APPLICATION FOR HCAI SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP-0423

HCAI Special Seismic Certification Preapproval (OSP)

Type: ☐ New ☒ Renewal

Manufacturer Information

Manufacturer: GE Healthcare

Manufacturer's Technical Representative: Tom Farnow

Mailing Address: 3000 N. Grandview Blvd., Waukesha, WI 531881696

Telephone: (888) 406-1101 Email: Tom.Farnow@gehcseismic.com

Product Information

Product Name: Revolution Discovery CT System; Revolution Frontier CT System

Product Model Number(s): See Attachment 1

Product Category: CT Systems

Product Sub-Category: CT Systems

General Description: System components of multiple-component medical diagnostic imaging systems. Special Seismic Certification is limited to components of the Revolution Discovery CT System identified in Attachment 1.

Mounting Description: Base Mounted Rigid -

Tested Seismic Enhancements: Seismic enhancements made to the test units and/or modifications required to address anomalies during the tests shall be incorporated into the production units.

Applicant Information

Applicant Company Name: EASE Co.

Contact Person: Jonathan Roberson

Mailing Address: 5877 Pine Ave Suite 210, Chino Hills, CA 91709

Telephone: (909) 606-7622 Email: j.roberson@easeco.com

Title: Principal Structural Engineer

California Licensed Structural Engineer Responsible for the Engineering and Test Report(s)

Company Name: EASE LLC

Name: Jonathan Roberson California License Number: S4197

Mailing Address: 5877 Pine Ave., Suite 210, Chino Hills, CA 91709

Telephone: (951) 295-1892 Email: jon@EASECo.com

Certification Method

☐ GR-63-Core ☒ ICC-ES AC156 ☐ IEEE 344 ☐ IEEE 693 ☐ NEBS 3

☐ Other (Please Specify):

Testing Laboratory

Company Name: ENVIRONMENTAL TESTING LABORATORIES, INC. (ETL)

Contact Person: Jeremy Lange

Mailing Address: 11034 Indian Trail, Dallas TX 75229-3513

Telephone: (972) 247-9657 Email: jermy@etldallas.com

Seismic Parameters

Design Basis of Equipment or Components (F_p/W_p) = See Attachment 1

S_{DS} (Design spectral response acceleration at short period, g) = 2.0 at z/h = 1; 2.5 at z/h = 0

a_p (Amplification factor) = See Attachment 1

R_p (Response modification factor) = See Attachment 1

Ω_0 (System overstrength factor) = 2.0

I_p (Importance factor) = 1.5

z/h (Height ratio factor) = 1 and 0

Natural frequencies (Hz) = See Attachment 2

Overall dimensions and weight = See Attachment 1

HCAI Approval (For Office Use Only) - Approval Expires on 07/01/2031

Date: 7/1/2025

Name: Mohammad Karim Title: Supervisor, Health Facilities

Special Seismic Certification Valid Up to: S_{DS} (g) = 2.0 z/h = 1

Condition of Approval (if applicable):

ATTACHMENT 1: SEISMIC CERTIFIED COMPONENTS

TABLE 1:

Manufacturer	**GE HEALTHCARE**
System	**REVOLUTION DISCOVERY CT SYSTEM**

COMPONENT	MODEL NUMBER	APPROX. DIMENSIONS (IN.) W	D	H	MAX. WT. (LB.)	MOUNT	BASIS [1]	F_P/W_P	S_{DS}	z/h	a_P	R_P	Ω_0
GANTRIES													
Revolution Discovery CT (CT HDe4) Gantry	5232083-100	89.3	40.5	75.6	4095	Floor	UUT 12144101-1	2.40 1.13	2.0 2.5	1 0	1	1 ½	2
PATIENT TABLES													
GT1700V	5122080-11	25.6	93.3	19.2 / 41.2	1059 [2]	Floor	UUT 12112601-2	2.40 1.13	2.0 2.5	1 0	1	1 ½	2
GT1700 N9 ED3	5122080-4	25.6	93.3	19.2 / 41.2	1059	Floor	INT						
GT2000X	5380966	25.6	114.5	18.3 / 41.3	1288	Floor	INT						
GT2000 N9	5121647-3	25.6	114.5	19.2 / 41.3	1146	Floor	UUT 12140801-4						
GT2000 N9 ED3 Assy	5121647-4	25.6	114.5	18.3 / 41.3	1146	Floor	SAME						
CONSOLES													
Console Assembly – GOC6.6	5212920-150	48.74	46.54 / 54.74	26.7 / 34.7	405	Floor	UUT 12131201-1	1.50 1.13	2.0 2.5	1.0 0.0	2 ½	6	2
NIO HD64 Console	5212920-186	18.5	29	25.8	163	Floor	UUT 12180501-3	1.44 1.13	2.0 2.5	1.0 0.0	1	2 ½	2
NIO HD64 Console	5212920-185	18.5	29	25.8	163	Floor	SAME	1.44 1.13	2.0 2.5	1.0 0.0	1	2 ½	2
POWER DISTRIBUTION (PDU)													
PDU (NGPDU-61)	2326492-61	27.6	21.7	41.8	818	Floor	UUT 12131301-2	1.44 1.13	2.0 2.5	1 0	1	2 ½	2

