

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
Page (1) / (23) pages

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) °C, 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.

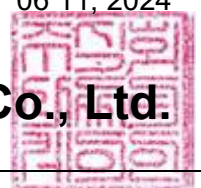


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1. Testing Laboratory

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	

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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)
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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

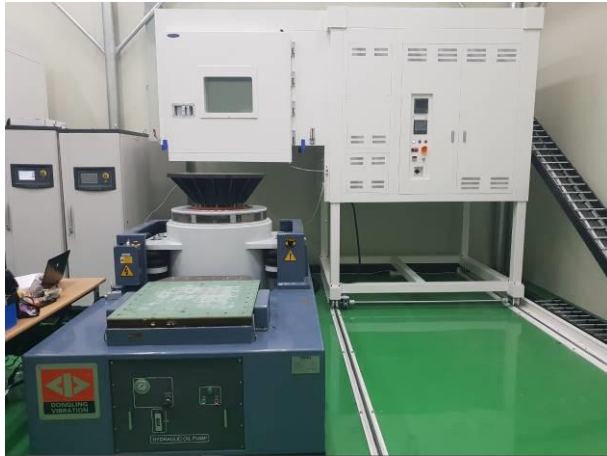
2.4 Testing equipment images



C4-340



GT1000M



GT1000M



8703A250M5



8703A250M5

3. Test conditions and methods

3.1 Test duration, Environmental conditions, and Location

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

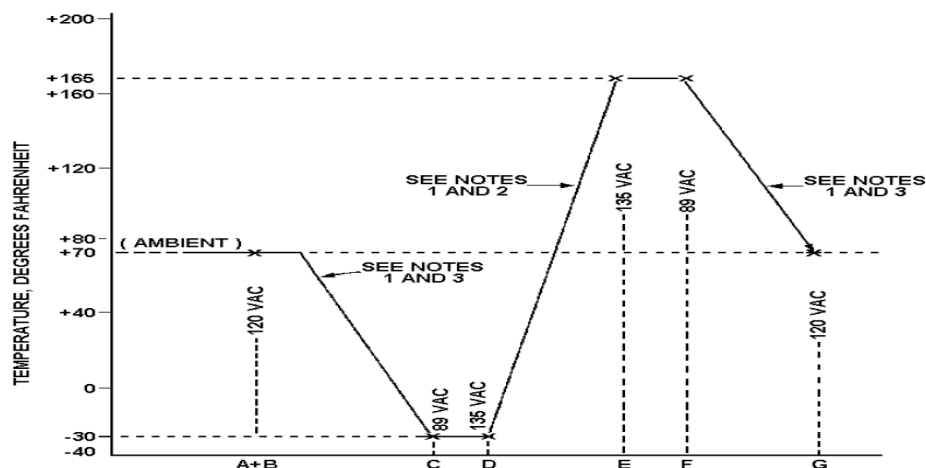
3.1.2 Measured Environmental Conditions

Item	Temperature (°C)	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 °C = 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 one 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.

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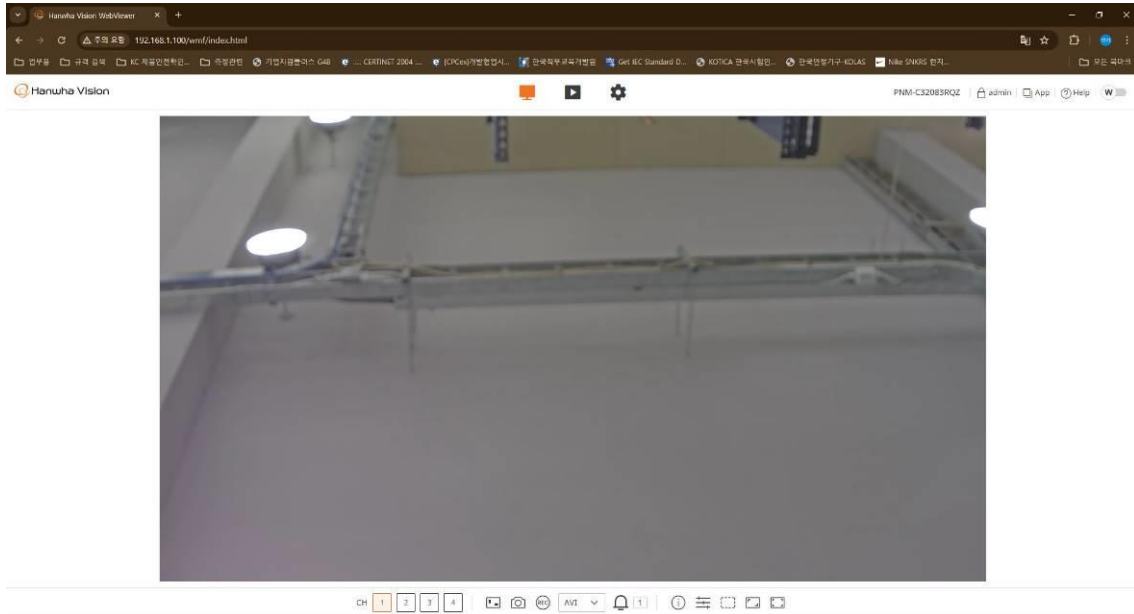
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3.2.4 Shock(impact) Test[Refer to NEMA TS 2-2013 2.2.9]

