



Revolution™ EVO

Operator Manual Addendum

This manual supports the following configurations:

- Revolution™ EVO EL
- Revolution™ EVO EX
- Revolution™ EVO ES

Not all configurations are available in all regions.

This product is certified as a Revolution™ EVO CT Scanner.



5805442-1EN

Revision: 2

General User Documentation

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Revision history

Revision	Date	Reason for change
1	May 2019	Initial release
2	November 2023	Updated information

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Chapter 1: How to Use This Manual

The contents in this document are to replace the contents in the User Manual and Technical Reference manual.

Table 1-1: Related Manuals

User Manual	Technical Reference Manual
5805440-xx	5805441-xx

The chapter of this manual is read for the related chapter of each manual:

Table 1-2: Chapter Matrix

Chapter of this Manual	Chapter of User Manual	Chapter of Technical Reference Manual
1	--	--
2	1	--
3	7	--
4	--	18
5	--	11
6	--	3
7	--	12

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Chapter 2: Read Me First

About This Guide

Purpose of This Guide

This user guide is written for health care professionals (namely, the technologist) to provide the necessary information relating to the proper operation of this system. The guide is intended to teach you the system components and features necessary to use it to its maximum potential. It is not intended to teach imaging or to make any type of clinical diagnosis.

This user guide should be kept with the equipment at all times. It is important for you to periodically review the procedures and safety precautions. It is important for you to read and understand the contents of this guide before attempting to use this product.

This user guide is originally written in English, and is applicable to Revolution™ EVO software, version 20HW16.xx.

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Chapter 3: Equipment

Computer Console

The operator console is comprised of:

- media tower
- scan monitor
- display monitor
- Scan Control Interface Module (SCIM) and keyboard
- mouse
- Bright Box
- Computer

Figure 3-1: Operator console



Table 3-1: Operator console components

No.	Description
1	<p>Digital Video Disk Read/Write (DVD-R/W)drive</p> <ul style="list-style-type: none"> ● The CD/DVD/USB option uses the DVD-R drive to write to or restore from CD-R or DVD-R. ● The Data Export option can save information to CD-R. ● Use to save ECG traces. ● Use to export protocols. ● Use to save scan files, protocols and service files to DVD-RAM media. ● Use to access the electronic copies of the operator documentation. ● The CD/DVD/USB recognizes Hard Disk Drive(USB drive) or USB key(Flash memory) with VFAT format. It does not recognize any hardware with extension 3 format.

No.	Description
2	<p>USB Connection: Located in lower-right corner of the media tower. The CD/DVD/USB recognizes Hard Disk Drive (USB drive) or USB key (Flash memory) with VFAT format. It does not recognize any hardware with extension 3 format.</p> <ul style="list-style-type: none"> ● Supports connecting a USB storage device to save or restore scan files or Dicom image. ● Supports connecting a USB storage device to export the data. ● The Bar Code Reader may be connected to one of the USB ports. ● The storage device should have a minimum size of 4 GB. ● Only one USB for saving scan data can be connected at a time if there are multiple USB ports.
3	<p>Computer power on/off switch: Located on the front of the console.</p> <ul style="list-style-type: none"> ● Use to start up the system. ● Use to shut down the system.

Computer

The computer is located at the base of the console and it contains all the hardware necessary to operate the system and perform image generation.

It uses a PC based computer system running a Linux based operating system. The system includes system, image and scan data disks and stores up to 460,000 512 images and with 500 giga byte for scan data files.

Reconstruction Engine

- The reconstruction engine provides advanced processing capabilities for the reconstruction of routine imaging modes and ASiR-V/ASiR modes and SmartMAR mode.



Do not use the input-output interface (DVD drive, USB, ethernet, etc.) on HP workstation of the console.

Console rear plug-in panel

Figure 3-2: Console rear plug-in panel



Table 3-2: Console-rear plug in panel components

No.	Description
1	Scan Monitor Power Connection
2	Display Monitor Power Connection
3	Option Power Connection
4	Option Power Connection
5	Host Power Connection
6	PMT Power Connection
7	In Room Monitor Power Connection
8	Option Power Connection
9	GSCB Power Connection
10A, 10B, 10C	Accessory Grounds
11	Power Inlet
12	Circuit Breaker

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Chapter 4: System Specifications

(Reference: IEC60601-1:2005 Clause 7.9.3.1, IEC60601-1-3:2008 Clause 5.1.1)