Mount	Floor (Rigid Base): free-standing, base-mounted condition with the component rigidly attached to a supporting structure and no lateral support above the base. Requires the use of brackets/mounting assemblies present during testing unless otherwise noted.
Notes	1. BASIS: • UUT#: Indicates that a test specimen matching these characteristics was tested as part of this testing program. • SAME: Model is physically, mechanically & electrically the same as test specimen. Difference is limited to model number, color, software and/or GE manufacturing location. • INT (Interpolated or Extrapolated): indicates a model that was not specifically tested, and by which seismic certification is established through evaluation of testing of other, similar models in the product line. 2. 1700V Patient Table weight does not include the 350 lb. simulated patient load present during testing. 3. GT 2000 Patient Table weight does not include the 550 lb. simulated patient load present during testing. 4. All components listed above are manufactured by GE Healthcare unless otherwise noted.

TABLE 2:

Manufacturer	**GE HEALTHCARE**
System	**REVOLUTION FRONTIER CT SYSTEM**

COMPONENT	MODEL NUMBER	APPROX. DIMENSIONS (IN.) W	D	H	MAX. WT. (LB.)	MOUNT	BASIS [1]	F_P/W_P	S_{DS}	z/h	a_P	R_P	Ω_0
GANTRIES													
Revolution Frontier Gantry (HDe6)	5232085-203	88.7	41.6	74.8	4061	Rigid Base	UUT 12180501-1	2.40 1.13	2.0 2.5	1 0	1	1 ½	2
Revolution Frontier Gantry (HDe6)	5232085-213	88.7	41.6	74.8	4061	Rigid Base	SAME	2.40 1.13	2.0 2.5	1 0	1	1 ½	2
Revolution Frontier Gantry (HDe6)	5232085-202	88.7	41.6	74.8	4061	Rigid Base	SAME	2.40 1.13	2.0 2.5	1 0	1	1 ½	2
PATIENT TABLES													
GT1700V	5122080-11	25.6	93.3	19.2 / 41.2	1059 [2]	Floor	UUT 12112601-2	2.40 1.13	2.0 2.5	1 0	1	1 ½	2
GT1700 N9 ED3	5122080-4	25.6	93.3	19.2 / 41.2	1059	Floor	INT [3]						
GT2000X	5380966	25.6	114.5	18.3 / 41.3	1288	Floor	INT [3]						
GT2000 N9 ED3 Assy	5121647-4	25.6	114.5	18.3 / 41.3	1146	Floor	SAME [3]						
CONSOLES													
Console Assembly (HDe6)	5940904-10	15.7	26.4	22.7	138	Rigid Base	UUT 12180501-2	1.44 1.13	2.0 2.5	1.0 0.0	1	2 ½	2
Console Assembly (HDe6)	5940904	15.7	26.4	22.7	138	Rigid Base	SAME	1.44 1.13	2.0 2.5	1.0 0.0	1	2 ½	2
Console Assembly	5940904-12	15.7	26.4	22.7	142.2	Rigid Base	UUT 1218181-1	1.44 1.13	2.0 2.5	1.0 0.0	1	2 ½	2
Console Assembly	5940904-13	15.7	26.4	22.7	142.2	Rigid Base	SAME	1.44 1.13	2.0 2.5	1.0 0.0	1	2 ½	2
Console Assembly	5940904-20	15.7	26.4	22.7	142.2	Rigid Base	SAME	1.44 1.13	2.0 2.5	1.0 0.0	1	2 ½	2
Console Assembly	5940904-23	15.7	26.4	22.7	142.2	Rigid Base	SAME	1.44 1.13	2.0 2.5	1.0 0.0	1	2 ½	2
POWER DISTRIBUTION (PDU)													
PDU (NGPDU-61)	2326492-61	27.6	21.7	41.8	818	Floor	UUT 12131301-2	1.44 1.13	2.0 2.5	1 0	1	2 ½	2

