

Vibrations test following ANSI C 136-31 Standard

General information

Subject : VOLTANA EVO 1 - Side entry

Asked by : LERHO Xavier

Created on : 26/05/2021

Started on : 26/05/2021

Test number : D210532

Reference norm : ANSI C 136-31 Standard

Folder : P-F21002

Test conditions

Luminaire : VOLTANA EVO 1

Operator : External Lab

Type of Test : ANSI C 136-31 Bridge and Overpass application (3G)

Fixing type : Side-entry

Screw type : M8

Tightening torque (Nm): luminaire : 14

Test date : 19/01/2021

Testing facility : External-Ecotech Bosch Lab University

External test report reference : B_ECO_VJK_21003_Vol tana 0 EVO
1_ANSI_2mod_en

Conclusion



Success

Conclusion :

According to ANSI C136-31 (2018) and Schröder GDE-GUI-007:

VOLTANA EVO1 complies with vibration test following the ANSI 3G protocol.

Validated by :

LERHO Xavier

Duplicate to : RACANELLI Frank, SZÜGYI János Péter,
HORVÁTH Csaba, CSIKÓS Balázs, BEDŐ Péter, VYVEY
Morgan

LAB : 21/06/2021

D210532

1/2

Test(s) details

Test(s)

Name	Description	Verdict
ANSI C136-31 (3g) - Axis Y	ANSI C136-31 "Bridge and Overpass Application" and Schröder GDE-GUI-007 Amplitude: 3g Duration: 100.000 cycles	Informative
ANSI C136-31 (3g) - Axis Z	ANSI C136-31 "Bridge and Overpass Application" and Schröder GDE-GUI-007 Amplitude: 3g Duration: 100.000 cycles	Informative
ANSI C136-31 (3g) - Axis X	ANSI C136-31 "Bridge and Overpass Application" and Schröder GDE-GUI-007 Amplitude: 3g Duration: 100.000 cycles	Informative

Number of appendix pages : 33

End of test report :



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TEST REPORT



**B_ECO_VJK_21003_Vol
tana EVO
1_ANSI_2mod_en**

Subject: **Voltana EVO 1 luminaire**

Body: 01-83-485, P1598 Voltana gen 2 0 Body, B.0, FOT
Cover: 01-83-486, P1598 Voltana gen 2 0 Cover, A.2, FOT
Fixation: 02-23-172, Clamp fixation III, A.2
Fixing screws: 2x M8 14Nm

From: HUS - Hungarian Schreder

Testing protocol: **"Street Lighting Luminaires" ANSI C 136-31 Standard (3g)**

Remarks: -

TEST CONDITIONS:

Operators: Gábor Neukum
Péter Hajnal

IEC Standard

Tightening torque M8 bolt(s): 14 Nm



Test and results:

See attached report for all details
ECO_VJK_21003_Voltana EVO 1_ANSI_2mod_en

CONCLUSIONS:

The luminaire consisting of parts mentioned above was able to withstand the ANSI standard's vibration test in the form provided to us by the customer.

Duplicate to: Tamás Dörflinger

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ANSI C 136-31 Standard (3g) vibration test of a(n) “Voltana EVO 1” luminaire		
Customer (name&address): Schröder Magyarország Zrt. 2084 Pilisszentiván Tópart 2.	Contractor (name&address): Dunaújvárosi Egyetem H-2400 Dunaújváros, Táncsics Mihály st. 1/a.	Executive organization (name&address): Ecotech Szolgáltató Nonprofit Zrt. H-2400 Dunaújváros, Táncsics Mihály st. 1/a.
Test location: Ecotech Nonprofit Zrt. Műszaki Igazgatóság Élettartam Vizsgáló laboratórium	Operator(s): Gábor Neukum Péter Hajnal	

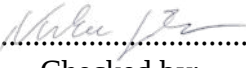
Quotation: -	Order number: -	Contract number: FI60345
Applied standard: ANSI C 136-31(3g)	Project number: B_ECO_21003	
Sample arrival: 2021.01.18.	Test started: 2021.01.19.	Test ended: 2021.01.20.
Number of samples: 1		
Sample serial number: S0386		
Test task: Vibration tests		
Test subject: Voltana EVO 1		

We call the attention that the results of the test only apply to the tested samples. This report is only valid and can only be copied in its full form and content.

Date: Dunaújváros, 2021.02.11.



 Made by:
Péter Hajnal
 Head of Maintenance



 Checked by:
Gábor Neukum
 Chief Operator



 Approved by:
Gábor Pór
 Technical Director

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B_ECO_NY_08_02_2k_5mod		1. oldal (33)



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1. Introduction

1.1. Subject

The test is designed to determine whether the luminaire is able to withstand vibration conditions that may be encountered in normal installations.

1.2. Sample fixation

Adapter to Shaker:

- 14 pieces of M8x45 bolts
- 25Nm tightening torque

DUT to Adapter

- Tightening torque M8 bolts: 14 Nm

1.3. Abbreviations

Abbreviation	Meaning
CoG	Center of Gravity
DUT	Device Under Test
N/A	Not applicable
CTRL	Control
DoF	Degrees of Freedom
RSTD	Resonance Search Track and Dwell

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2. Sample

Device under test (DUT): Voltana EVO 1 (previously called Voltana 0 GEN 2)
Manufacturer: Schröder Magyarország Zrt.
Manufacturing year: 2020

3. Vibration test

3.1. Equipment

Equipment details		
Equipment name	Shaker II. (LDS)	Slip Table
Equipment type	V875-440-SPA40K	HBT750-SB-V875
Equipment nr.	B_ECO_003	B_ECO_059
Serial nr.	1023471/1 13621-000010/1	349766/1
Calibration nr. (date)	CAS-458024-V2C0G9 (2020.07.23)	CAS-400197-V2F6S9 (2019.08.14)

Equipment name	Brüel&Kjaer Accelerometer	Brüel&Kjaer Accelerometer
Equipment type	Type 4526	Type 4533-B
Equipment nr.	B_ECO_086	B_ECO_088
Serial nr.	30928	33696
Calibration nr. (date)	00618-085 (2020.07.07)	150157.3 (2020.11.25)

Equipment name	PCB Accelerometer	PCB Accelerometer
Equipment type	356B21	356B21
Equipment nr.	B_ECO_010	B_ECO_012
Serial nr.	LW121008	LW121010
Calibration nr. (date)	00618-010 (2020.07.07)	00618-012 (2020.07.07)

Equipment name	Control unit (LDS)	Control unit (LDS)
Equipment type	LAS200	LAS210
Equipment nr.	B_ECO_023	B_ECO_024
Serial nr.	9098119	9289610
Calibration nr. (date)	ECO_KJB_20_023_024 (2020.01.30)	ECO_KJB_20_023_024 (2020.01.30)

Signal conditioner was not used in the given test.

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3.2. Applied standard

“Bridge and Overpass Application” ANSI C136.31	
Test Item	Luminaire for bridge and overpass applications
Excitation Direction	3 directions
Search for frequencies and quality factor Q	Excitation: sine sweep Frequency band: 5 - 100 Hz Sweep speed: 1 octave/min. Acceleration: 0.5g Control point : Fixation to the pole
Test	Excitation: sine dwell Frequency: at or near f_0 Amplitude : 3.0g Control point : Centre of gravity Duration: 100,000 cycles
N.B.	A separate sample luminaire may be used for each excitation direction
Control of frequencies and quality factor Q	Excitation: sine sweep Frequency band: 5 - 100 Hz Sweep speed: 1 octave/min. Acceleration: 0.5g Control point : Fixation to the pole

3.3. Test parameters – execution

- Environmental temperature: 24 [°C]
- Test type: Passive
- Test direction: X; Y; Z directions

4. Time logs

RSTD Search Log (X direction)					
Swept Sine	Freq.(Hz) 100	Trans. 1.69	Phase -3.71	Q 3.9	Random Done
Sweep	Time	History			
	00:00:02	Start searching at 5.00 Hz with transmissibility6,14(f)			
	00:04:25	End searching at 100.00 Hz			
	00:05:27	Add resonance at 100.00 Hz			
	00:05:45	Start dwell at 100.00 Hz			
	00:22:28	End dwell at 100.00 Hz Full level elapsed sine cycles: 100139.6			

RSTD Search Log (Y direction)					
Swept Sine	Freq.(Hz) 100.00	Trans. 41.52	Phase -257.17	Q 42.9	Dwell Done
Sweep	Time	History			
	00:00:02	Start searching at 5.00 Hz with transmissibility7,14(f)			
	00:04:24	End searching at 100.00 Hz			
	00:04:59	Add resonance at 100.00 Hz			
	00:05:04	Start dwell at 100.00 Hz			
	00:21:46	End dwell at 100.00 Hz Full level elapsed sine cycles: 109008.9			

RSTD Search Log (Z direction)					
Swept Sine	Freq.(Hz) 100.00	Trans. 5.13	Phase -2.79	Q 15.9	Dwell Done
Sweep	Time	History			
	00:00:02	Start searching at 5.00 Hz with transmissibility8,14(f)			
	00:04:25	End searching at 100.00 Hz			
	00:12:40	Add resonance at 100.00 Hz			
	00:13:27	Start dwell at 100.00 Hz			
	00:30:09	End dwell at 100.00 Hz Full level elapsed sine cycles: 108234.7			

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Input acceleration to reach 3g in CoG			
	Direction		
	X	Y	Z
Frequency	100.00Hz	100.00Hz	100.00Hz
Transmissibility	1.69	41.52	5.13
RSTD input acceleration	1.5g	0.102g	0.5g
Expected CoG acceleration	2.54g±correction (see run log)	4.23g±correction (see run log)	2.565g±correction (see run log)

The sine dwelling tests started off with feedback accelerations mentioned in the table above. Those values are within the range where it's possible to manually adjust the input acceleration in order to receive a value in the center of gravity that is -for the full duration of the test- within the required 3g acceleration $\pm 10\%$. Ensuring this is only possible with manual adjustments (see run log section of the report) and is the operator's responsibility.