System Component Labeling

Table 4-1: Model Numbers

Component	Model Number	Rating Plate Locations	Certified Component?
Gantry	(Scanner ID) 5454001-x	Lower, left gantry base in rear	Y
CT Operator Computer Console	5946404-x	Rear of Cabinet	Y
VT1700V (500 lbs (227 kg)) Table or VT2000 (500 lbs (227 kg) Long) Table or VT2000x (675 lbs (306 kg) Long) Table	5122080-1x 5121647-x 5380966-x	Right side, low on front leg	Y
Performix™ 40 Plus Tube unit	2137130-x (Assembly)	On housing center	Y
Collimator	5345001-x	Tube at 12 o'clock on collimator front	Y
Generator	2371333-x	On Power Module housing	Y
Power Distribution Unit	2326492-81	Back horizontal surface of top cover	N

Throughout this manual, model numbers may contain a "-x" (i.e. 2137130-x). In these instances "x" can be any numeric or alpha numeric character. For example, in 2137130-x, "-x" refers to 2137130, 2137130-2, 2137130-3, etc.

All patient tables may not be available in all regions.

All the following figures are examples of the rating plate and name plate.

Figure 4-1: Console Rating Plates

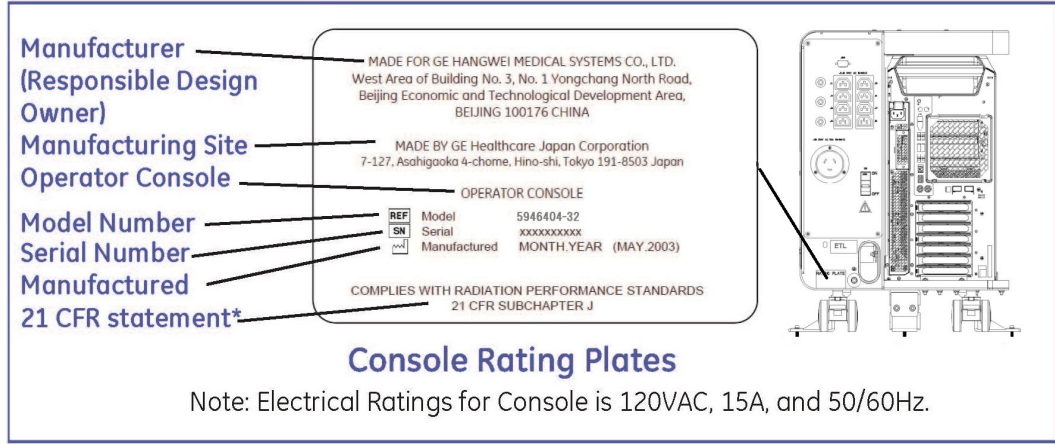


Figure 4-2: Console Rating Plates

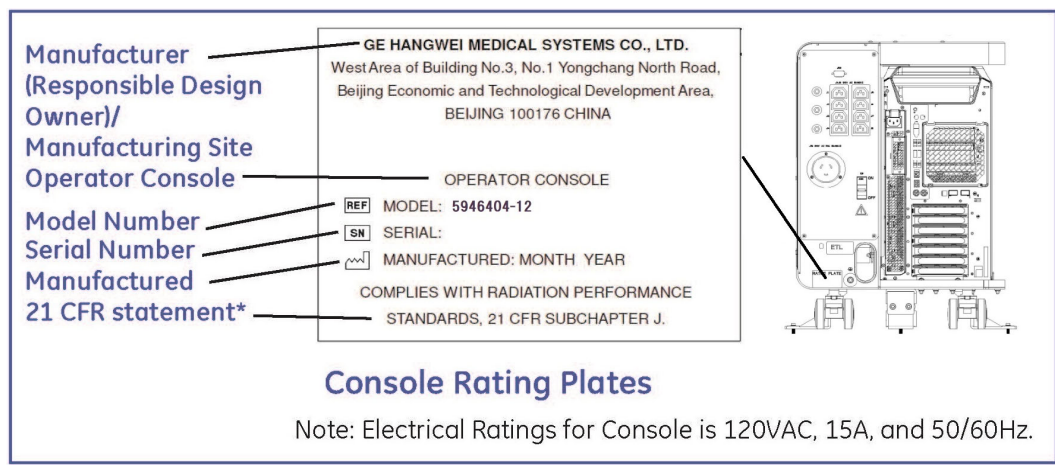
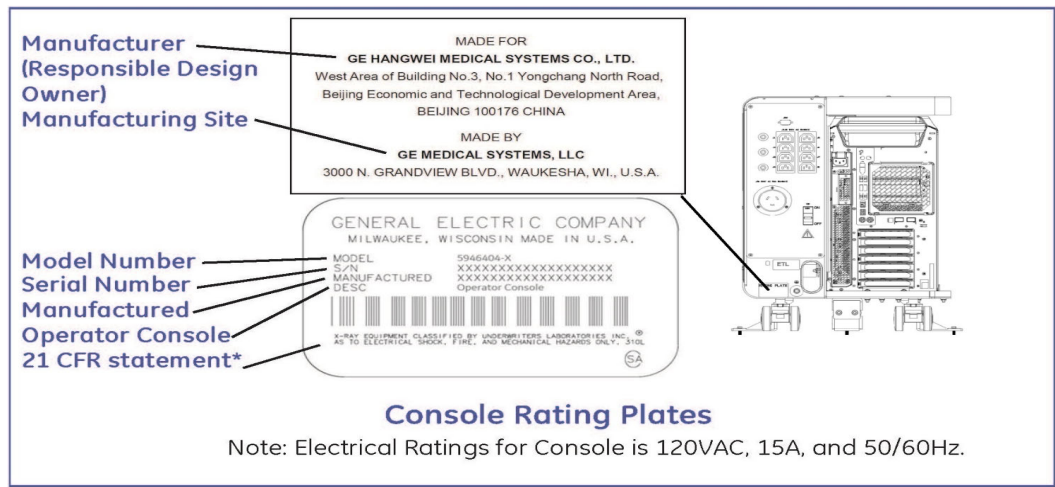