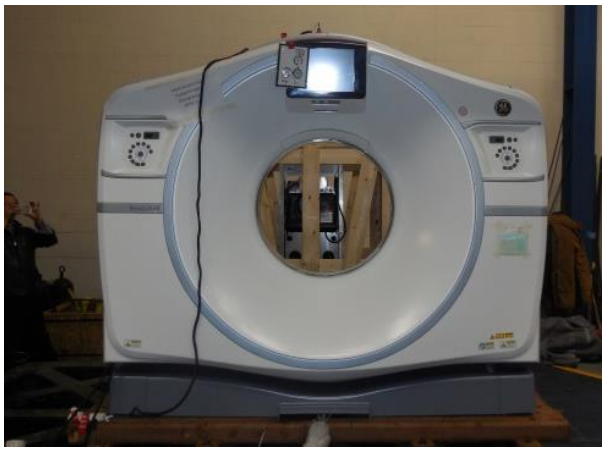
Table continues next page.

TABLE 2:

Manufacturer	**GE HEALTHCARE**
System	**REVOLUTION FRONTIER CT SYSTEM**

COMPONENT	MODEL NUMBER	APPROX. DIMENSIONS (IN.) W	D	H	MAX. WT. (LB.)	MOUNT	BASIS [1]	F_P/W_P	S_{DS}	z/h	a_P	R_P	Ω_0
Mount	Floor (Rigid Base): free-standing, base-mounted condition with the component rigidly attached to a supporting structure and no lateral support above the base. Requires the use of brackets/mounting assemblies present during testing unless otherwise noted.												
Notes	1. BASIS: • UUT#: Indicates that a test specimen matching these characteristics was tested as part of this testing program. • SAME: Model is physically, mechanically & electrically the same as test specimen. Difference is limited to model number, color, software and/or GE manufacturing location. • INT (Interpolated or Extrapolated): indicates a model that was not specifically tested, and by which seismic certification is established through evaluation of testing of other, similar models in the product line. 2. 1700V Patient Table weight does not include the 350 lb. simulated patient load present during testing. 3. See Table 1 4. All components listed above are manufactured by GE Healthcare unless otherwise noted.												

UUT 12144101-1	Revolution Discovery CT Gantry (CT HDe4)
MANUFACTURER:	GE Healthcare
IDENTIFICATION:	Model No.: 5232083-100 Serial No.: STOENG037G
DESCRIPTION:	System component of Revolution Discovery CT System
MOUNTING:	Floor mounted using (4) - 5/8" dia GR 8 bolts through leveling feet.



PROPERTIES:

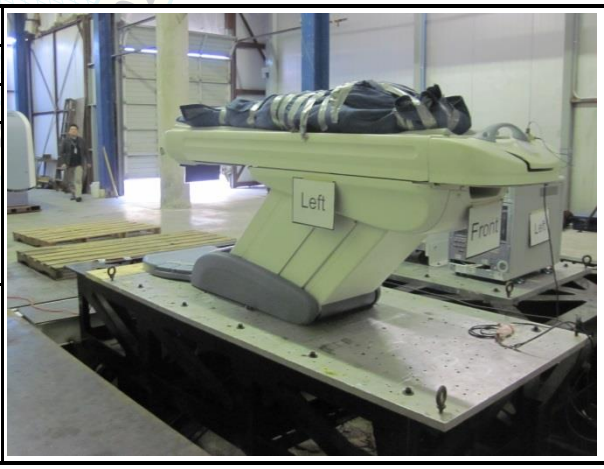
DIMENSIONS (in.)				LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height	Weight (lb.)	Front-Axis	Side-Axis	Vert-Axis
89.3	40.5	75.6	4095	5.0	7.1	15.7

SHAKE TABLE TEST PARAMETERS

CODE	TEST CRITERIA	S_{DS}	z/h	I_P	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2022	ICC-ES AC156-15	2.0 2.5	1 0	1.5	3.2	2.4	1.68	0.68

Unit satisfied AC156 requirements for structural integrity and manufacturer requirements for functionality after AC156 test.