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4.1. Photos of the setup

4.1.1. X direction

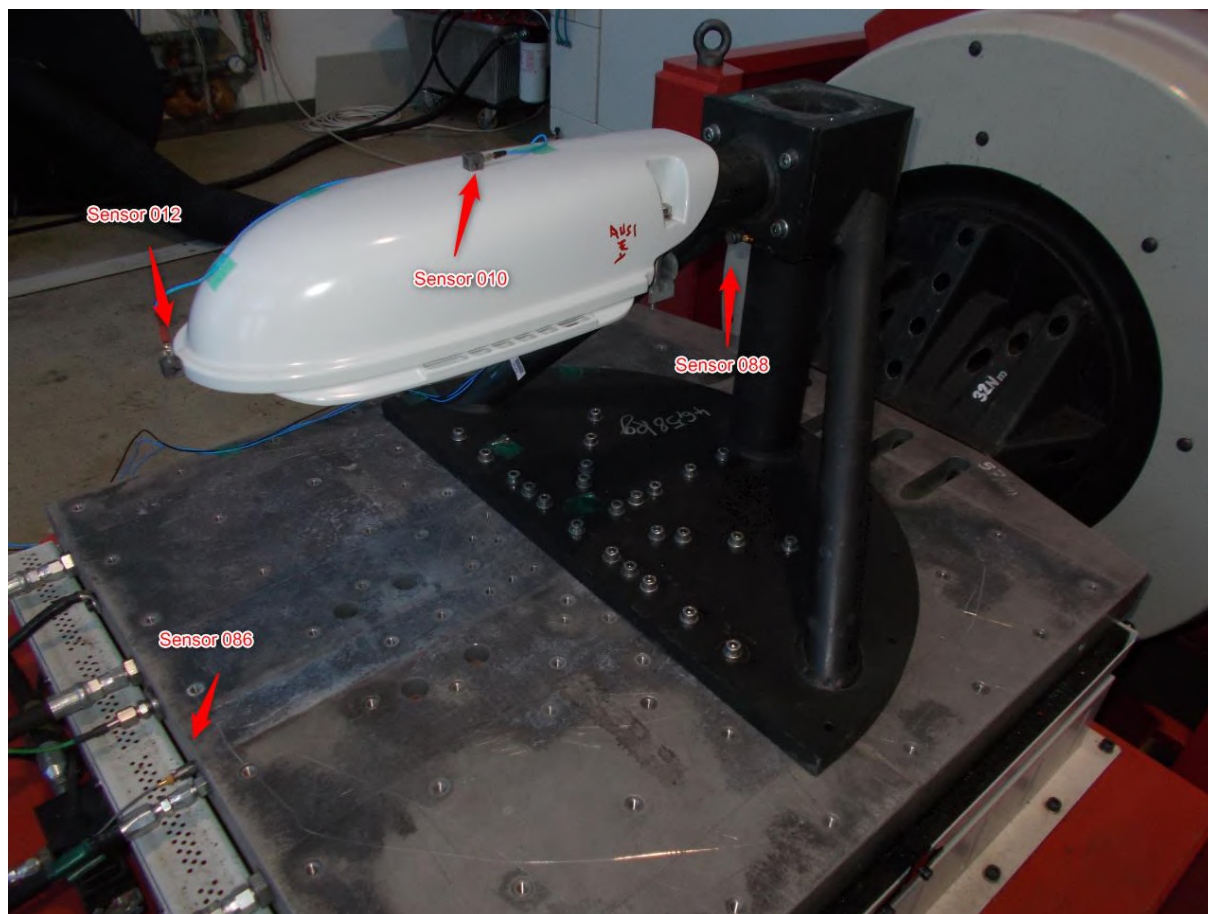


Figure 1
Sensor locations in the X direction

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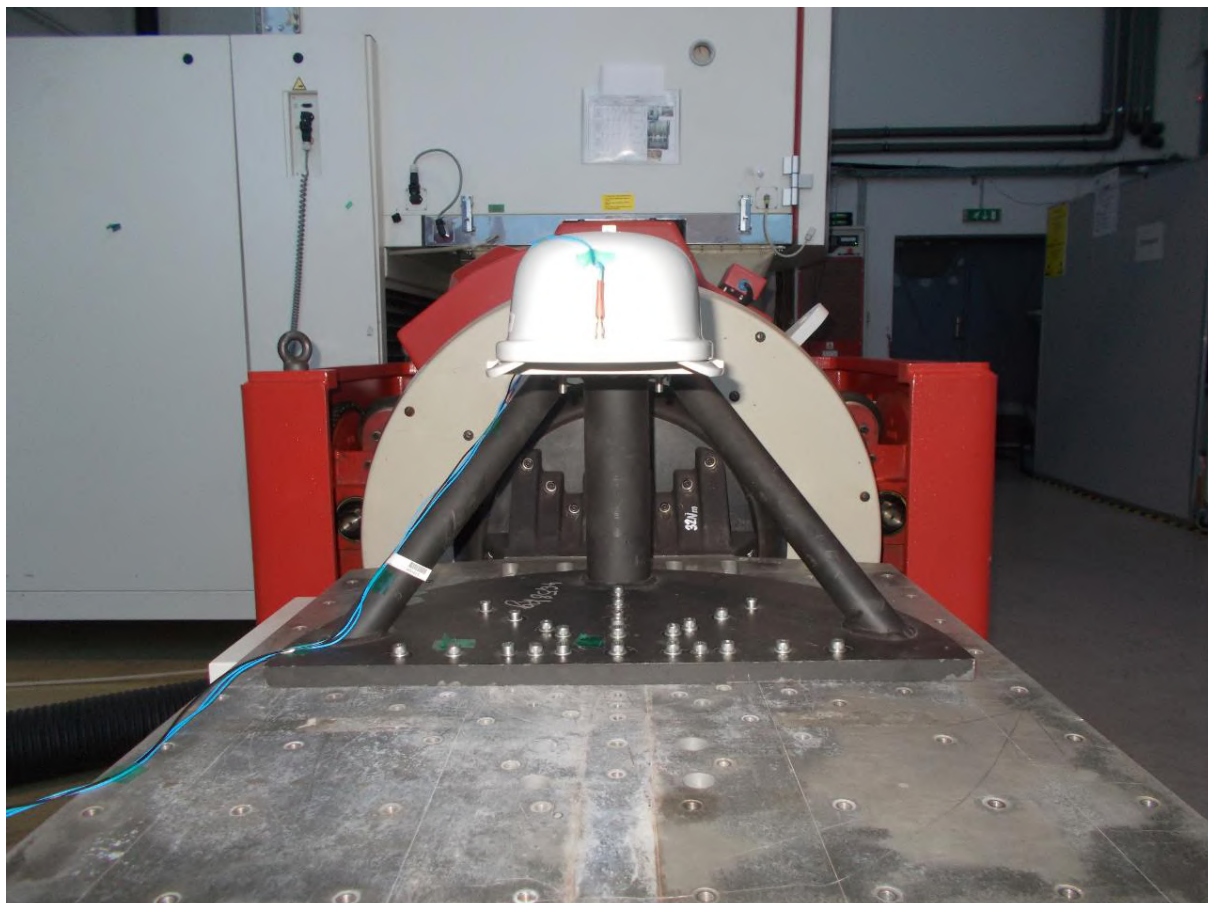
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2. Figure
Front view

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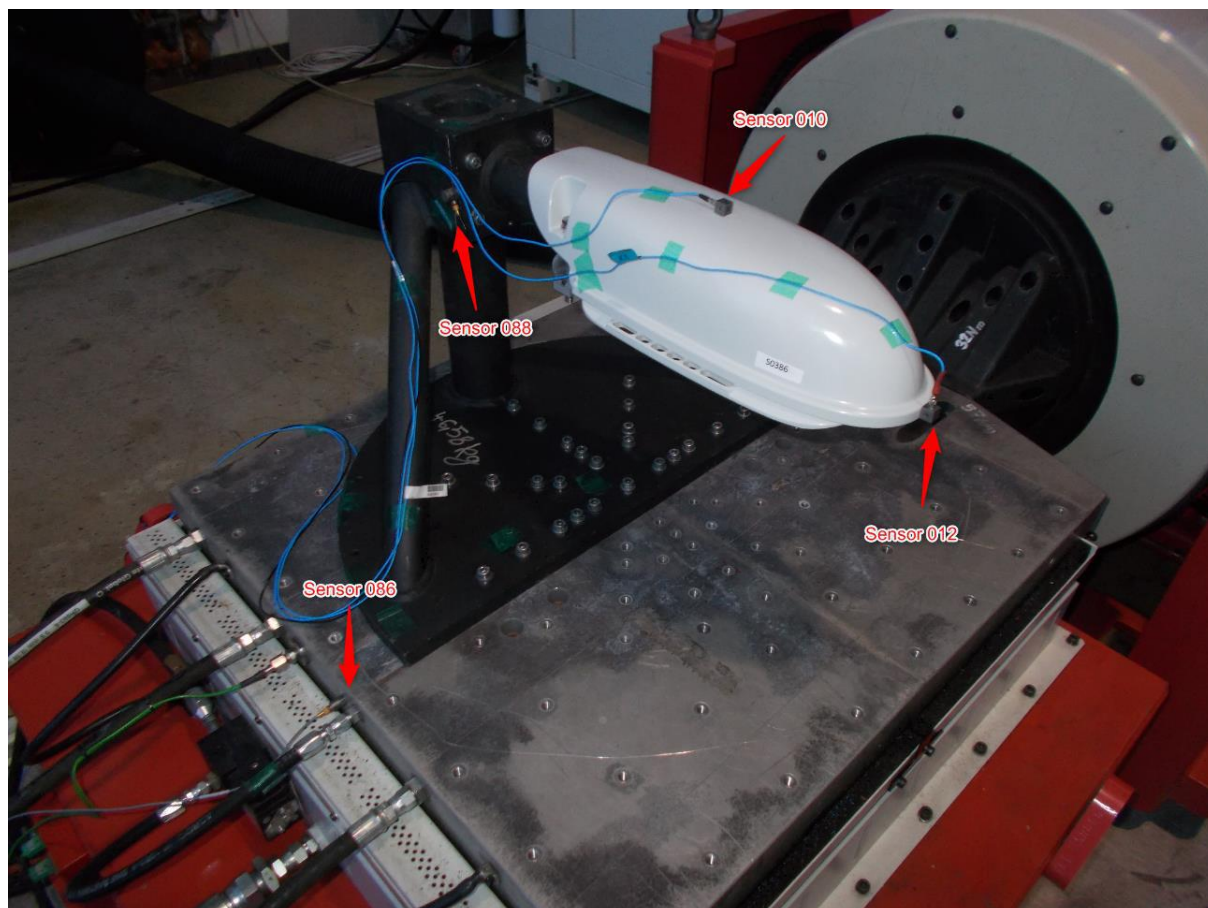
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4.1.2. Y direction



