TEST REPORT

CTK Co., Ltd.
5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si,
Gyeonggi-do, Republic of Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

REPORT No.: CTK-2024-01654

1.	**Applicant**	
	◦ Name :	Hanwha Vision Co., Ltd
	◦ Address :	6 Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, 13488 KOREA
	◦ Date of Receipt :	05 07, 2024
2.	**Manufacturer**	
	◦ Name :	Hanwha Vision Co., Ltd
3.	**Use of Report :**	Quality control
4.	**Test sample / Model :**	NETWORK CAMERA / PNM-C32083RQZ PoE Injector / PT-PSE109GBRO-AH-S
5.	**Date(s) of test :**	05 14, 2024 ~ 05 30, 2024
6.	**Test Standard (Method) used :**	Specifications presented by the sponsor (reference NEMA TS 2.2.7 ~ 9)
7.	**Testing Environment :**	Temperature: (25 ±10) ℃, Humidity: (50 ±25) % R.H. Pressure: (96 ±10) kPa
8.	**Test Results :**	Clause 4. Refer to the test results
9.	**Location of Test :**	☒ Permanent Testing Lab ☐ On Site Testing (5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Republic of Korea,)

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
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Approval	Tested by	Technical Manager
	Name: Min-Gi Moon (Signature)	Name: HoHyun Lee (Signature)

Remark. This report is not related to KOLAS accreditation and relevant regulation.

06 11, 2024

CTK Co., Ltd.

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1. Testing Laboratory

1.1 Testing laboratory information

Lab. Name	CTK Co., Ltd.
Address	5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Republic of Korea
Tel.	+82-31-339-9970
Fax.	+82-31-624-9501
E-Mail	ctk@e-ctk.com
Website	e-ctk.com

1.2 Testing laboratory accreditation status

Country	Classification	Accreditation Number	Logo
International	KOLAS	TESTING NO. KT119	

2. Product description and Equipment information

2.1 Product description

Product Name	Model Name	Quantity	Comment
NETWORK CAMERA	PNM-C32083RQZ	1 EA	-
PoE Injector	PT-PSE109GBRO-AH-S	1 EA	

Manufacturer's name

Name and address of factory (ies)	1) HANWHA VISION VIETNAM COMPANY LIMITED Lot O-2, Que Vo Industrial Zone extended area, Nam Son ward, Bac Ninh city, Bac Ninh province, Vietnam 2) D-TECH CO.,LTD. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi-do, Korea (Suwon Industrial Complex)

Model description

Basic Model ..... :	PNM-C32083RQZ
Series model ..... :	PNM-C16083RQZ
Model differences ..... :	Use of the same external shape and materials (case, finishing material, PCB, cable, etc.), differences in SW.

2.2 Equipment information

Testing equipment	Model Name	Manufacturer	Manufacturing Number	Calibration Date
Temperature & Humidity Chamber	C4-340	Weisstechnik	54260023190010	2025-04-05
VIBRATION TESTING SYSTEM	GT1000M	FAMTECH	D1803072	N/A
VIBRATION TESTING SYSTEM	GT1000M	FAMTECH	D1803072-1	N/A
Acceleration sensor	8703A250M5	KISTLER	5830236	2025-03-22
Acceleration sensor	8703A250M5	KISTLER	5722241	2024-08-17

2.3 Pre-test product images

[PNM-C32083RQZ]

Top

Bottom

Front

Back

Left side

Right side

[PT-PSE109GBRO-AH-S]

Top

Bottom

Front

Back

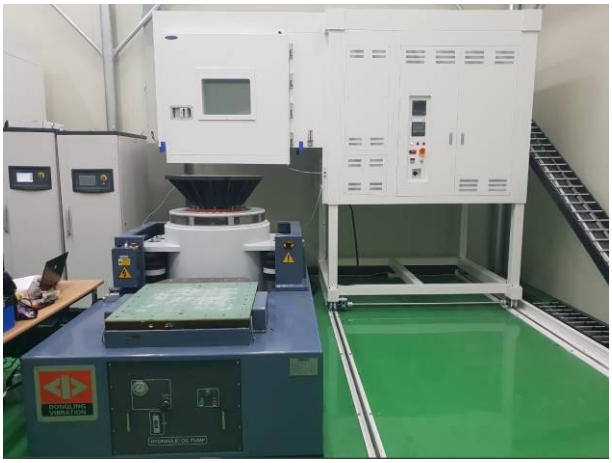
Left side

Right side

2.4 Testing equipment images

C4-340

GT1000M



GT1000M

8703A250M5

8703A250M5

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3. Test conditions and methods