UUT 12112601-2	GT1700V Table
MANUFACTURER:	GE Hangwei Medical Systems CO., LTD
IDENTIFICATION:	Model No.: 5122080-11
DESCRIPTION:	System component of the **Optima CT660 System** Test specimen included a simulated patient load of 350 lb. UUT tested at a height of 34.9".
MOUNTING:	Rigid Base (Floor) mounted using (4) – 5/8" dia. hex head bolts to interface plate.



PROPERTIES:

DIMENSIONS (in.)				LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height	Weight (lb.)	Transverse-Axis	Longitudinal-Axis	Vertical-Axis
25.6	93.3	19.2 / 41.2	1059+ 350 Patient	3.9	15.2	14.2

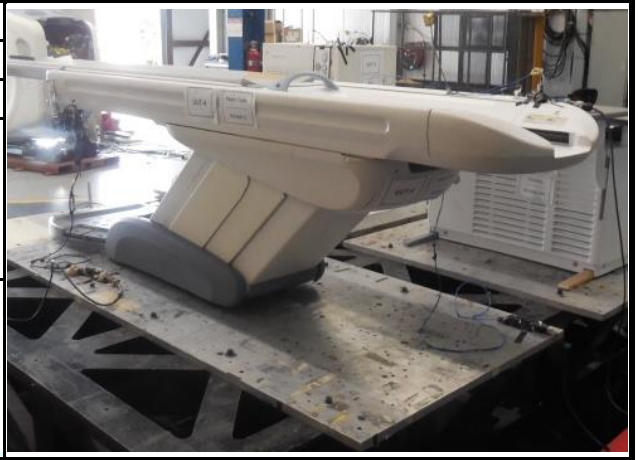
SHAKE TABLE TEST PARAMETERS

CODE	TEST CRITERIA	S_{DS}	z/h	I_P	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2022	ICC-ES AC156-15	2.0 2.6	1.0 0.0	1.5	3.2	2.40	1.74	0.70

Unit satisfied AC156 requirements for structural integrity and manufacturer requirements for functionality after AC156 test.

UUT 12140801-4 **GT2000 Patient Table**

MANUFACTURER:	GE Hangwei Medical Systems CO. LTD.
IDENTIFICATION:	Model No.: 5121647-3
DESCRIPTION:	System Component of the LightSpeed VCT System GT2000 N9 Patient Table Test specimen included a simulated patient load of 550 lb. Seismic Kit UUT tested at a height of 35.5".
MOUNTING:	Floor: (4) – 5/8" dia GR 8 bolts w/ GEHC supplied patient table foot assembly.



PROPERTIES:

DIMENSIONS (in.)				LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height	Weight (lb.)	Front-Axis	Side-Axis	Vertical-Axis
25.6	114.5	19.2 / 41.3	1146+550 Patient	7.1	2.7	5.7

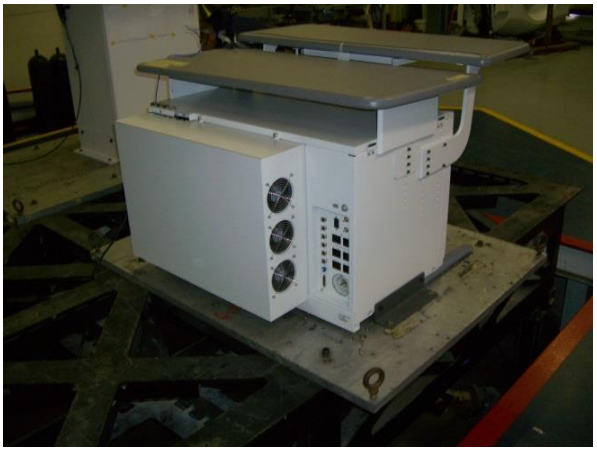
SHAKE TABLE TEST PARAMETERS

CODE	TEST CRITERIA	S_{DS}	z/h	I_P	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2022	ICC-ES AC156-15	2.0 2.5	1 0	1.5	3.2	2.4	1.68	0.68

Unit satisfied AC156 requirements for structural integrity and manufacturer requirements for functionality after AC156 test.