Figure 4-3: Console Rating Plates



Electrical Rating for Console is 120VAC, 15A and 50/60Hz.

System Dimensions

Table 4-2: System Dimensions

Component		Size (inches) (wide, height, depth, foot print)	Size (cm) (wide, height, depth, foot print)	Weight (lbs)	Weight (kg)
Gantry		80.7(w), 76.3(h), 40.9(d)	205(w), 194(h), 104(d)	4012	1820
Computer Console	NIO	15.7(w), 22.7(h), 26.5(d)	40(w), 58(h), 67(d)	143	65
	Console Peripherals	51.2(w), 35.2(d)	130(w), 85.0(d)	114	52
VT1700V (500 Pounds (227 kg)) Table		25.6(w), 41.2(h), 92.9 (d), 175.6(f)	65(w), 105(h), 236.0(d), 446(f)	981	445
VT2000 (500 Pounds (227 kg) Long) Table		25.6(w), 41.2(h), 114.6(d), 225.0(f)	65(w), 105(h), 291.0(d), 572(f)	1113	505
VT2000x (675 Pounds (306 kg) Long) Table		25.6(w), 41.2(h), 114.6(d), 225.0(f)	65(w), 105(h), 291.0(d), 572(f)	1122	509
Power Distribution Unit		27.6(w), 41.8(h), 21.7(d)	70(w), 106(h), 55(d)	816	370
Total System Weight		VT1700V (500 Pounds (227 kg)) Table		6131	2781
		VT2000 (500 Pounds (227 kg) Long) Table		6263	2841
		VT2000x (675 Pounds (306 kg) Long) Table		6272	2845

Purchasable Options

Table 4-3: Supplementary Equipments Types and Models

Type	Manufacturer/Model
Partial UPS	Eaton Powerware 9155-10GE
	VERTIV GXT4-10000RT208-GE
Bar Code Reader	Honeywell 3800g
	Honeywell 1300g
SmartStep Monitor (includes LCD monitor, video splitter, and mountings)	GE 5115174-20
SmartStep Handheld Control	GE 2199947-2
SmartStep Foot pedal	GE 2199945-2

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Chapter 5: General Information

Data Storage

3,000 GB Disk (system, image, scan disks) stores up to 460,000 512x images and 3,520 scan rotations at 32 or 64 slice mode or up to 1,500 scan data files, or up to 300 exams.

Despite storage space, the system eventually runs out of disk space. If your facility plans to preserve image data, you must periodically transfer images and scan information to the designated archive media.

DVD (9.4 GB) stores up to 7,168 images.

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Chapter 6: Safety

Radiation Safety

CTDIvol

As you setup the scan parameters from the ViewEdit screen, the Dose Information area at the upper right of the scan monitor contains updated dose information. This dose information is based on a measurement of the CTDI (CT Dose Index), which is the current standard for CT dosimetry and performance. By using a measurement called CTDIvol, a single value is provided to estimate the relative dose for an exam.

The CTDIvol is a weighted average measurement in a reference phantom. This dose is expressed in milliGrays. For additional information on specific CTDIvol doses and their calculations, refer to your Technical Reference manual.

The DLP is the product of the CTDIvol and the scan length for a group of scans. This number can be summed over the entire exam to give an estimate of the total dose. The value is expressed in milliGray centimeters.