3.1 Test duration, Environmental conditions, and Location

3.1.1 Test Date : 05 14, 2024 ~ 05 30, 2024

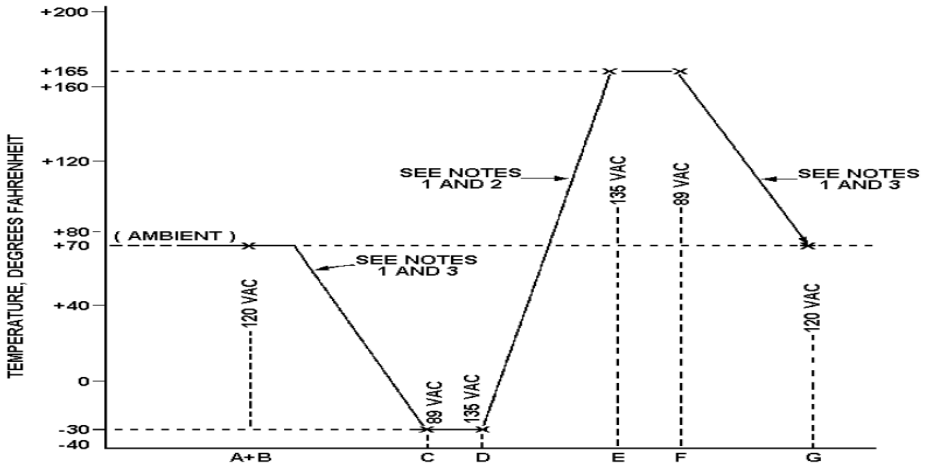
3.1.2 Measured Environmental Conditions

Item	Temperature (℃)	Humidity (% R.H.)	Pressure (kPa)
Measurement	24.3	31.4	91.2

3.2 Test conditions

3.2.1 Transient Tests(Power Service)[NEMA TS 2-2013 2.2.7.2 Test B – 13. C]

- Sample state : Operating state
- Application step : Step E – Step F
- Applied voltage : Step E – Step F(135 Vac ~ 89 Vac)
- Temperature / Humidity : 74 ℃ = 165 °F
- Test Time(h) : 15
- Evaluations Criteria :
  - Check for mechanical damage before and after testing
- Test methods
  - The sample is placed in the chamber.
  - NEMA TS 2-2013 [2.2.7.2 Test B: Transient Tests(Power Service)-13. C.] Apply power in step of application.
  - Perform the temperature/humidity test according to NEMA TS 2-2013 [2.2.7.2 Test B: Transient Tests (Power Service)-13. C.].



[NEMA TS 2-2013[2.2.7.2 Test B : Transient Tests(Power Service) 13. C.] Test profile]

3.2.2 Resonant search [NEMA TS 2-2013 2.2.8.3]

- Sample status : unpackaged / not in operation
- Applied waveform : Sine
- Frequency(Hz) : 5 ~ 30
- Double amplitude displacement (inch) : 0.015
- Sweep rate(Sweep/min) : 12.5
- Applicable axis : X, Y, Z
- Test time(h) : 12.5
- Evaluation items
  - Check for mechanical damage before and after testing
- Test methods
  - With the test unit securely fastened to the test table, set the test table for a double amplitude displacement of 0.015 inch.
  - Cycle the test table over a search range from 5 to 30 Hz and back within a period of 12.5 minutes.
  - Conduct the resonant frequency search in each of the three mutually perpendicular planes.
  - Note and record the resonant frequency determined from each plane.
    - In the event of more than on resonant frequency in a given plane, record the most severe a. resonance.
    - b. If resonant frequencies appear equally severe, record each resonant frequency.
    - c. If no resonant frequency occurs for a given plane within the prescribed range, 30 Hz shall be recorded.

3.2.3 Endurance Test[NEMA TS 2-2013 2.2.8.4]

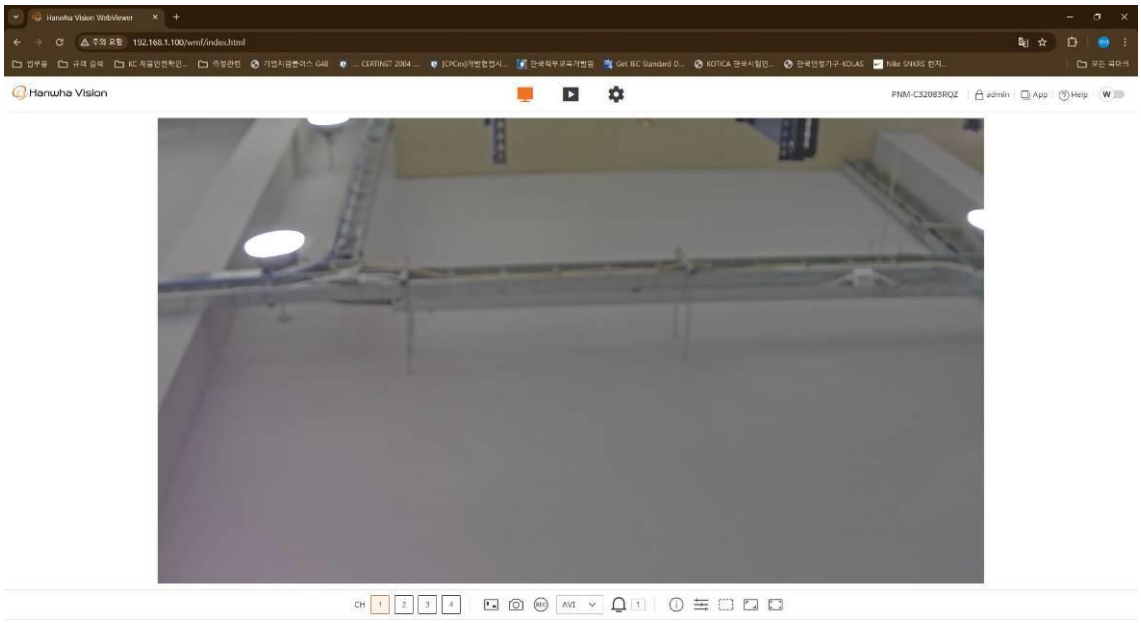
- Sample status : unpackaged / not in operation
- Applied waveform : Sine
- Frequency(Hz) : 30 or 3.2.2 Test results
- Acceleration(G) : 0.5
- Applicable axis : X, Y, Z
- Test time(h) : All 3(Each axis 1)
- Evaluation items
  - Check for mechanical damage before and after testing
- Test methods
  - Vibrate the test unit in each plane at its resonant frequency for a period of 1 hour at an amplitude resulting in 0.5 g acceleration. (test profile)
  - When more than one resonant frequency has been recorded in accordance with Section 1.2 Item 4, the test period of 1 hour shall be divided equally between the resonant frequencies.
  - The total time of the endurance test shall be limited to 3 hours, 1 hour in each of three mutually perpendicular planes.