UUT 12131201-1 **GOC6.6 Console**

MANUFACTURER:	General Electric Company
IDENTIFICATION:	Model No.: 5212920-150
DESCRIPTION:	System component of the Discovery CT750 HD System UUT tested with Height set at 34.7" & Depth set to 54.74"
MOUNTING:	Rigid Base (Floor) mounted using: (2) – 3/8" dia. ASTM A574 Socket Head Cap Screws w/ washer through each of two GE mounting brackets to floor plate. (4 anchors total) GE mounting assembly including: (2) Bracket P/N 2330594 Each bracket mounted to cabinet w/: (2) M10 x 20mm Class 12.9 Torque 38.4 Nm (2) M10 Lock Washer (P/N 2203-M10-07) (2) M10 Flat Washer (P/N 2000-M10-03)



PROPERTIES:

DIMENSIONS (in.)				LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height	Weight (lb.)	Side -Axis	Front-Axis	Vertical-Axis
48.74	46.54 / 54.74	26.7 / 34.7	405	6.2	17.3	22.9

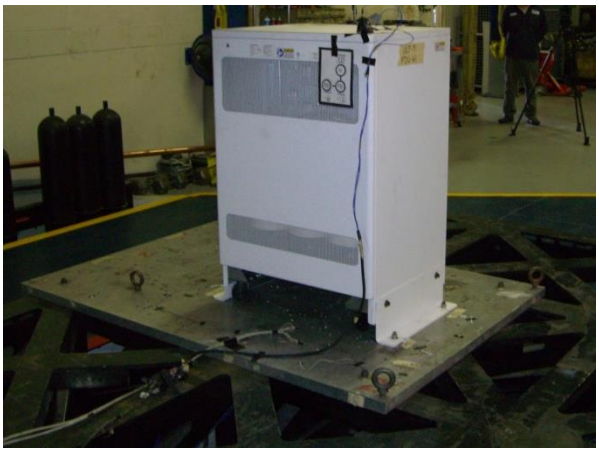
SHAKE TABLE TEST PARAMETERS

CODE	TEST CRITERIA	S_{DS}	z/h	I_P	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2022	ICC-ES AC156-15	2.0 2.6	1.0 0.0	1.5	3.2	2.40	1.74	0.70

Unit satisfied AC156 requirements for structural integrity and manufacturer requirements for functionality after AC156 test.

UUT 12131301-2 **Power Distribution Unit**

MANUFACTURER:	GE Hangwei Medical Systems CO., LTD
IDENTIFICATION:	Model No.: 2326492-61
DESCRIPTION:	System component of the Optima CT580 System
MOUNTING:	Floor mounted using (4) – 3/8" dia. socket head bolts through GEHC supplied mounting brackets to aluminum interface plate.



PROPERTIES:

DIMENSIONS (in.)				LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height	Weight (lb.)	Side-Axis	Front-Axis	Vertical-Axis
27.6	21.7	41.8	796+22 brackets	15.7	19.9	45

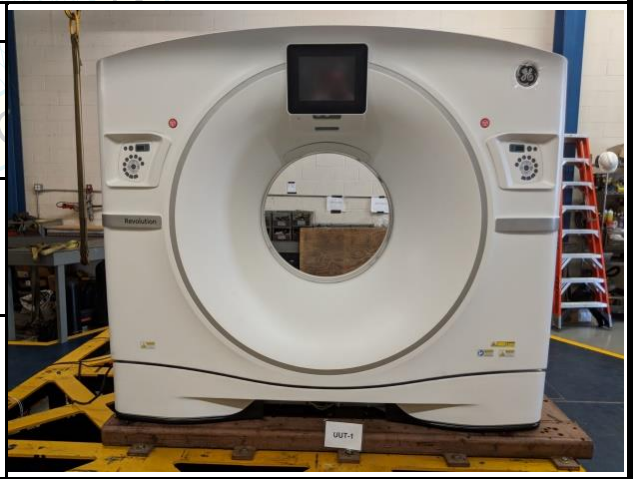
SHAKE TABLE TEST PARAMETERS

CODE	TEST CRITERIA	S_{DS}	z/h	I_P	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2022	ICC-ES AC156-15	2.0 2.6	1.0 0.0	1.5	3.2	2.40	1.74	0.70

Unit satisfied AC156 requirements for structural integrity and manufacturer requirements for functionality after AC156 test.