3. Figure
Sensor locations in Y direction

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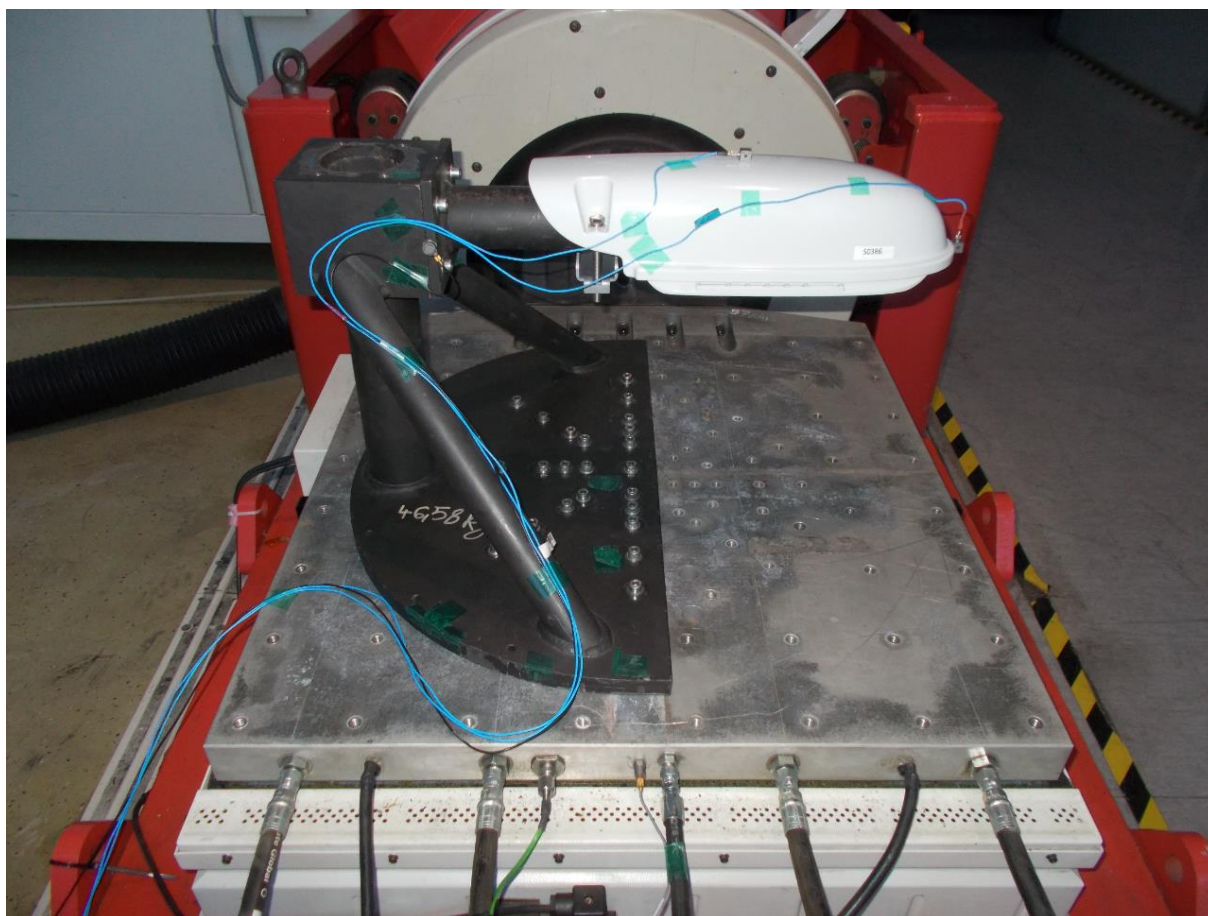
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4. Figure
Side view

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11. oldal (33)



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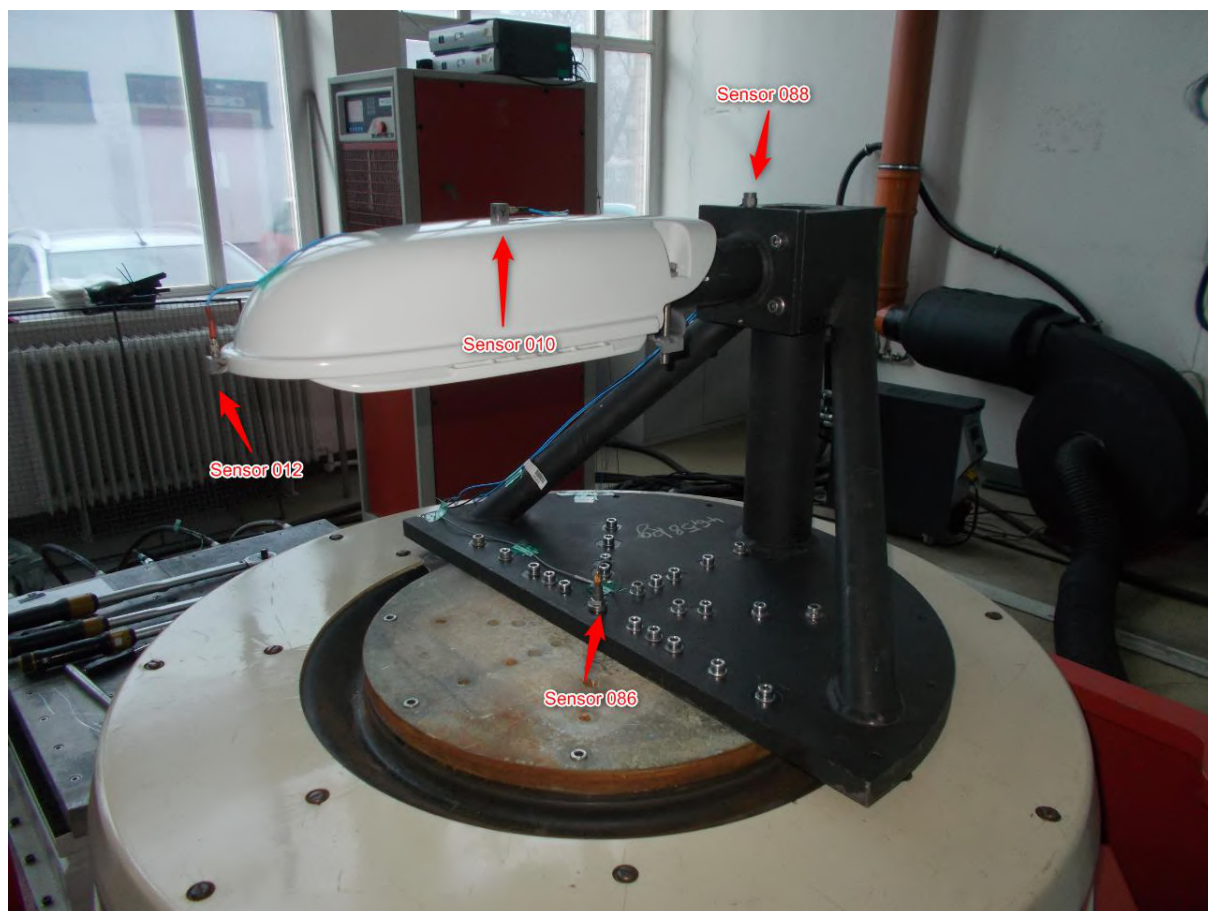
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4.1.3. Z direction



5. Figure
Sensor locations in Z direction

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6. Figure
Side view

4.2. Test profiles

Resonant frequency search (sweep) Profile Table						
Frequency	Acceleration	Velocity	Displacement	Segment Type	High Abort	High Alarm
Hz	(gn) Peak	(m/s) Peak	(mm) Peak-Peak		dB	dB
5.0	0.5	0.156078	9.93621	Const. Ampl.	6.00	3.00
100.0	0.5	0.00780388	0.0248405		6.00	3.00

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4.3. X direction results

The DUT did not have its fundamental resonance in the examined frequency range in this direction. The standard instructs to run the dwelling at or near the resonant frequency. Since that frequency tends to be above 100Hz, it was selected as dwelling frequency.

