

Conventional MR imaging has been well established as delivering high sensitivity breast imaging. Through the use of single-voxel breast spectroscopy, breast MR may now also deliver improved specificity characterization of lesions. A voxel placed over a lesion in question allows the detection of choline in the resultant spectrum.

CadStream Breast Analysis

The CADStream package includes hardware and post-processing software that facilitates analysis and management of breast image data. Image processing is performed automatically, using predefined templates for non-rigid image registration, subtraction, parametric maps, maximum intensity projection and multi-planar reformat. CADStream also generates reports that include images and graphs reports that can be exported in PDF or DICOM formats.

CADstream includes SureLoc – a tool that helps radiologists to more efficiently calculate coordinates for MR-guided interventions at the point of procedure. SureLoc reports needle position in real time and displays images and needle position in the patient's orientation.

Optional Musculoskeletal Applications

CartiGram

CartiGram is a non-invasive T2 mapping package that provides high-resolution maps of the T2 values in cartilage and other tissues. The imaging results are color coded to highlight those structures with increased water content yielding elevated T2 values.

Post-Processing

Post-processing has become an increasingly important factor in the diagnostic utility of MRI exams, especially as scanners have evolved to amass ever-greater volumes of data. The Signa HDx lets users take full advantage of the resulting datasets with a portfolio of proven and new post-processing capabilities.

The optional GE Advantage Workstation® is an excellent tool for post-processing datasets acquired with the Signa HDx 3.0T, providing streamlined workflow that doesn't encroach on valuable scanner console time.

Siting

The specifications provided here will give you an overview of the siting requirements of the 3.0T Signa HDx scanner including the 3.0T magnet and gradient electronics.

Alternative environments, such as modular buildings, may also be appropriate; buildings including air-conditioning, heating, chiller, RF shielding and additional magnetic shielding in the walls. Your GE representative can provide you with a comprehensive installation and siting manual for your engineering and architectural staff.

Electrical Supply System Requirements

GE recommends the following electrical supply configuration.

- 480 VAC/60 Hz 3-phase grounded WYE or
- 400 VAC/50 Hz 3-phase grounded WYE

Standby power consumption is 22.8 KVA at 0.9 lagging power factor including 4.4 KVA for PDU, 4.9 KVA for the gradient coil water chiller, 9KVA (continuous operation) for Shield/Cryo Cooler Cabinet, and 1.5 KVA 1 phase for Magnet Monitor equipment (4.5 KVA 3 phase equivalent).

Typical Room Layouts

Magnet Room	
Dimensions (W x D)	3.385 m x 5.986 m (11.11 ft. x 19.64 ft.)
Ceiling height	Typical 2.67 m (8.76 ft.) Minimum 2.5 m (8.20 ft.)
Equipment Room	
Dimensions (W x D)	2.39 m x 5.21 m (7 ft. 8 in. x 17 ft. 1 in.)
Control Room	
Dimensions (W x D)	1.52 m x 2.13 m (4.98 ft. x 6.98 ft.)

Fringe Field		
	Axial	Radial
0.5mT (5-gauss line)	5.0 m (16.4 ft.)	2.8 m (9.19 ft.)
0.1mT (1-gauss line)	7.4 m (24.28 ft.)	4.4 m (14.43 ft.)

Installation Dimensions and Weights			
	Width	Height	Weight
Magnet assembly 3.0T actively shielded with enclosure and RF body coil	2.3 m (7.56 ft.)	2.60 m (8.54 ft.)	11,020 kg (24,300 lbs.)
Vibroacoustic mat (optional)			261 kg (575 lbs.)
Patient transport	62.2 cm (2.04 ft.)	97 cm (3.18 ft.)	127 kg (280 lbs.)

Further Considerations

Here are a few more important things you should know about the Signa HDx 3.0T scanner.

Accessory Package

The scanner comes complete with System Performance Testing (SPT) phantom set and storage cart, customer diagnostic software, operator manuals and patient log books.

Emergency Stop

Located in the magnet room, this control disconnects electrical power to the RF and gradient components in the magnet room. A duplicate control is located on the magnet itself.

Warranty

The published Company warranty in effect on the date of shipment shall apply. The Company reserves the right to make changes.

InSite™ Remote Diagnostics

GE-unique remote service and applications support, including magnet monitoring, is readily available. InSite also allows downloading of applications software including the capability to trial GE's optional software packages through GE's eFlexTrial program.

GE Regulatory Compliance

The 3.0T Signa HDx system is a CE-compliant device that satisfies Electro-Magnetic Compatibility (EMC) and Electro-Magnetic Interface (EMI) regulations, pursuant to IEC-601.

Laser alignment devices contained within this product are appropriately labeled according to the requirements of the Center for Devices and Radiological Health.

For more than 100 years, healthcare providers worldwide have relied on GE Healthcare for medical technology, services, and productivity solutions. So no matter what challenges your healthcare system faces, you can always count on GE to help you deliver the highest quality healthcare. For details, please contact your GE representative today.

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