3.2.4 Shock(impact) Test[Refer to NEMA TS 2-2013 2.2.9]

- Sample status : unpackaged / not in operation
- Applied waveform : Half sine
- Acceleration(G) : 10
- Nominal duration (ms) : 11
- Applicable axis : X, Y, Z
- Number of impacts : 1 per direction (total 6)
- Evaluation items
  - ■ Check for mechanical damage before and after testing

3.3 Testing Image

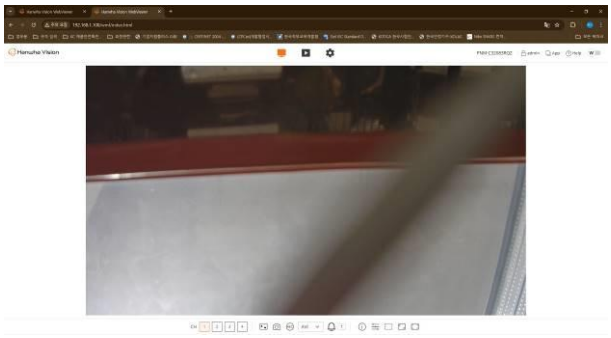
3.3.1 Verification of Normal Operation before testing



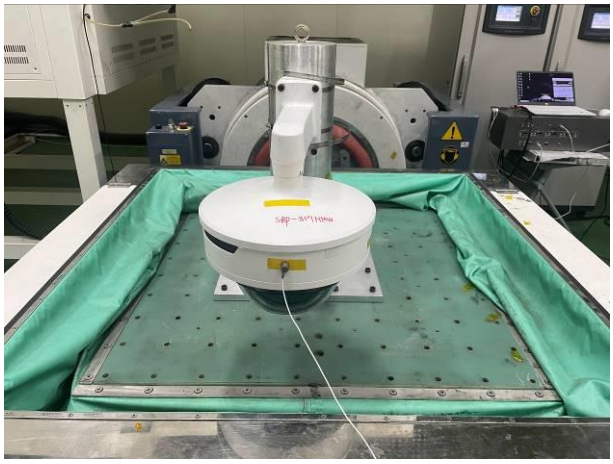
Verification of operation before testing

3.3.2 Test Environment Set-up Images

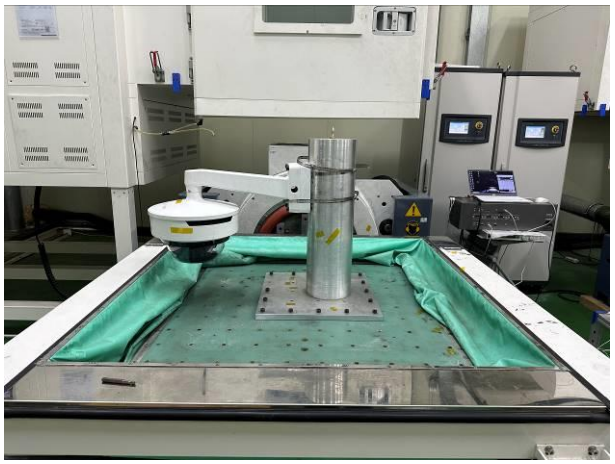
Transient Tests



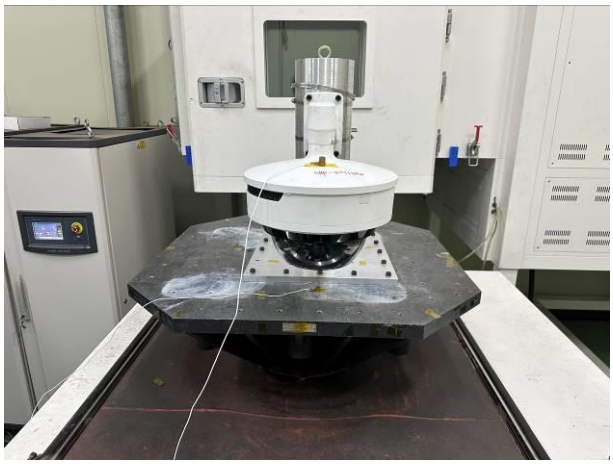
Transient Tests -
Verification of operation during testing