Project File Name: ANSI C 136-31-1.prj
Profile Name: ANSI C 136-31-1
Test Type: Resonance Search, Track And Dwell
Run Folder: .\B_ECO_21003_Voltana 0 GEN 2_ANSI_X_1.5g_sweep_before Jan
20, 2021 11-42-46

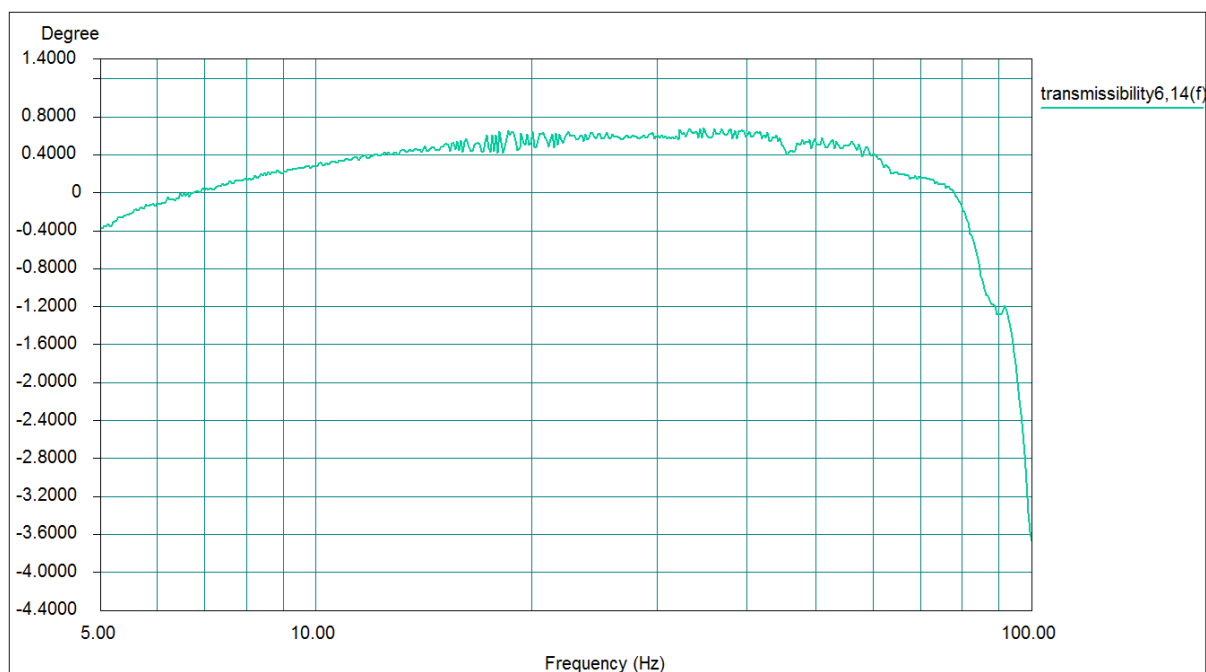


Figure 7
RSTD Search Log (X direction), phase of transmissibility between CoG(6) and CTRL(14)

Level: 100 %
Frequency: 99.948158 Hz

Full Level Time: 00:04:20
Time Remaining: 00:00:00

SweepType: Logarithmic
Sweep Rate: 1 Oct/Min

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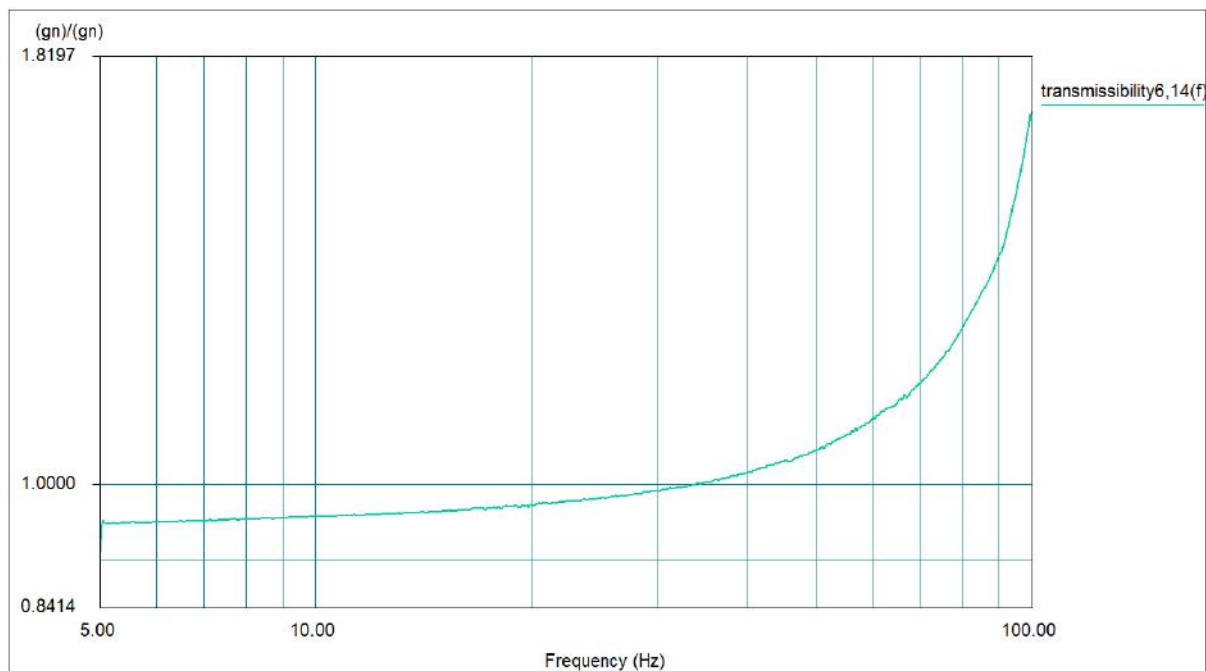


Figure 8

RSTD Search Log (X direction), amplitude ratio of transmissibility between CoG(6) and CTRL(14)

Input Channel Parameters

Input	Type	Analysis	Max. Volts	mv/(EU)	Weighting	Coupling	Quantity	I.D.	Location
1	Response	Filter	1.0	9.8090mv/(gn)	1.0000	ICP	Acce.	088	Consloe
6	Response	Filter	1.0	9.7000mv/(gn)	1.0000	ICP	Acce.	010x	
7	Response	Filter	1.0	10.0200mv/(gn)	1.0000	ICP	Acce.	010y	CoG
8	Response	Filter	1.0	9.6700mv/(gn)	1.0000	ICP	Acce.	010z	
10	Response	Filter	1.0	9.8900mv/(gn)	1.0000	ICP	Acce.	012x	
11	Response	Filter	1.0	9.9600mv/(gn)	1.0000	ICP	Acce.	012y	Tip
12	Response	Filter	1.0	9.7300mv/(gn)	1.0000	ICP	Acce.	012z	
14	Control	Filter	1.0	93.9700mv/(gn)	1.0000	ICP	Acce.	086	Table

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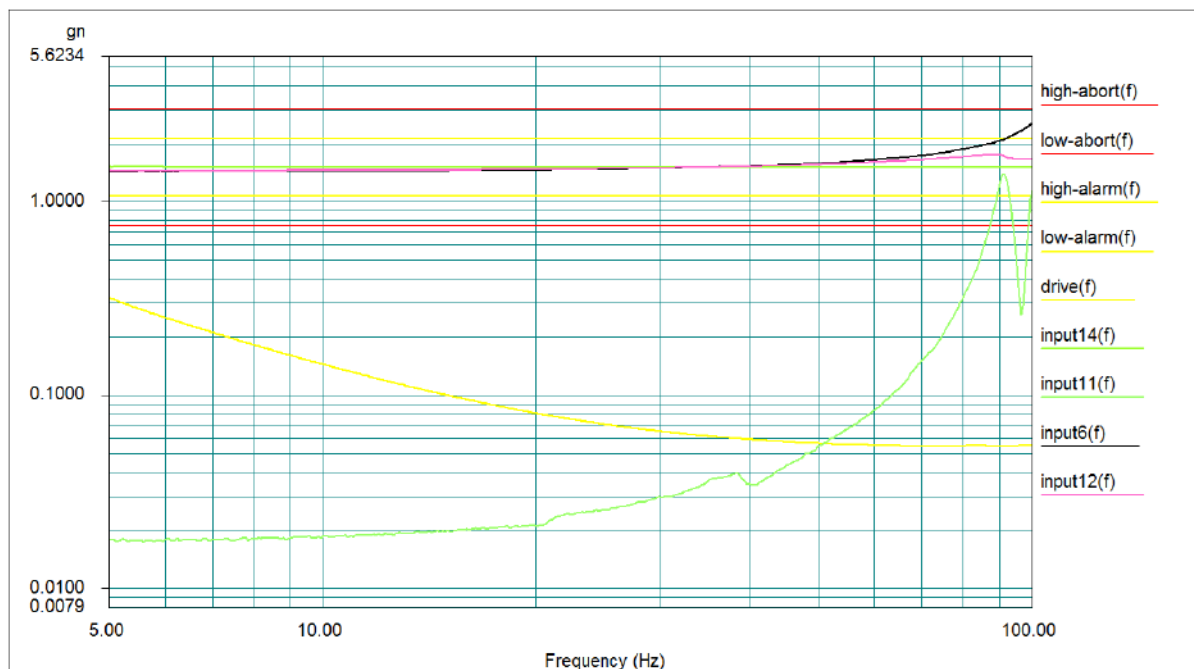


Figure 9
RSTD Search Log (X direction)