UUT 12180501-1 **Revolution Frontier Gantry (HDe6)**

MANUFACTURER:	GE Healthcare
IDENTIFICATION:	Model No.: 5232085-203 Serial No.: HDE6G – 002
DESCRIPTION:	Component of the Revolution Frontier CT system. Revolution Gantry (HDe6) Configured with seismic options.
MOUNTING:	Rigid Base (Floor) Mounted using (4) – 5/8" diameter SAE J429 Grade 8 bolts to fixture plate.



DIMENSIONS (in.)				LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height	Weight (lb.)	Longit -Axis	Transv-Axis	Vert-Axis
88.7	41.6	74.8	4061 GE Reported 4141 Measured	9.18	9.18	7.18

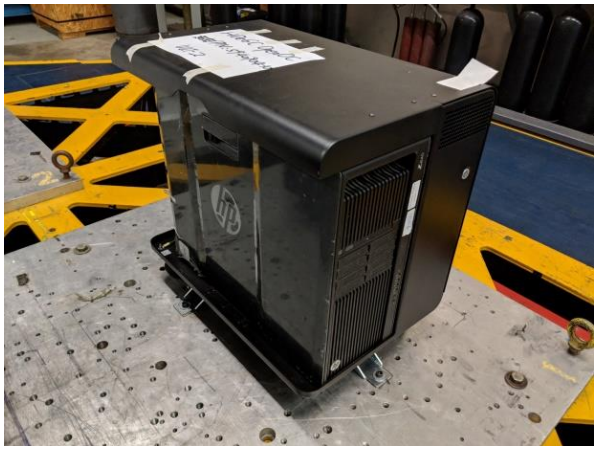
ICC-ES AC156 SHAKE TABLE TEST PARAMETERS — CODE: 2022 CBC

S_{DS} (G)	z/h	I_P	A_{FLX-H} (G)	A_{RIG-H} (G)	A_{FLX-V} (G)	A_{RIG-V} (G)
2.0 2.5	1 0	1.5	3.2	2.4	1.68	0.68

Unit satisfied AC156 requirements for structural integrity and manufacturer requirements for functionality after AC156 test.

UUT 12180501-2 Console Assembly (HDe6)

MANUFACTURER:	GE Healthcare
IDENTIFICATION:	Model No.: 5940904-10 Serial No.: HDe60_002
DESCRIPTION:	Component of the Revolution Frontier CT system. Open style console HP Z840 Computer
MOUNTING:	Rigid Base (Floor) mounted using: GE console to floor mounting assembly (3 locations total): Console Anti Seismic Bracket (P/N 5357148-3) each w/ - (2) – M6 x 16 10.9 Class bolts (Torque = 7.9 N-m) (P/N 2262896-30) - (2) – Flat washers (P/N 2001-M8-02) - (1) – 3/8" dia. ASTM A574 Socket Head Cap Screw w/ washer.



DIMENSIONS (in.)				LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height	Weight (lb.)	Side-Axis	Front-Axis	Vert-Axis
15.7	26.4	22.7	138	14.46	30.24	35.92

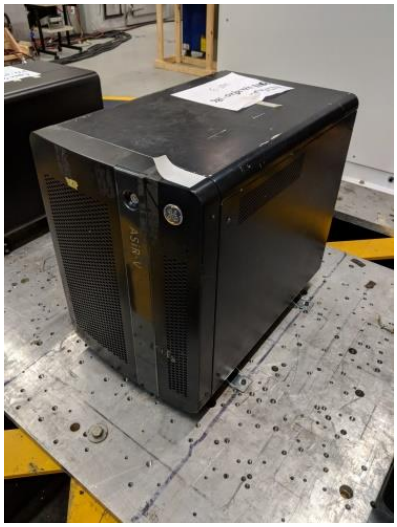
ICC-ES AC156 SHAKE TABLE TEST PARAMETERS — CODE: 2022 CBC

S_{DS} (G)	z/h	I_P	A_{FLX-H} (G)	A_{RIG-H} (G)	A_{FLX-V} (G)	A_{RIG-V} (G)
2.0 2.5	1 0	1.5	3.2	2.4	1.68	0.68

Unit satisfied AC156 requirements for structural integrity and manufacturer requirements for functionality after AC156 test.