Resonant search - X axis,
Endurance, Test Shock(impact) Test Same configuration



Resonant search - Y axis,
Endurance, Test Shock(impact) Test Same configuration



Resonant search - Z axis,
Endurance, Test Shock(impact) Test Same configuration

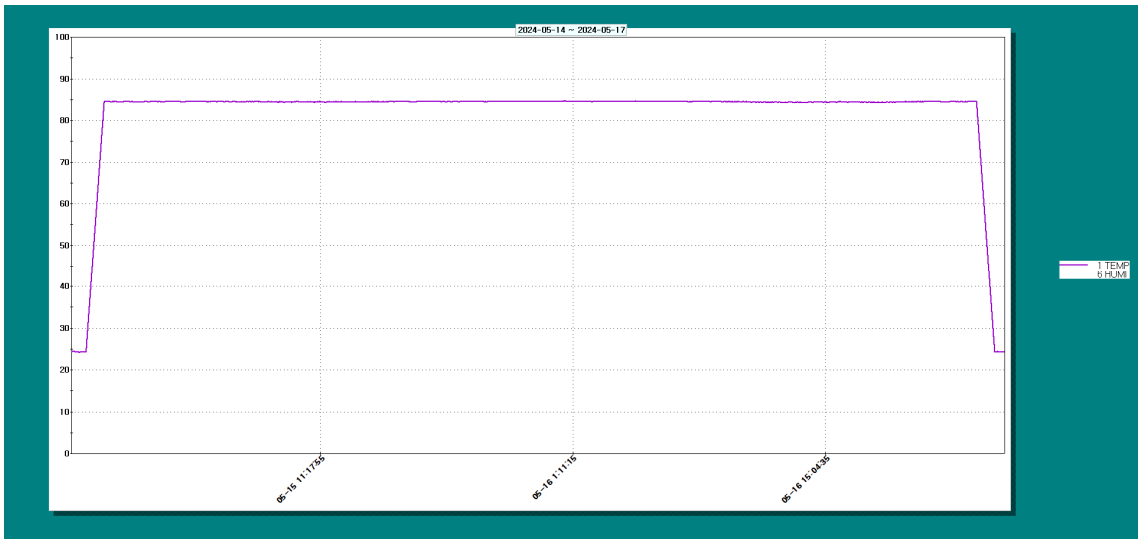
4. Test result

4.1 Test Result Table

<table>
<tr><th colspan="2">Evaluation Criteria</th><th colspan="3">Test Results</th><th>Comment</th></tr>
<tr><td rowspan="2">Transient Tests</td><td>Before</td><td colspan="3">Pass</td><td></td></tr>
<tr><td>After</td><td colspan="3">Pass</td><td></td></tr>
<tr><td colspan="2" rowspan="4">Resonant search</td><td>Axis</td><td>Resonance check</td><td>Recorded</td><td rowspan="4"></td></tr>
<tr><td>X</td><td>None</td><td>30 Hz</td></tr>
<tr><td>Y</td><td>2 Point</td><td>5.004 / 5.29 Hz</td></tr>
<tr><td>Z</td><td>10 Point</td><td>17.38 / 18.84 / 21.30 / 23.49 / 23.93 / 24.04 / 24.09 / 24.43 / 24.50 / 24.63</td></tr>
<tr><td rowspan="2">Endurance Test</td><td>Before</td><td colspan="3">Pass</td><td></td></tr>
<tr><td>After</td><td colspan="3">Pass</td><td></td></tr>
<tr><td rowspan="2">Shock(impact) Test</td><td>Before</td><td colspan="3">Pass</td><td></td></tr>
<tr><td>After</td><td colspan="3">Pass</td><td></td></tr>
</table>

4.2 Data

[Transient Tests(Power Service)[NEMA TS 2-2013 2.2.7.2 Test B – 13. C]]



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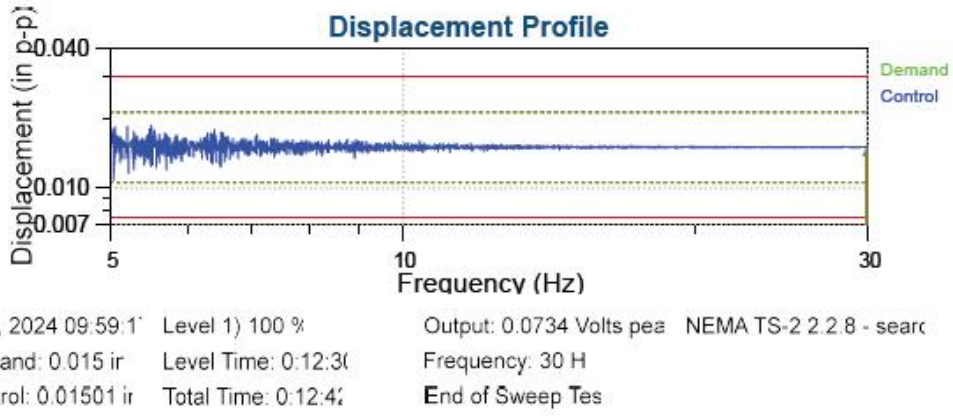
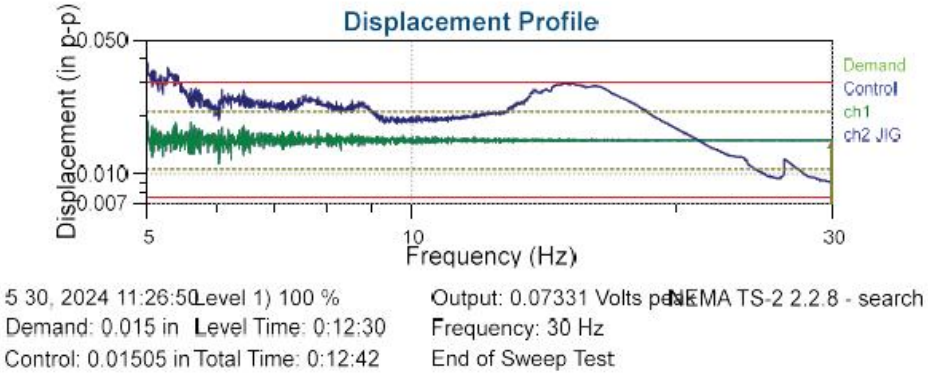
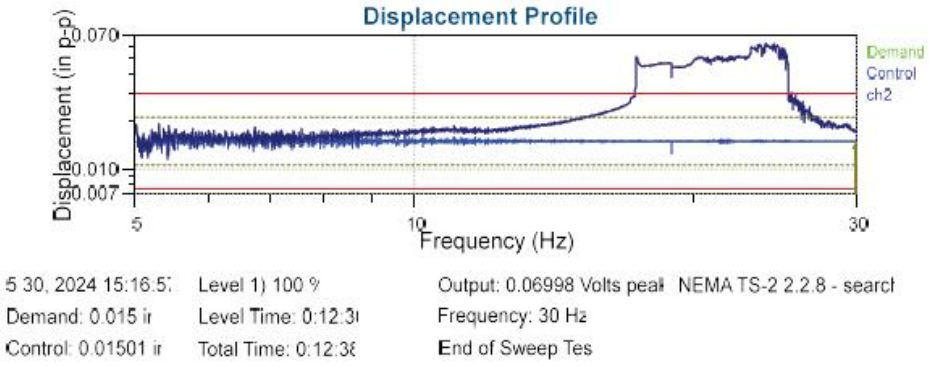
[Resonant search [NEMA TS 2-2013 2.2.8.3]