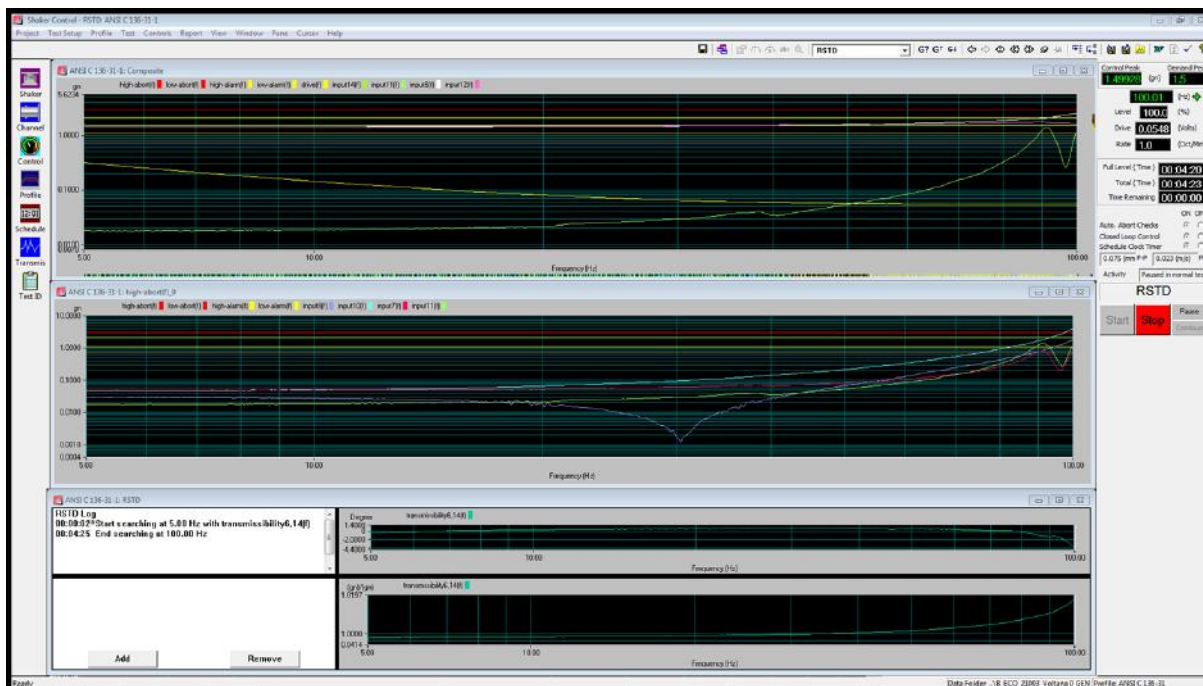


Figure 10
RSTD test control panel X direction

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RSTD Resonance List

Res#	Freq.(Hz)	Trans.	Phase	Q	Dwell	Elapsed
1	100.00	1.69	-3.71	3.9	Done	00:16:39

RSTD Search Log

Time	Event
00:00:02	Start searching at 5.00 Hz with transmissibility6,14(f)
00:04:25	End searching at 100.00 Hz
00:05:27	Add resonance at 100.00 Hz
00:05:45	Start dwell at 100.00 Hz
00:22:28	End dwell at 100.00 Hz

Run Log

Dactron Dual DSP Shaker Control System				
Swept Sine Test Run Log				
11:42:46, Wednesday, January 20, 2021				
ENTRY TIME	FREQ(Hz)	CTL/DEMAND(P eak)	SOURCE	DESCRIPTION
11:42:46, Jan 20, 21	0.00		User Command	Start the Test
11:42:48, Jan 20, 21	5.00		Controller	Start a new sweep/dwell entry
11:47:12, Jan 20, 21	100.01	1.499/ 1.500 gn	Controller	Paused in scheduled test
11:47:12, Jan 20, 21	100.01		Controller	'control(f),drive(f),Hin (f),profile(f),high- abort(f),low- abort(f),high- alarm(f),low- alarm(f),controlUp(f),c ontrolDown(f),shaker_a cc(f),shaker_vel(f),shak er_disp(f),control(t),fre quency(t),input6(t),inpu t_hist6(t),input7(t),input _hist7(t),input8(t),input _hist8(t),input6(f),input 6Up(f),input6Down(f),i nput7(f),input7Up(f),in

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17. oldal (33)



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				put7Down(f),input8(f),input8Up(f),input8Down(f),input1(t),input_hist1(t),input10(t),input_hist10(t),input11(t),input_hist11(t),input12(t),input_hist12(t),input14(t),input_hist14(t),input1(f),input1Up(f),input1Down(f),input10(f),input10Up(f),input10Down(f),input11(f),input11Up(f),input11Down(f),input12(f),input12Up(f),input12Down(f),input14(f),input14Up(f),input14Down(f),' Saved Signals
11:48:32, Jan 20, 21	100.01		User Command	Resume(Continue) the Drive output
11:48:32, Jan 20, 21	100.00		Controller	Start a new sweep/dwell entry
12:03:54, Jan 20, 21	100.00		User Command	Set Level to 104%
12:05:15, Jan 20, 21	100.00		Controller	All Panes saved to the disk.
12:05:15, Jan 20, 21	100.00		Controller	'control(f),drive(f),Hinv(f),profile(f),high-abort(f),low-abort(f),high-alarm(f),low-alarm(f),controlUp(f),controlDown(f),shaker_acc(f),shaker_vel(f),shaker_disp(f),control(t),frequency(t),input6(t),input_hist6(t),input7(t),input_hist7(t),input8(t),input_hist8(t),input6(f),input6Up(f),input6Down(f),input7(f),input7Up(f),input7Down(f),input8(f),input8Up(f),input8Down(f),input1(t),input_hist1(t),input10(t),input_hist

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				10(t),input11(t),input_hist11(t),input12(t),input_hist12(t),input14(t),input_hist14(t),input1(f),input1Up(f),input1Down(f),input10(f),input10Up(f),input10Down(f),input11(f),input11Up(f),input11Down(f),input12(f),input12Up(f),input12Down(f),input14(f),input14Up(f),input14Down(f),' Saved Signals
12:05:16, Jan 20, 21	0.00	1.575/ 1.575 gn	Controller	End of Test
12:05:16, Jan 20, 21	0.00			Full level elapsed 00:19:39
12:05:16, Jan 20, 21	0.00			Full level elapsed sine cycles: 100139.6

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19. oldal (33)

4.4. Y direction results

The DUT did not have its fundamental resonance in the examined frequency range in this direction. The standard instructs to run the dwelling at or near the resonant frequency. Since that frequency tends to be above 100Hz, it was selected as dwelling frequency.

Project File Name: ANSI C 136-31-1.prj
 Profile Name: ANSI C 136-31-1
 Test Type: Resonance Search, Track And Dwell
 Run Folder: .\B_ECO_21003_Voltana 0 GEN 2_ANSI_Y_0.1g_sweep_before Jan 20, 2021 10-33-21

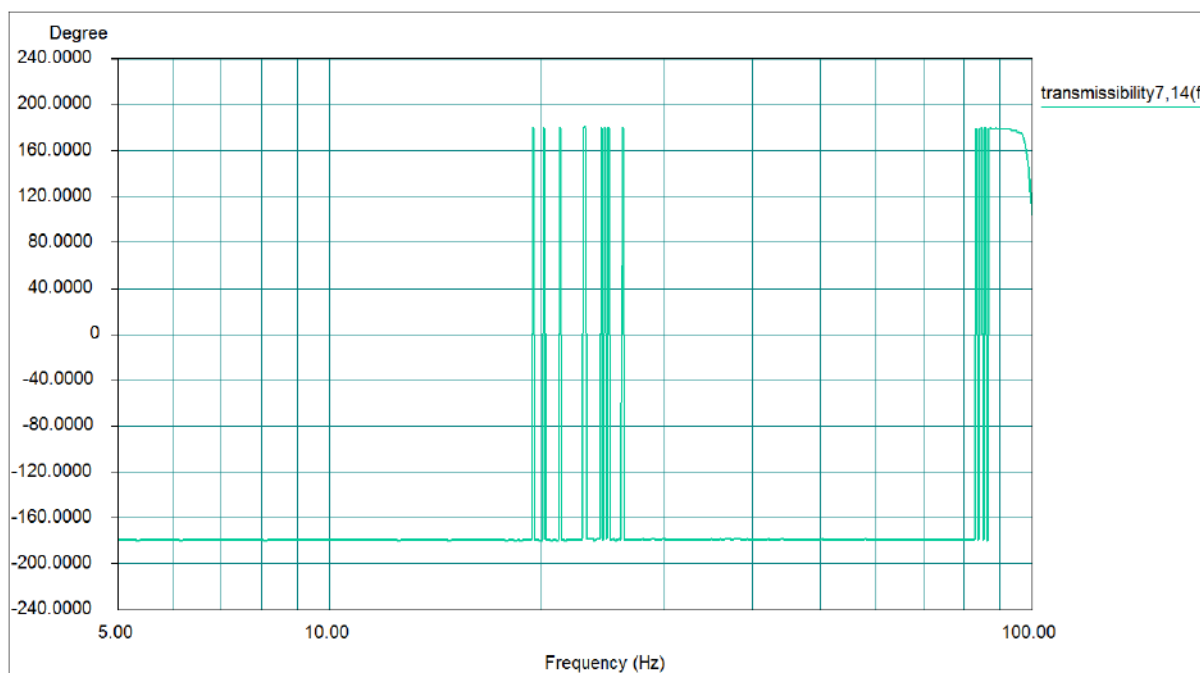


Figure 11
 RSTD Search Log (Y direction), phase of transmissibility between CoG(7) and CTRL(14)

Level: 100 %
 Frequency: 99.985077 Hz

Full Level Time: 00:04:20 SweepType: Logarithmic
 Time Remaining: 00:00:00 Sweep Rate: 1 Oct/Min



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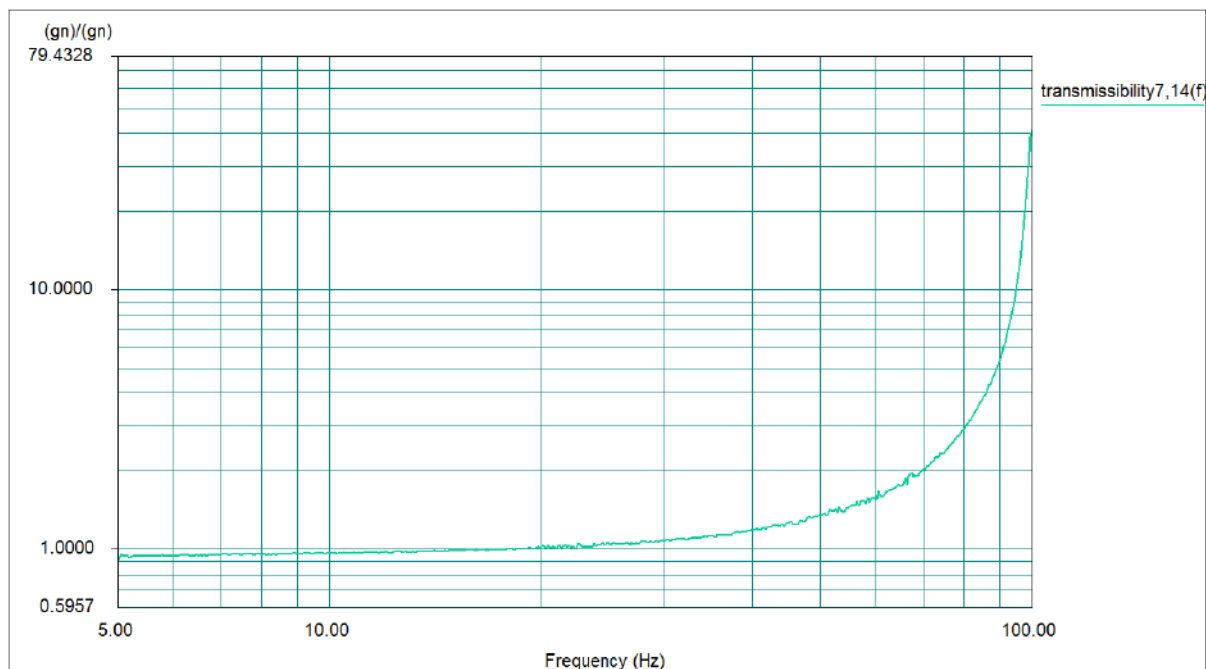