UUT 12180501-3 NIO HD64 Console

MANUFACTURER:	GE Healthcare
IDENTIFICATION:	Model No.: 5212920-186 Serial No.: HDe6BO_001
DESCRIPTION:	Component of the Revolution Discovery CT system. NIO style console
MOUNTING:	Rigid Base (Floor) mounted using: GE console to floor mounting assembly (4 locations total): Console Anti Seismic Bracket (P/N 5357148) each w/ - (2) – M6 x 16 10.9 Class bolts (Torque=7.9 N-m) (P/N 2262896-2) - (2) – Flat washers (P/N 2001-M8-02) - (1) – 3/8" dia. ASTM A574 Socket Head Cap Screw w/ washer.



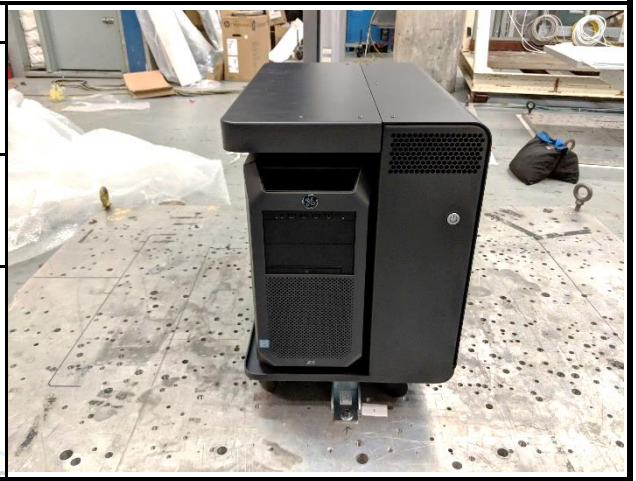
DIMENSIONS (in.)				LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height	Weight (lb.)	Side-Axis	Front-Axis	Vert-Axis
18.5	29	25.8	162.5	14.77	18.32	18.5

ICC-ES AC156 SHAKE TABLE TEST PARAMETERS — CODE: 2022 CBC

S_{DS} (G)	z/h	I_P	A_{FLX-H} (G)	A_{RIG-H} (G)	A_{FLX-V} (G)	A_{RIG-V} (G)
2.0 2.5	1 0	1.5	3.2	2.4	1.68	0.68

Unit satisfied AC156 requirements for structural integrity and manufacturer requirements for functionality after AC156 test.

UUT 1218181-1	Console Assembly
MANUFACTURER:	GE Healthcare
IDENTIFICATION:	Model No.: 5940904-12 Serial No.: 460049CN1
DESCRIPTION:	Component of the Revolution Frontier CT System. HP Z8 Computer mounted in an open style console.
MOUNTING:	Rigid Base (Floor) mounted using: GE console to floor mounting assembly (3 locations total): Console Anti Seismic Bracket (P/N 5357148-3) each w/ - (2) – M6 x 16 flange screw, hexagon socket, black oxide RoHS fastener (Torque=7.9 N-m) (P/N 2262896-30) - (2) – Flat washers (P/N 2001-M8-02) - (1) – 3/8" dia. ASTM A574 Socket Head Cap Screw w/ washer.



DIMENSIONS (in.)				LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height	Weight (lb.)	Side-Axis	Front-Axis	Vert-Axis
15.7	26.4	22.7	142.2	15.12	34.41	48.65

ICC-ES AC156 SHAKE TABLE TEST PARAMETERS						CODE: 2022 CBC
S_{DS} (G)	z/h	I_P	A_{FLX-H} (G)	A_{RIG-H} (G)	A_{FLX-V} (G)	A_{RIG-V} (G)
2.0 2.5	1 0	1.5	3.2	2.4	1.68	0.68

Unit satisfied AC156 requirements for structural integrity and manufacturer requirements for functionality after AC156 test.