X axis

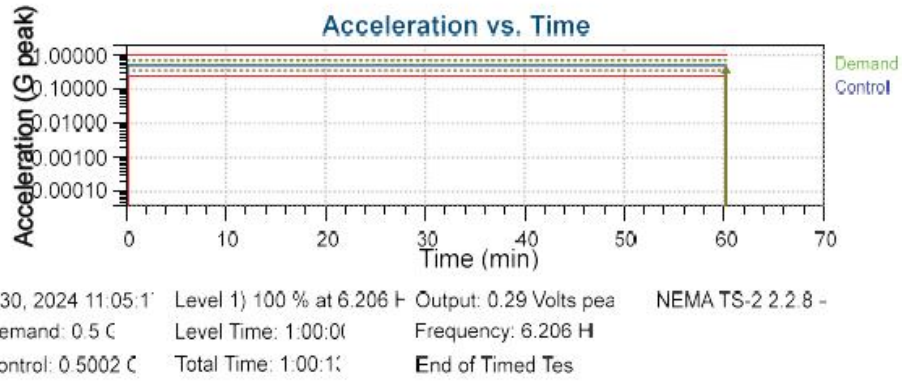


Y axis

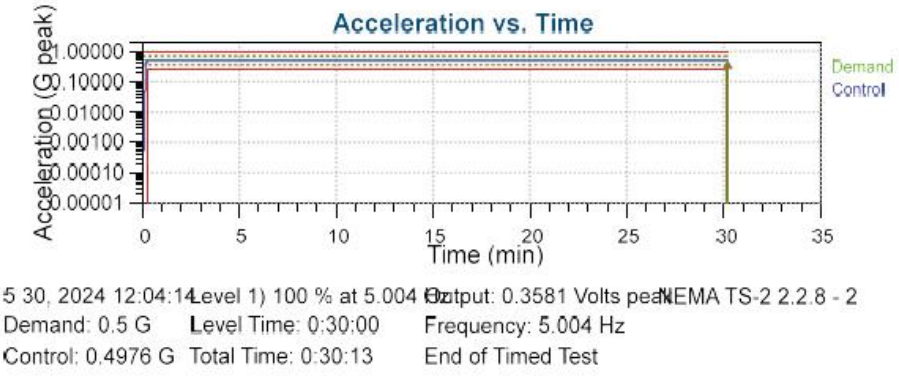


Z axis

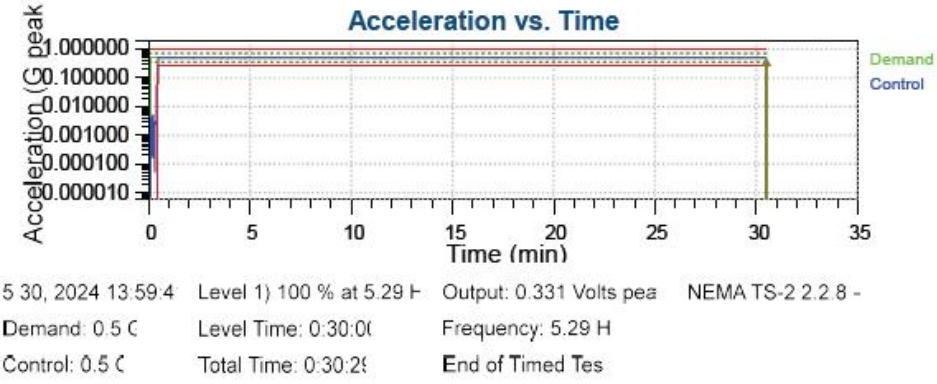
[Endurance Test[NEMA TS 2-2013 2.2.8.4]



X axis

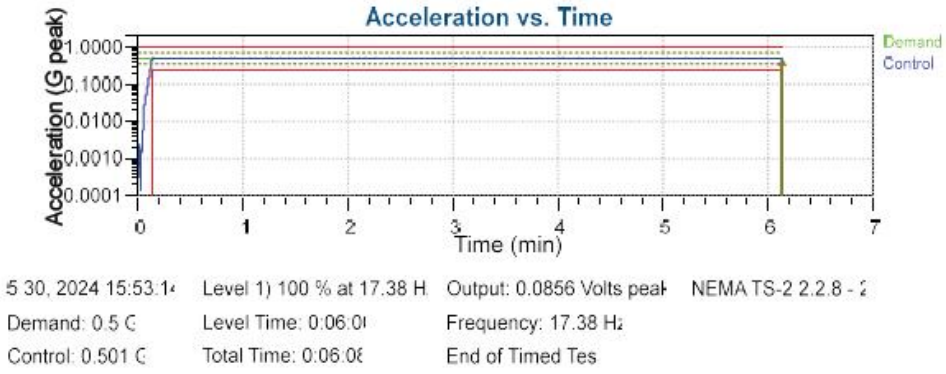


Y axis – 5.004 Hz

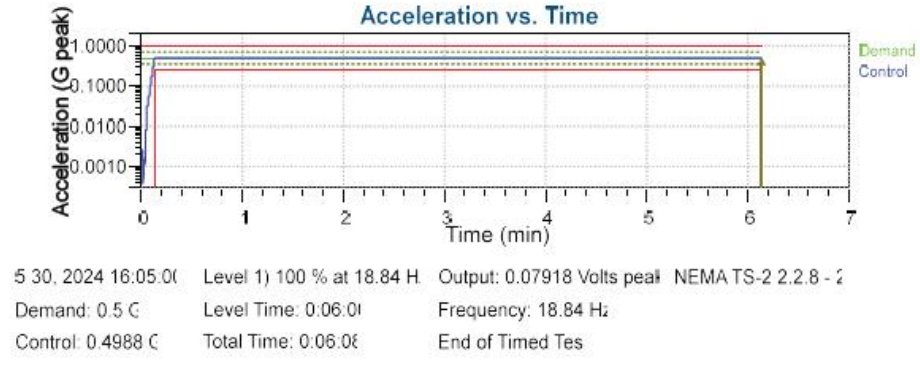


Y axis – 5.29 Hz

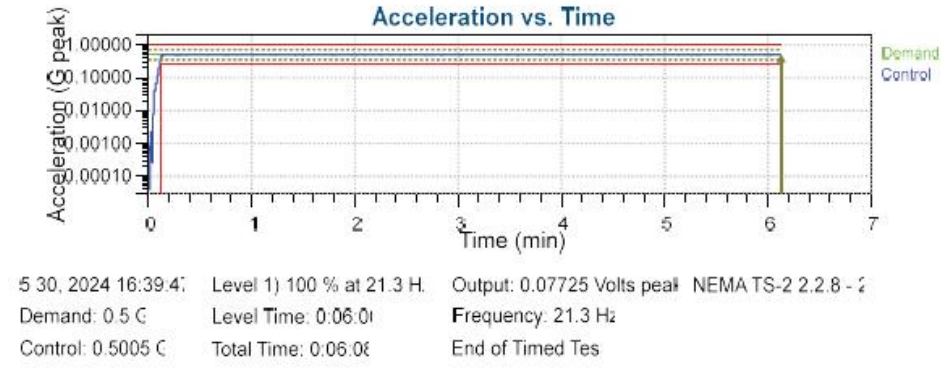
[Endurance Test[NEMA TS 2-2013 2.2.8.4]