Figure 12

RSTD Search Log (Y direction), amplitude ratio of transmissibility between CoG(7) and CTRL(14)

Input Channel Parameters

Input	Type	Analysis	Max. Volts	mv/(EU)	Weighting	Coupling	Quantity	I.D.	Location
1	Response	Filter	1.0	9.8090mv/(gn)	1.0000	ICP	Acce.	088	Consloe
6	Response	Filter	1.0	9.7000mv/(gn)	1.0000	ICP	Acce.	010x	
7	Response	Filter	1.0	10.0200mv/(gn)	1.0000	ICP	Acce.	010y	CoG
8	Response	Filter	1.0	9.6700mv/(gn)	1.0000	ICP	Acce.	010z	
10	Response	Filter	1.0	9.8900mv/(gn)	1.0000	ICP	Acce.	012x	
11	Response	Filter	1.0	9.9600mv/(gn)	1.0000	ICP	Acce.	012y	Tip
12	Response	Filter	1.0	9.7300mv/(gn)	1.0000	ICP	Acce.	012z	
14	Control	Filter	1.0	93.9700mv/(gn)	1.0000	ICP	Acce.	086	Table

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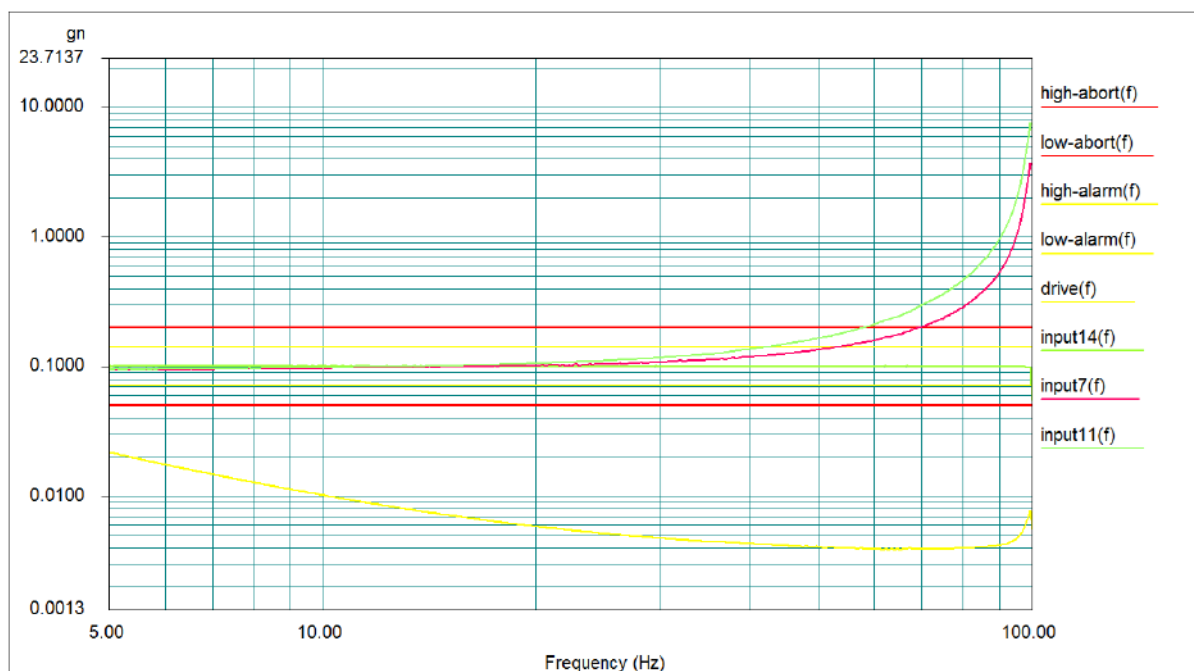


Figure 13
RSTD Search Log (Y direction)

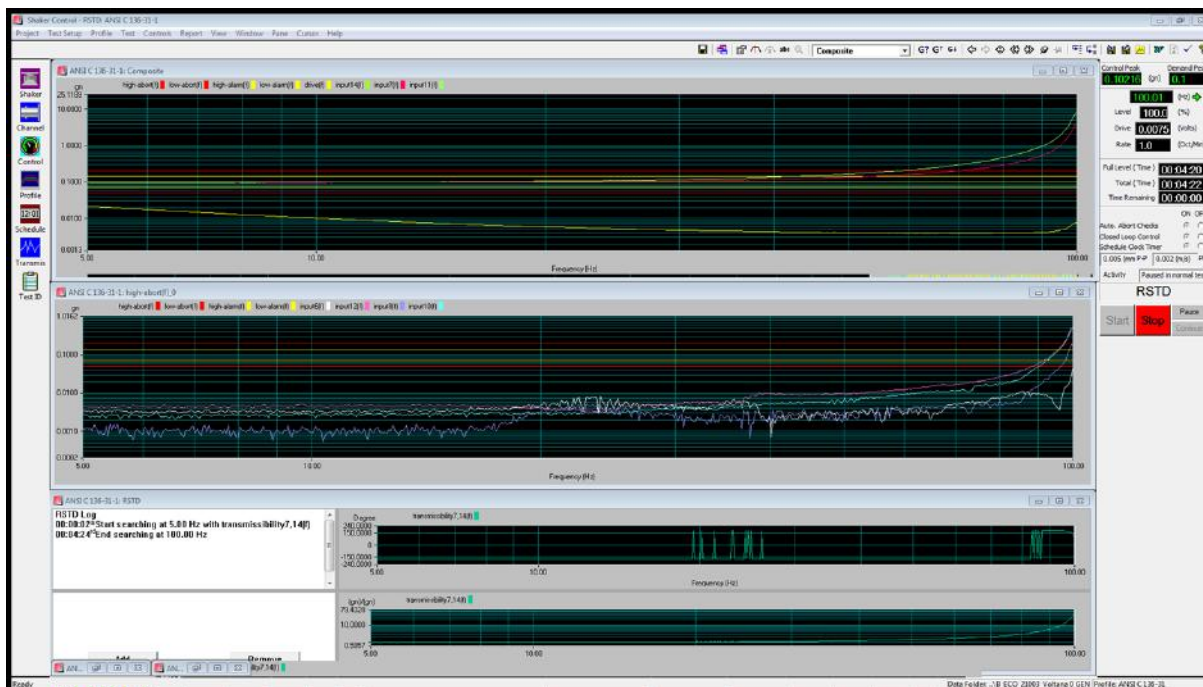


Figure 14
RSTD test control panel Y direction

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**B_ECO_VJK_21003_Vol
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1_ANSI_2mod_en**

RSTD Resonance List

Res#	Freq.(Hz)	Trans.	Phase	Q	Dwell	Elapsed
1	100.00	41.52	-257.17	42.9	Done	00:16:39

RSTD Search Log

Time	Event
00:00:02	Start searching at 5.00 Hz with transmissibility 7,14(f)
00:04:24	End searching at 100.00 Hz
00:04:59	Add resonance at 100.00 Hz
00:05:04	Start dwell at 100.00 Hz
00:21:46	End dwell at 100.00 Hz

Run Log

Dactron Dual DSP Shaker Control System				
Swept Sine Test Run Log				
10:33:23, Wednesday, January 20, 2021				
ENTRY TIME	FREQ(Hz)	CTL/DEMAND(Peak)	SOURCE	DESCRIPTION
10:33:23, Jan 20, 21	0.00		User Command	Start the Test
10:33:25, Jan 20, 21	5.00		Controller	Start a new sweep/dwell entry
10:37:47, Jan 20, 21	100.01	0.102/ 0.100 gn	Controller	Paused in scheduled test
10:37:48, Jan 20, 21	100.01		Controller	'control(f),drive(f),Hinv(f),profile(f),high-abort(f),low-abort(f),high-alarm(f),low-alarm(f),controlUp(f),controlDown(f),shaker_acc(f),shaker_vel(f),shaker_disp(f),control(t),frequency(t),input6(t),input_hist6(t),input7(t),input_hist7(t),input8(t),input_hist8(t),input6(f),input6Up(f),input6Down(f),input7(f),input7Up(f),input7Down(f),input8(f),input8Up(f),input8Down