- 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

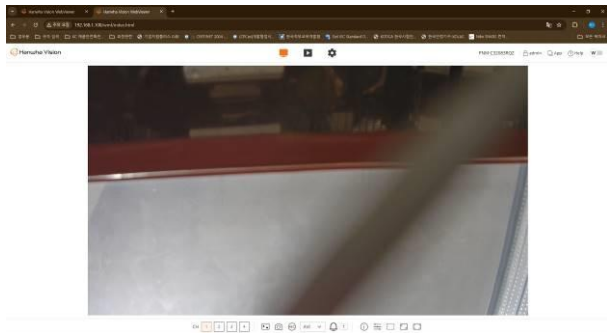


Verification of operation before testing

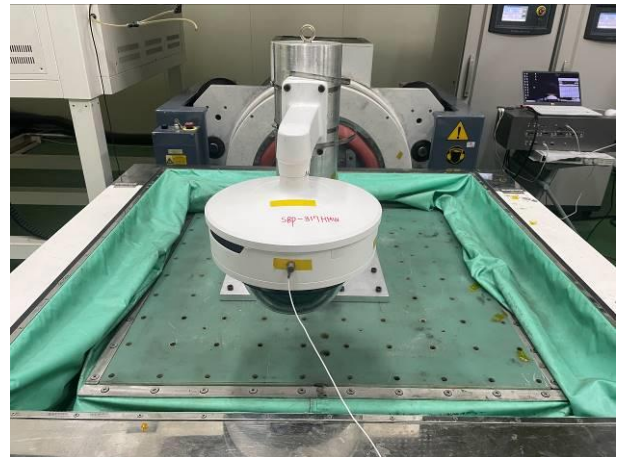
3.3.2 Test Environment Set-up Images



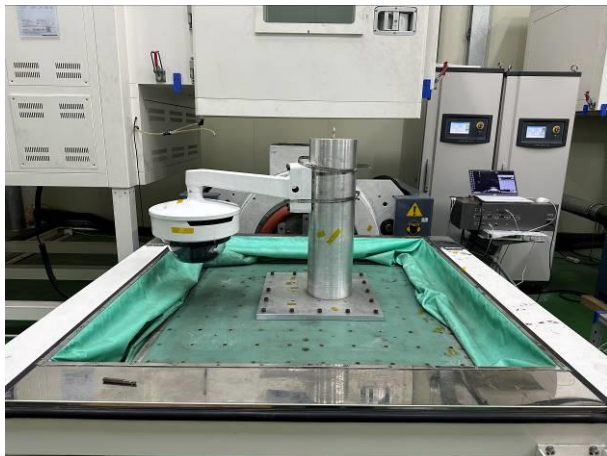
Transient Tests



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

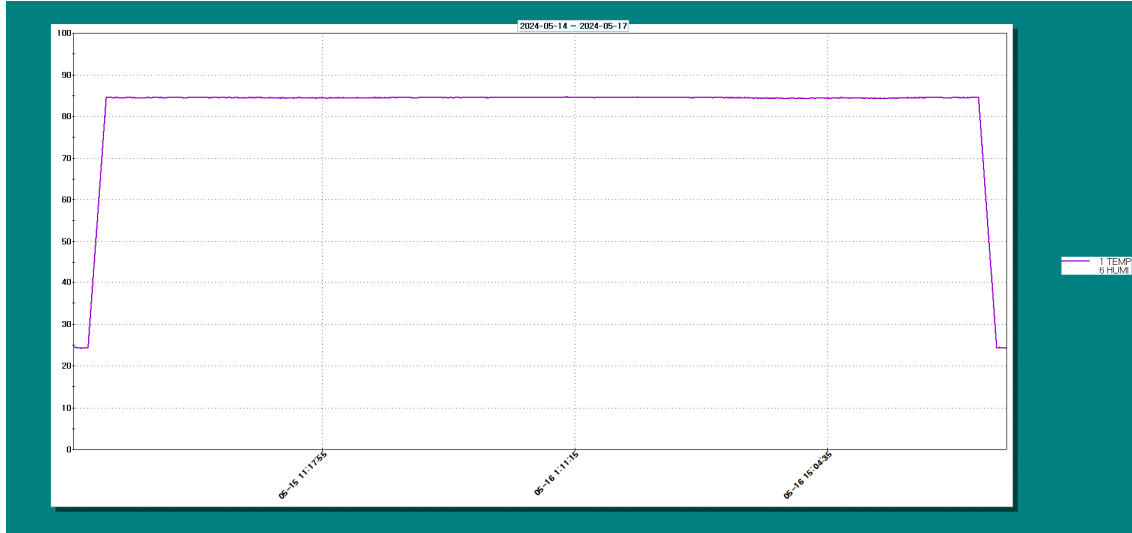
4. Test result

4.1 Test Result Table

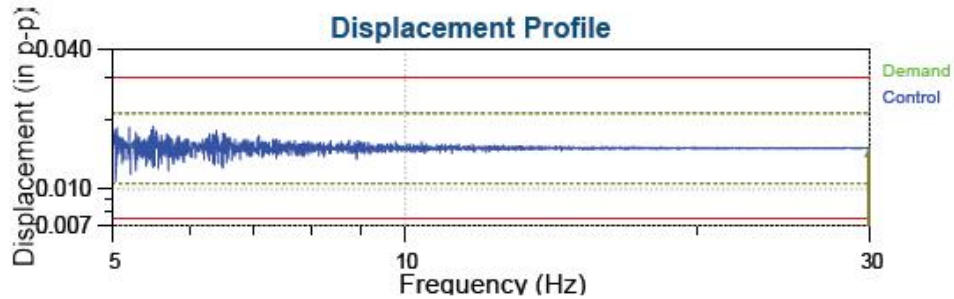
Evaluation Criteria		Test Results			Comment
Transient Tests	Before	Pass			
	After	Pass			
Resonant search		Axis	Resonance check	Recorded	
		X	None	30 Hz	