Z axis – 17.38 Hz

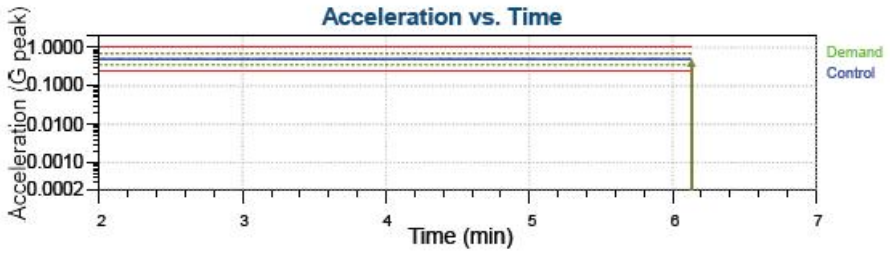


Z axis – 18.84 Hz



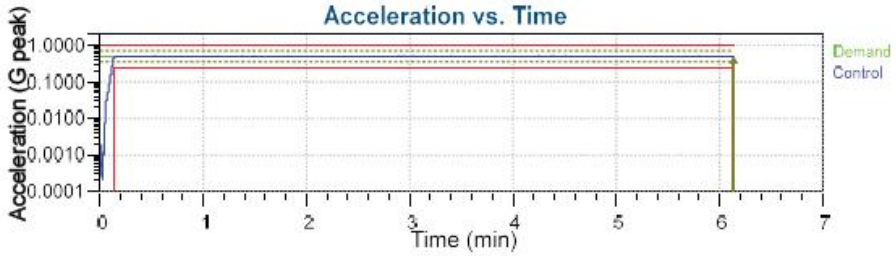
Z axis – 21.30 Hz

[Endurance Test[NEMA TS 2-2013 2.2.8.4]



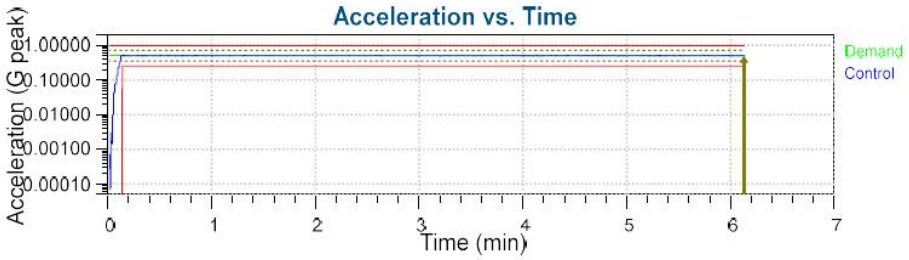
5 30, 2024 16:30:5 Level 1) 100 % at 23.49 H Output: 0.07001 Volts peal NEMA TS-2 2.2.8 - 2
Demand: 0.5 G Level Time: 0:06:0 Frequency: 23.49 Hz
Control: 0.4892 G Total Time: 0:06:0 End of Timed Tes

Z axis – 23.49 Hz



5 30, 2024 16:16:0 Level 1) 100 % at 23.93 H Output: 0.08574 Volts peal NEMA TS-2 2.2.8 - 2
Demand: 0.5 G Level Time: 0:06:0 Frequency: 23.93 Hz
Control: 0.4985 G Total Time: 0:06:0 End of Timed Tes

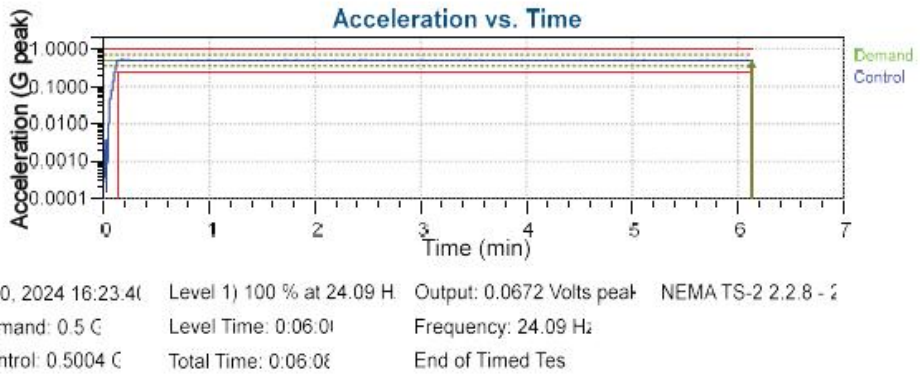
Z axis – 23.93 Hz



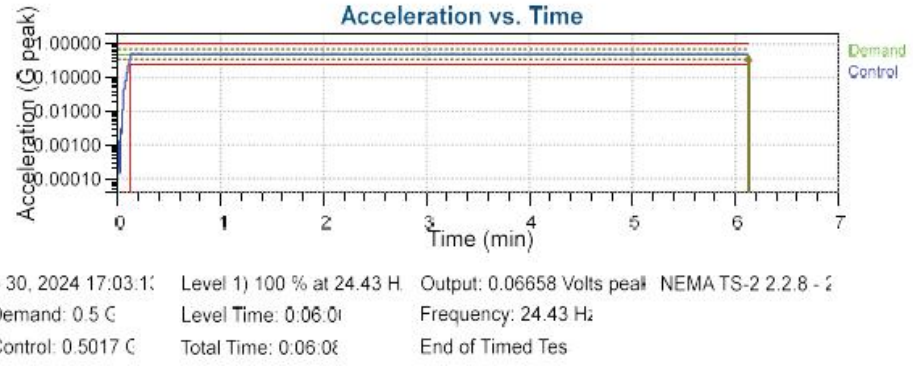
5 30, 2024 16:47:2 Level 1) 100 % at 24.04 H Output: 0.0672 Volts peal NEMA TS-2 2.2.8 - 2
Demand: 0.5 G Level Time: 0:06:0 Frequency: 24.04 Hz
Control: 0.5037 G Total Time: 0:06:0 End of Timed Tes