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1_ANSI_2mod_en

				(f),input1(t),input_hist1(t),input10(t),input_hist10(t),input11(t),input_hist11(t),input12(t),input_hist12(t),input14(t),input_hist14(t),input1(f),input1Up(f),input1Down(f),input10(f),input10Up(f),input10Down(f),input11(f),input11Up(f),input11Down(f),input12(f),input12Up(f),input12Down(f),input14(f),input14Up(f),input14Down(f),transmissibility7,14(f),coherence7,14(f),' Saved Signals
10:38:28, Jan 20, 21	100.01		User Command	Resume(Continue) the Drive output
10:38:28, Jan 20, 21	100.00		Controller	Start a new sweep/dwell entry
10:38:37, Jan 20, 21	100.00		User Command	Set Level to 94%
10:38:43, Jan 20, 21	100.00		User Command	Set Level to 89%
10:38:53, Jan 20, 21	100.00		User Command	Set Level to 85%
10:38:58, Jan 20, 21	100.00		User Command	Set Level to 80%
10:39:14, Jan 20, 21	100.00		User Command	Set Level to 75%
10:39:22, Jan 20, 21	100.00		User Command	Set Level to 69%
10:39:26, Jan 20, 21	100.00		User Command	Set Level to 64%
10:39:30, Jan 20, 21	100.00		User Command	Set Level to 60%
10:41:35, Jan 20, 21	100.00		User Command	Set Level to 55%
10:55:09, Jan 20, 21	100.00		Controller	All Panes saved to the disk.
10:55:10, Jan 20, 21	100.00		Controller	'control(f),drive(f),Hinv(f),profile(f),high-abort(f),low-

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				abort(f),high- alarm(f),low- alarm(f),controlUp(f),c ontrolDown(f),shaker_a cc(f),shaker_vel(f),shak er_disp(f),control(t),fre quency(t),input6(t),inpu t_hist6(t),input7(t),input _hist7(t),input8(t),input _hist8(t),input6(f),input 6Up(f),input6Down(f),i nput7(f),input7Up(f),in put7Down(f),input8(f),i nput8Up(f),input8Down (f),input1(t),input_hist1 (t),input10(t),input_hist 10(t),input11(t),input_h ist11(t),input12(t),input _hist12(t),input14(t),inp ut_hist14(t),input1(f),in put1Up(f),input1Down(f),input10(f),input10Up (f),input10Down(f),inp ut11(f),input11Up(f),in put11Down(f),input12(f ,input12Up(f),input12 Down(f),input14(f),inp ut14Up(f),input14Down (f),transmissibility7,14(f),coherence7,14(f),' Saved Signals
10:55:10, Jan 20, 21	0.00	0.055/ 0.055 gn	Controller	End of Test
10:55:10, Jan 20, 21	0.00			Full level elapsed 00:04:27
10:55:10, Jan 20, 21	0.00			Full level elapsed sine cycles: 109008.9

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tana 0 EVO
1_ANSI_2mod_en

4.5. Z direction results

The DUT did not have its fundamental resonance in the examined frequency range in this direction. The standard instructs to run the dwelling at or near the resonant frequency. Since that frequency tends to be above 100Hz, it was selected as dwelling frequency.

Project File Name: ANSI C 136-31-1.prj
Profile Name: ANSI C 136-31-1
Test Type: Resonance Search, Track And Dwell
Run Folder: .\B_ECO_21003_Voltana 0 GEN 2_ANSI_Z_0.5g_sweep_before Jan
19, 2021 13-13-34

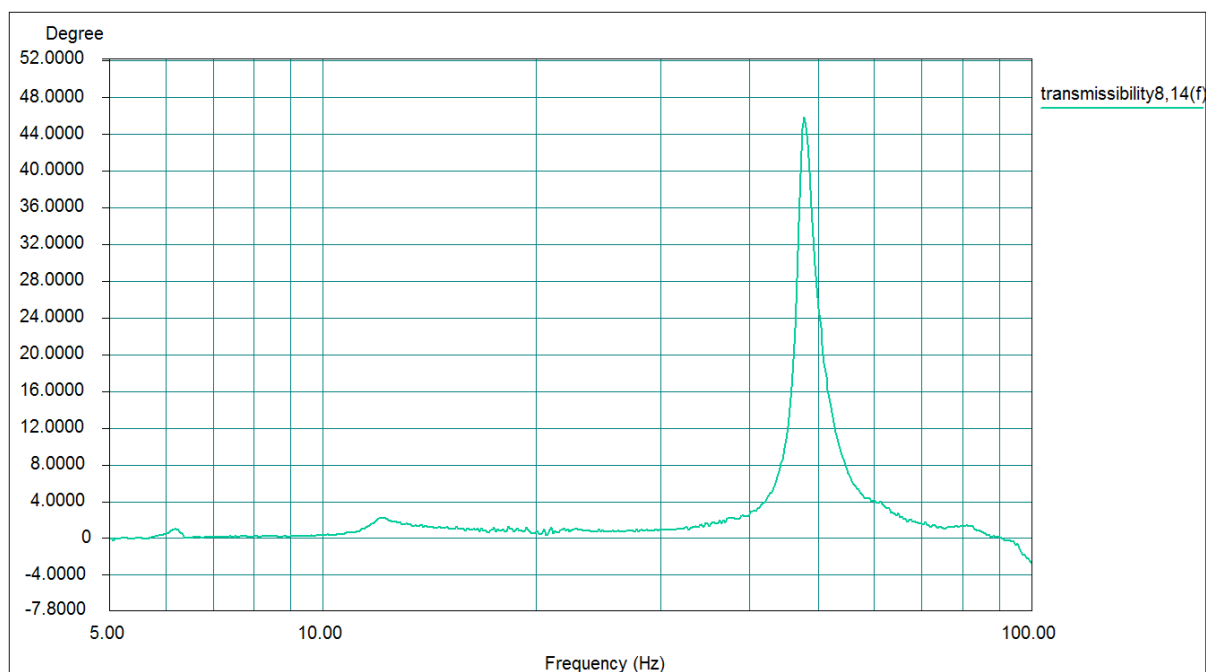


Figure 15
RSTD Search Log (Z direction), phase of transmissibility between CoG(8) and CTRL(14)

Level: 100 %
Frequency: 99.972771 Hz

Full Level Time: 00:04:20
Time Remaining: 00:00:00

Sweep Type: Logarithmic
Sweep Rate: 1 Oct/Min

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tana 0 EVO
1_ANSI_2mod_en

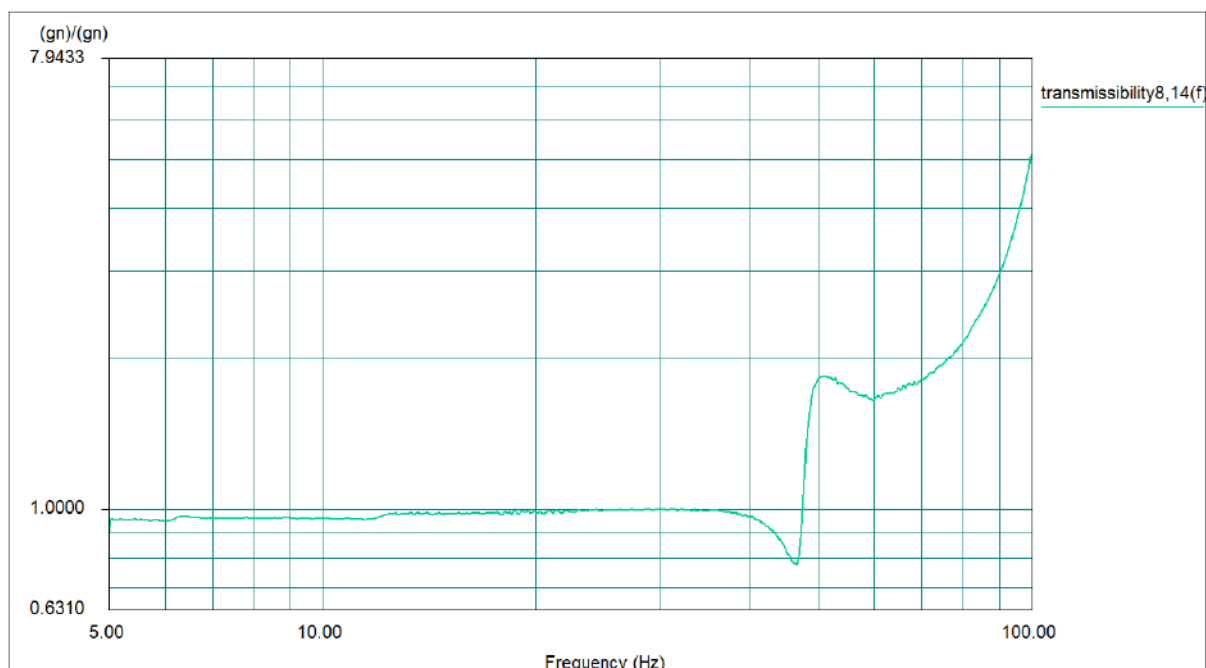


Figure 16

RSTD Search Log (Z direction), amplitude ratio of transmissibility between CoG(8) and CTRL(14)

Input Channel Parameters

Input	Type	Analysis	Max. Volts	mv/(EU)	Weighting	Coupling	Quantity	I.D.	Location
1	Response	Filter	1.0	9.8090mv/(gn)	1.0000	ICP	Acce.	088	Consloe
6	Response	Filter	1.0	9.7000mv/(gn)	1.0000	ICP	Acce.	010x	
7	Response	Filter	1.0	10.0200mv/(gn)	1.0000	ICP	Acce.	010y	CoG
8	Response	Filter	1.0	9.6700mv/(gn)	1.0000	ICP	Acce.	010z	
10	Response	Filter	1.0	9.8900mv/(gn)	1.0000	ICP	Acce.	012x	
11	Response	Filter	1.0	9.9600mv/(gn)	1.0000	ICP	Acce.	012y	Tip
12	Response	Filter	1.0	9.7300mv/(gn)	1.0000	ICP	Acce.	012z	
14	Control	Filter	1.0	93.9700mv/(gn)	1.0000	ICP	Acce.	086	Table