		Y	2 Point	5.004 / 5.29 Hz	
		Z	10 Point	17.38 / 18.84 / 21.30 / 23.49 / 23.93 / 24.04 / 24.09 / 24.43 / 24.50 / 24.63	
Endurance Test	Before	Pass			
	After	Pass			
Shock(impact) Test	Before	Pass			
	After	Pass			

4.2 Data

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

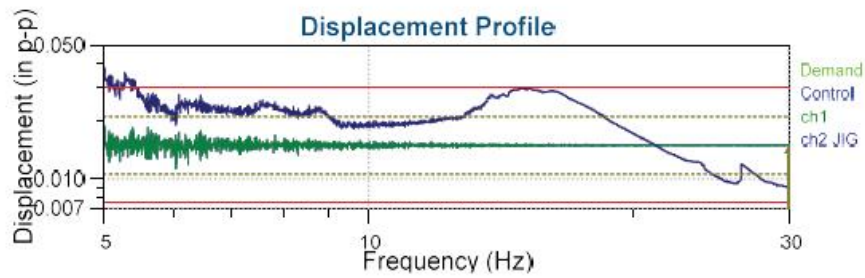


[Resonant search [NEMA TS 2-2013 2.2.8.3]



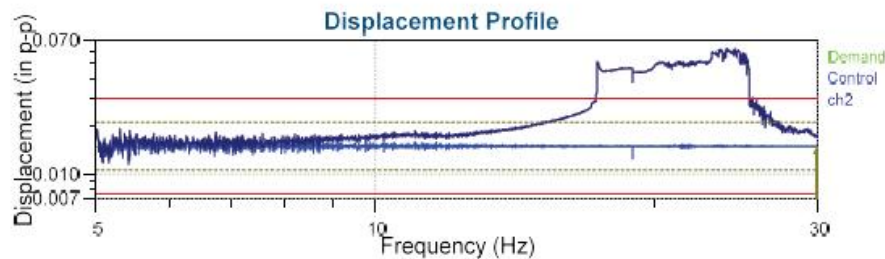
5/30, 2024 09:59:11 Level 1) 100 % Output: 0.0734 Volts peak NEMA TS-2 2.2.8 - search
Demand: 0.015 in Level Time: 0:12:30 Frequency: 30 Hz
Control: 0.01501 in Total Time: 0:12:41 End of Sweep Test