Z axis – 24.04 Hz

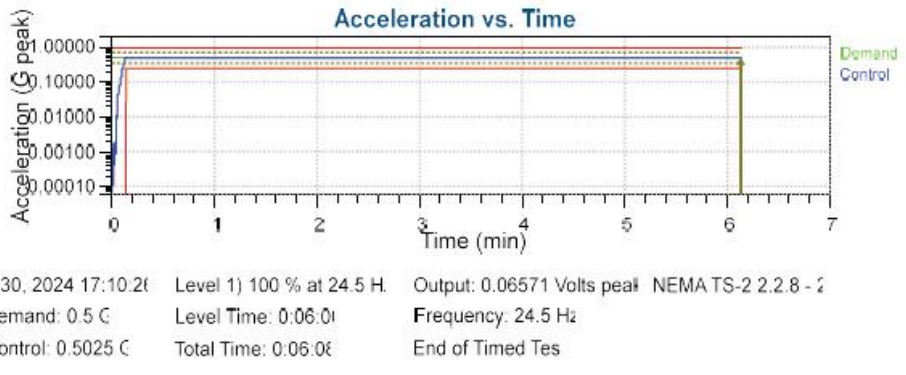
[Endurance Test[NEMA TS 2-2013 2.2.8.4]



Z axis – 24.09 Hz

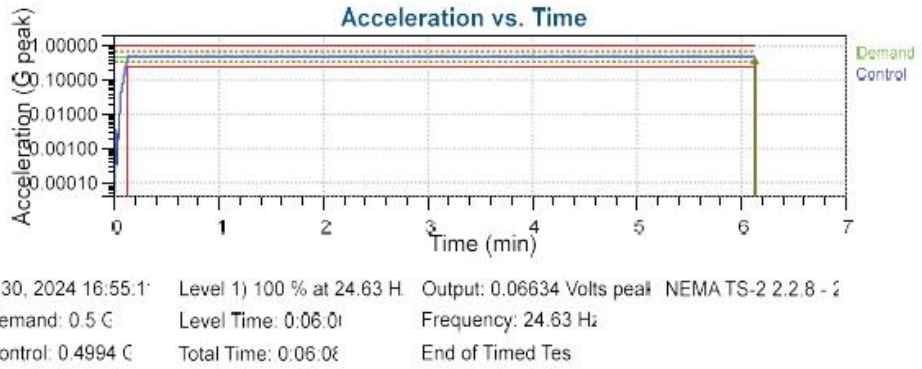


Z axis – 24.43 Hz



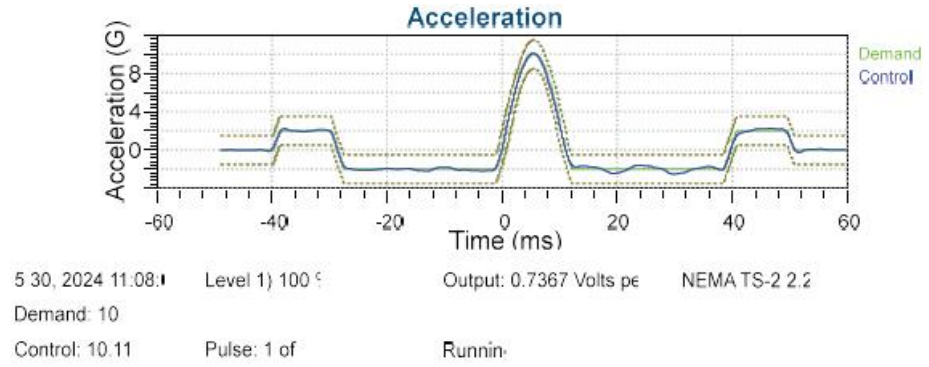
Z axis – 24.50 Hz

[Endurance Test[NEMA TS 2-2013 2.2.8.4]

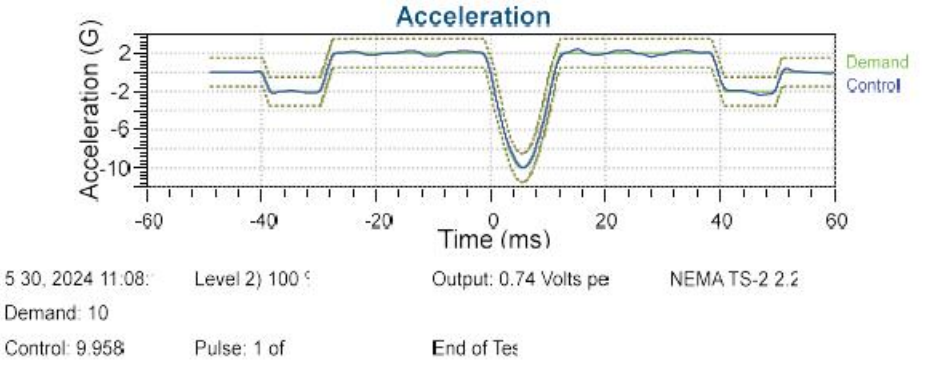


Z axis – 24.63 Hz

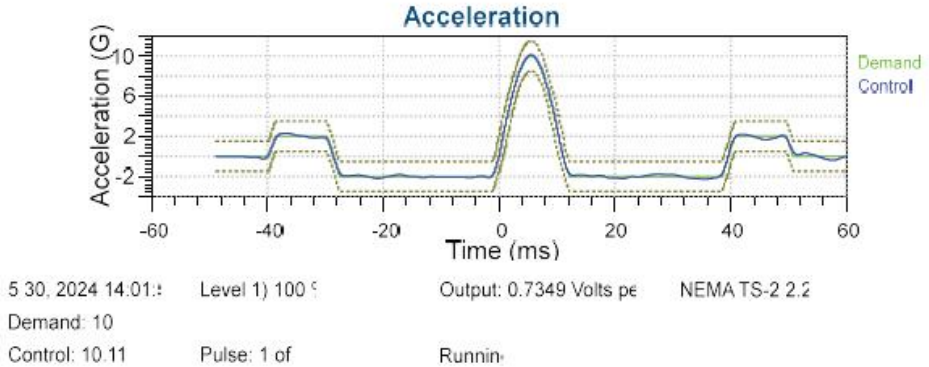
[Shock(impact) Test[Refer to NEMA TS 2-2013 2.2.9]