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tana 0 EVO
1_ANSI_2mod_en

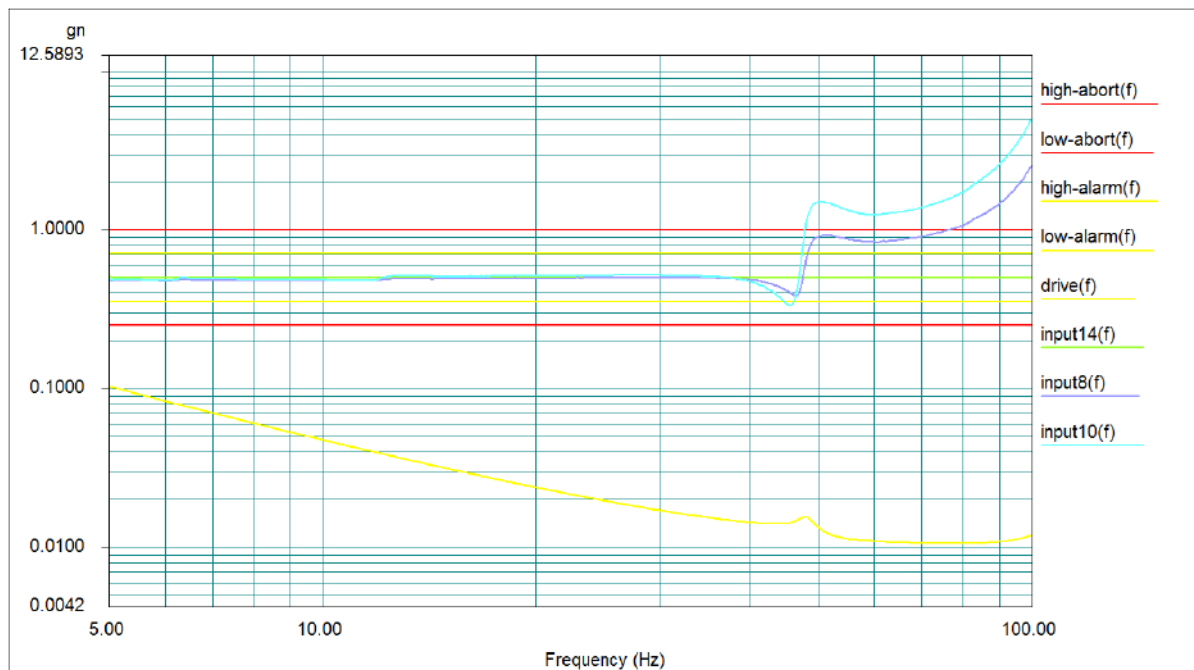


Figure 17
RSTD Search Log (Z direction)

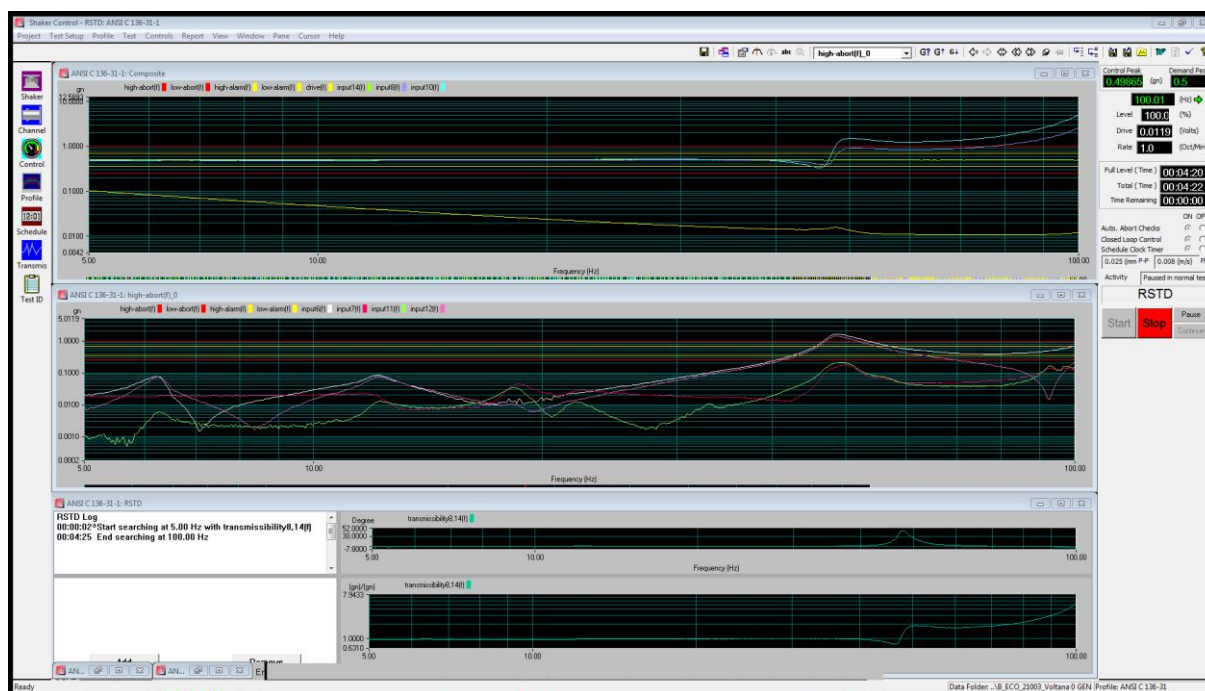


Figure 18
RSTD test control panel Z direction

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**B_ECO_VJK_21003_Vol
tana 0 EVO
1 ANSI 2mod en**

Res#	Freq.(Hz)	Trans.	Phase	Q	Dwell	Elapsed
1	100.00	5.13	-2.79	15.9	Done	00:16:39

Time	Event
00:00:02	Start searching at 5.00 Hz with transmissibility _{8,14(f)}
00:04:25	End searching at 100.00 Hz
00:12:40	Add resonance at 100.00 Hz
00:13:27	Start dwell at 100.00 Hz
00:30:09	End dwell at 100.00 Hz

Dactron Dual DSP Shaker Control System				
Swept Sine Test Run Log				
13:13:35, Tuesday, January 19, 2021				
ENTRY TIME	FREQ(Hz)	CTL/DEMAND(Peak)	SOURCE	DESCRIPTION
13:13:35, Jan 19, 21	0.00		User Command	Start the Test
13:13:37, Jan 19, 21	5.00		Controller	Start a new sweep/dwell entry
13:18:00, Jan 19, 21	100.01	0.499/ 0.500 gn	Controller	Paused in scheduled test
13:18:00, Jan 19, 21	100.01		Controller	'control(f),drive(f),Hinv(f),profile(f),high-abort(f),low-abort(f),high-alarm(f),low-alarm(f),controlUp(f),controlDown(f),shaker_acc(f),shaker_vel(f),shaker_disp(f),control(t),frequency(t),input6(t),input_hist6(t),input7(t),input_hist7(t),input8(t),input_hist8(t),input6(f),input6Up(f),input6Down(f),input7(f),input7Up(f),input7Down(f),input8(f),input8Up(f),input8Down(f),input1(t),input_hist1(t),input10(t),input_hist10(t),input11(t),input_hist11(t),input12(

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B_ECO_NY_08_02_2k_5mod

29. oldal (33)



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**B_ECO_VJK_21003_Vol
tana 0 EVO
1_ANSI_2mod_en**

				t),input_hist12(t),input14(t),input_hist14(t),input1(f),input1Up(f),input1Down(f),input10(f),input10Up(f),input10Down(f),input11(f),input11Up(f),input11Down(f),input12(f),input12Up(f),input12Down(f),input14(f),input14Up(f),input14Down(f),transmissibility8,14(f),coherence8,14(f),' Saved Signals
13:27:03, Jan 19, 21	100.01		User Command	Resume(Continue) the Drive output
13:27:03, Jan 19, 21	100.00		Controller	Start a new sweep/dwell entry
13:28:16, Jan 19, 21	100.00		User Command	Set Level to 101%
13:28:21, Jan 19, 21	100.00		User Command	Set Level to 104%
13:43:45, Jan 19, 21	100.00		Controller	All Panes saved to the disk.
13:43:46, Jan 19, 21	100.00		Controller	'control(f),drive(f),Hinv(f),profile(f),high-abort(f),low-abort(f),high-alarm(f),low-alarm(f),controlUp(f),controlDown(f),shaker_acc(f),shaker_vel(f),shaker_disp(f),control(t),frequency(t),input6(t),input_hist6(t),input7(t),input_hist7(t),input8(t),input_hist8(t),input6(f),input6Up(f),input6Down(f),input7(f),input7Up(f),input7Down(f),input8(f),input8Up(f),input8Down(f),input1(t),input_hist1(t),input10(t),input_hist10(t),input11(t),input_hist11(t),input12(t),input_hist12(t),input14(t),input_hist14(t),input1(f),input1Up(f),input1Down(f),input10(f),input10Up(f),input10Down(f),input11(f),input11Up(f),input11Down(f),input12(f),input12Up(f)

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				f),input12Down(f),input14(f),input14Up(f),input14Down(f),transmissibility8,14(f),coherence8,14(f),' Saved Signals
13:43:46, Jan 19, 21	0.00	0.525/ 0.525 gn	Controller	End of Test
13:43:46, Jan 19, 21	0.00			Full level elapsed 00:05:31
13:43:46, Jan 19, 21	0.00			Full level elapsed sine cycles: 108234.7

4.6. Visual examination

The customer requested an additional type of validation for the fixation. The fixing elements, e.g. Nut, washer, bolt must be marked together and must not turn relatively to each other or to a fix point outside their system. This applies to a turning torque of 80% of the original fixing torque after the test, too. If any of the mentioned system's parts turns when applying the $0.8 \times M_{\text{original}}$ torque, the fixation is considered failed.



Figure 19
Marked parts after the test

There was no noticeable turning of the parts or the whole system, therefore, the fixation passed.

5. Evaluation of results

The “Voltana EVO 1” luminaire was able to withstand the vibration test. Further evaluation shall be performed by the customer.

6. Conclusion

Control of frequencies – After sine sweep				
Performed	Yes	X	No	
Significant changes in frequency	Yes		No	X
Note	The severity of frequency changes do not imply significant structural damages			

Fixing Part Tightening Evaluation				
Performed	Yes	X	No	
Satisfied	Yes	X	No	
Note				

Modified ANSI C 136-31 Vibration test evaluation				
Performed	Yes	X	No	
Satisfied	Yes	X	No	
Note				

--- END ---