X axis



5/30, 2024 11:26:50 Level 1) 100 % Output: 0.07331 Volts peak NEMA TS-2 2.2.8 - search
Demand: 0.015 in Level Time: 0:12:30 Frequency: 30 Hz
Control: 0.01505 in Total Time: 0:12:42 End of Sweep Test

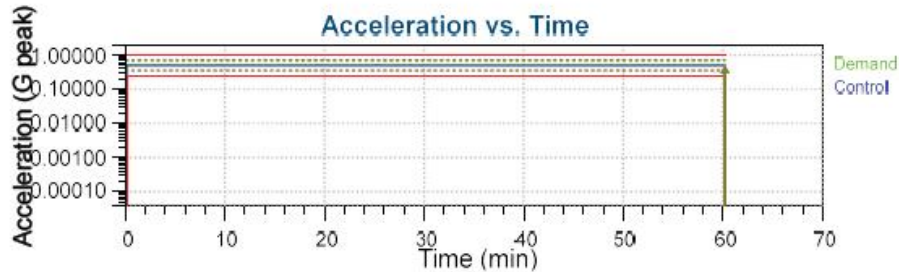
Y axis



5/30, 2024 15:16:51 Level 1) 100 % Output: 0.06998 Volts peak NEMA TS-2 2.2.8 - search
Demand: 0.015 in Level Time: 0:12:30 Frequency: 30 Hz
Control: 0.01501 in Total Time: 0:12:36 End of Sweep Test

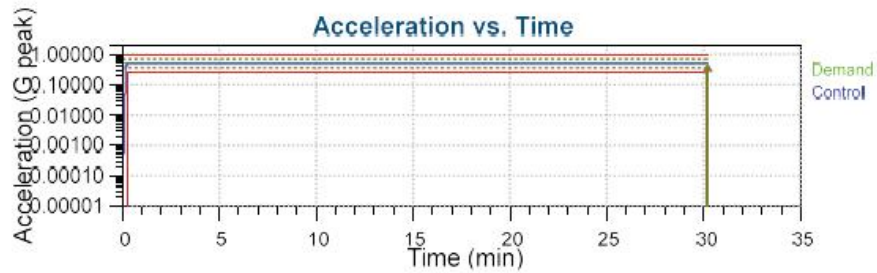
Z axis

[Endurance Test[NEMA TS 2-2013 2.2.8.4]



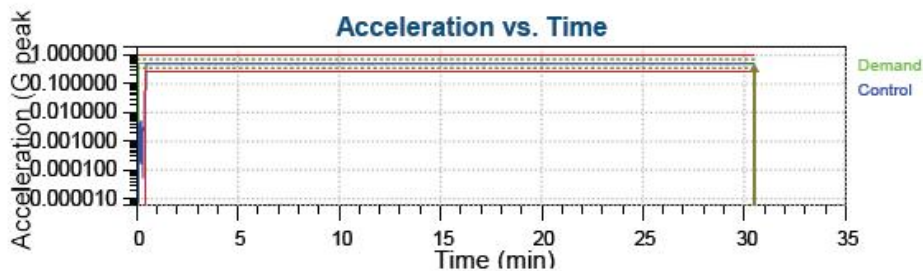
5/30, 2024 11:05:11 Level 1) 100 % at 6.206 Hz Output: 0.29 Volts peak NEMA TS-2 2.2.8 -
Demand: 0.5 G Level Time: 1:00:00 Frequency: 6.206 Hz
Control: 0.5002 G Total Time: 1:00:11 End of Timed Test

X axis



5/30, 2024 12:04:14 Level 1) 100 % at 5.004 Hz Output: 0.3581 Volts peak NEMA TS-2 2.2.8 - 2
Demand: 0.5 G Level Time: 0:30:00 Frequency: 5.004 Hz
Control: 0.4976 G Total Time: 0:30:13 End of Timed Test