+X axis

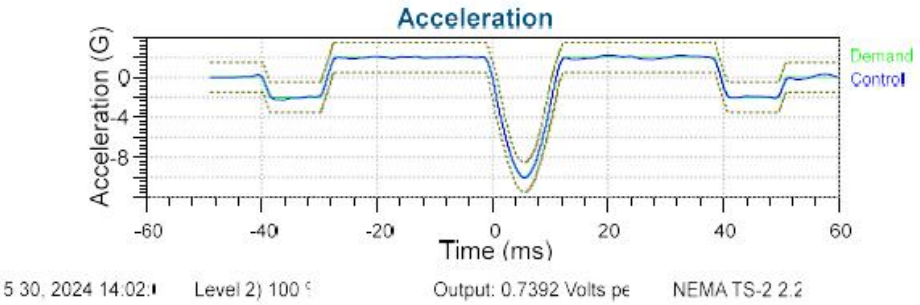


-X axis



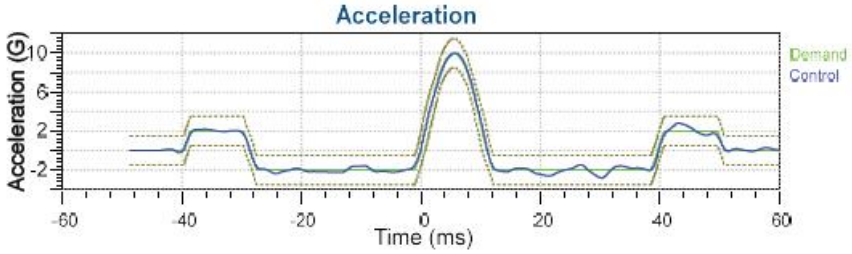
+Y axis

[Shock(impact) Test[Refer to NEMA TS 2-2013 2.2.9]



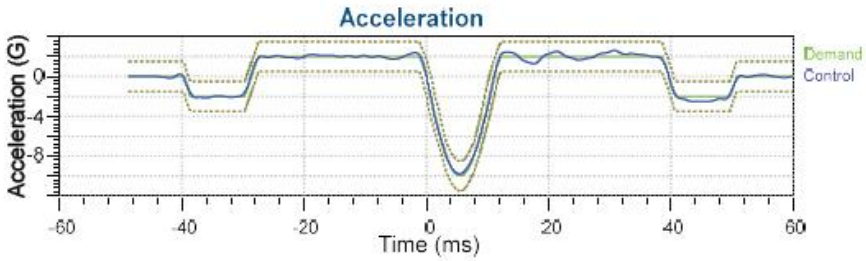
5 30, 2024 14:02:I Level 2) 100 ° Output: 0.7392 Volts pe NEMA TS-2 2.2
Demand: 10
Control: 10.07 Pulse: 1 of End of Tes

-Y axis



5 30, 2024 17:36:0° Level 1) 100 ° Output: 0.7389 Volts peak NEMA TS-2 2.2.°
Demand: 10 G
Control: 9.964 G Pulse: 1 of 1 Running

+Z axis

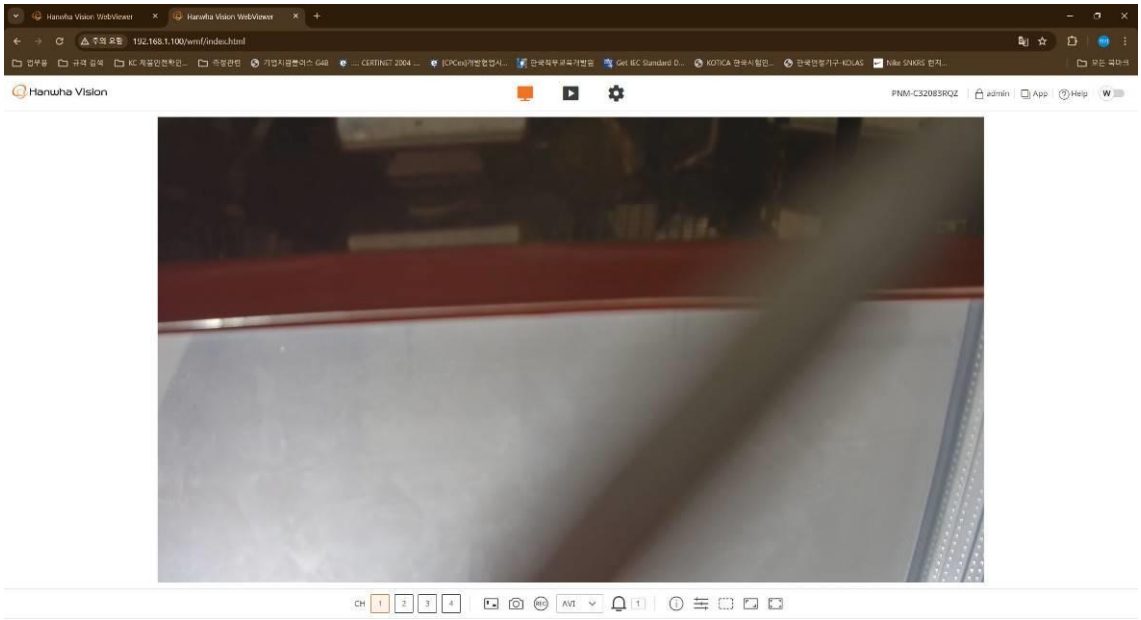


5 30, 2024 17:36:1° Level 2) 100 ° Output: 0.7435 Volts peak NEMA TS-2 2.2.°
Demand: 10 G
Control: 9.806 G Pulse: 1 of 1 End of Test

-Z axis

4.3 Post-Test Product Images

4.3.1 Verification of Normal Operation after testing



Verification of Normal Operation after testing

- End -