The Projected Series DLP shows the DLP that would result from scanning the current group or groups.

The Accumulated Exam DLP displays the total exam DLP up to the current point in time. Scout dose is included in the DLP totals but is generally a very small part of the exam.

The dose information updates when technique values such as kV, mA, scan time, slice thickness, and scan field of view are changed.

Dose information is saved a screen save image in Series 999 upon selecting End Exam, Series 997 contains the DICOM Dose Structured Report.

Accessories

Table 6-1: GE Approved Accessories Types and Models

Type	Manufacturer/model
Cardiac Monitor	IVY 3100 - B with ethernet IVY 3150 - B IVY 3150 - C IVY 7800
Respiratory Monitor	Varian RPM 1.7 Varian RGSC 1.1/2.0
External Hard Drive	Seagate FreeAgent 1TB USB 2.0 Seagate FreeAgent 2TB USB 2.0/3.0
Flat Table Top	DIACOR Flat Table Top (E6315JE, E63151JE)

Type	Manufacturer/model
Patient contrast injector: For Xstream Injector option	Nemoto Dual Shot Alpha (CiA425 Class I) / GE 5328194 Nemoto Dual Shot Alpha (CiA425 Class IV) / GE 5328195 Nemoto Dual Shot Alpha 7 (CiA425 Class IV)* Nemoto Dual Shot GX (CiA425 Class IV)* Nemoto Dual Shot GX 7 (CiA425 Class IV)* Nemoto A-800 (CiA425 Class IV) / GE 5421942* Nemoto W1000 (CiA425 Class IV)* Medrad ISI900 (for Stellant D) (CiA 425 Class IV)/ GE 5335919 ulrich CT motion (XD8000) (CiA425 Class I)
Patient contrast injector: For Enhanced Xstream Injector option	Nemoto Dual Shot Alpha (CiA425 Class IV) / GE 5328195 Nemoto Dual Shot Alpha 7 (CiA425 Class IV)* Nemoto Dual Shot GX (CiA425 Class IV)* Nemoto Dual Shot GX 7 (CiA425 Class IV)* Nemoto A-800 (CiA425 Class IV) / GE 5421942* Nemoto W1000 (CiA425 Class IV)* Medrad ISI900 (for Stellant D) (CiA 425 Class IV)/GE 5335919 ulrich CT motion (XD8000) (CiA425 Class IV) Medtron Accutron CT-D (CiA425 Class IV)
Child Positioner	Child Positioner Option



*: Out of scope of EC Declaration compatibility with this CT system as of today. The update of compatibility can be confirmed by EC Declaration of Conformity letter of this product.



All patient accessories may not be available in all regions.

The standalone software medical devices listed on 5796848-xxx: Authorized Product Matrix Manual.

Additional accessories and supplies are available at <http://www3.gehealthcare.com/>.

The placement of the cardiac monitor should be on the monitor stand. The monitor should not be placed on the table. It should be positioned so that it is not touching the table or gantry when it is in use.

Chapter 7: Quality Assurance

DOSIMETRY

Dosimetry information is provided in terms of the CTDI and CTDI_w dose indices. Optionally CTDI_{vol} and its associated DLP (dose length product) is automatically computed and displayed on the patient Rx menu to assist in managing patient dose. This section provides a brief description to help you better understand these dose reporting standards.

CTDI_{vol} (Reference IEC 60601-2-44)


The volume CTDI_w (CTDI_{vol}) describes the average dose over the total volume scanned for the selected CT conditions of operation. The system computes CTDI_{vol} automatically.


NOTE: System computations may vary slightly from manual calculations due to differences in round-off or truncation operations.


e) Estimating CT scout scan

$$CTDI_{vol} = \frac{CTDI_w}{mAs} \times \text{Scout mA} \times \frac{N \times T [mm]}{\text{Table Speed} [\frac{mm}{s}]}$$

Symbol	Definition
NXT	collimation

 The ratio CTDI_w / mAs is evaluated independently of the scout acquisition but with the same settings of tube voltage and collimation as those of the scout acquisition.

 Scout scans on Revolution™ EVO use 5 mm collimation with 100 mm/s table speed for normal mode or 175 mm/s table speed for fast mode.

 CTDI_{vol} SPR (scan projection RADIOGRAPHY) for scout dose defined above is displayed and accumulated as part of CTDI_{vol} based on the following justification. Although the dose distribution of a SPR within the PHANTOM is different to the dose distribution of a tomographic scan, the average dose expressed by the CTDI_{vol} SPR in the PHANTOM can be considered as the same as for a tomographic scan, if the CT CONDITIONS OF OPERATION are the same.

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