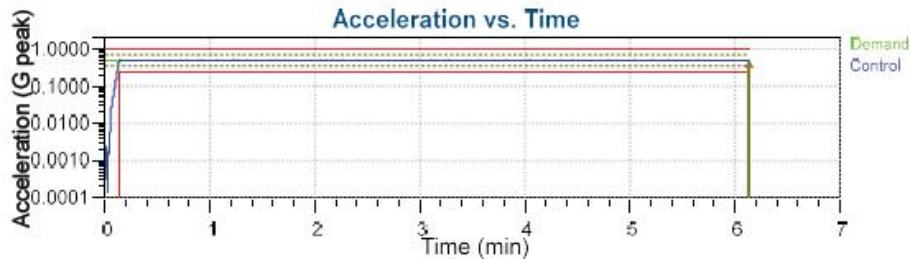
Y axis – 5.004 Hz



5/30, 2024 13:59:41 Level 1) 100 % at 5.29 Hz Output: 0.331 Volts peak NEMA TS-2 2.2.8 -
Demand: 0.5 G Level Time: 0:30:00 Frequency: 5.29 Hz
Control: 0.5 G Total Time: 0:30:29 End of Timed Test

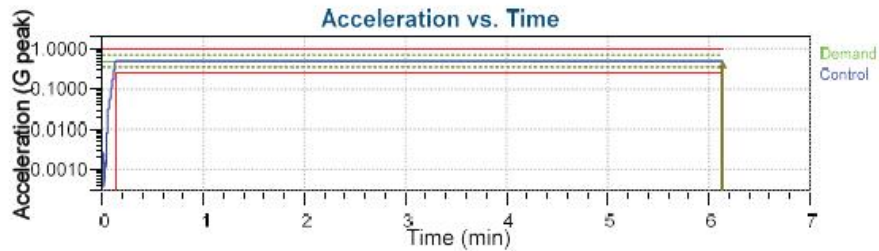
Y axis – 5.29 Hz

[Endurance Test[NEMA TS 2-2013 2.2.8.4]



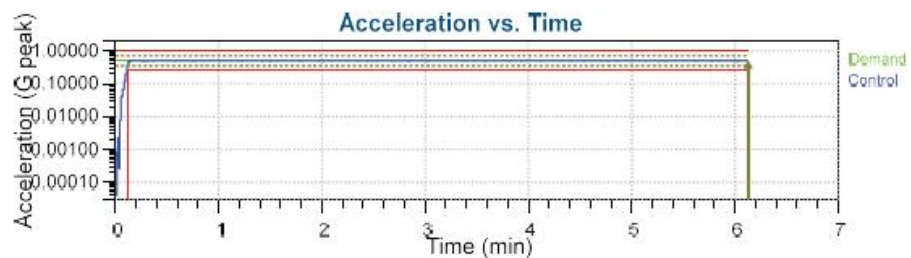
5/30, 2024 15:53:14 Level 1) 100 % at 17.38 Hz Output: 0.0856 Volts peak NEMA TS-2 2.2.8 - 2
Demand: 0.5 G Level Time: 0:06:00 Frequency: 17.38 Hz
Control: 0.501 G Total Time: 0:06:00 End of Timed Test

Z axis – 17.38 Hz



5/30, 2024 16:05:00 Level 1) 100 % at 18.84 Hz Output: 0.07918 Volts peak NEMA TS-2 2.2.8 - 2
Demand: 0.5 G Level Time: 0:06:00 Frequency: 18.84 Hz
Control: 0.4988 G Total Time: 0:06:00 End of Timed Test

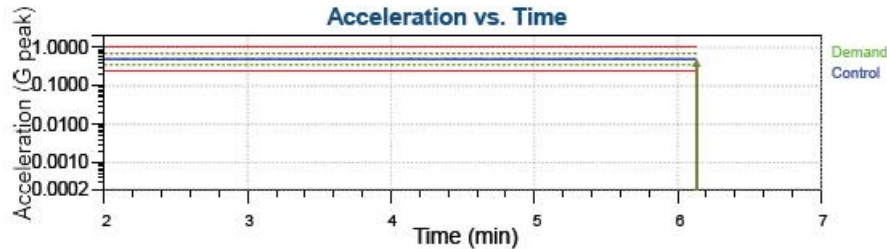
Z axis – 18.84 Hz



5/30, 2024 16:39:41 Level 1) 100 % at 21.3 Hz Output: 0.07725 Volts peak NEMA TS-2 2.2.8 - 2
Demand: 0.5 G Level Time: 0:06:00 Frequency: 21.3 Hz
Control: 0.5005 G Total Time: 0:06:00 End of Timed Test

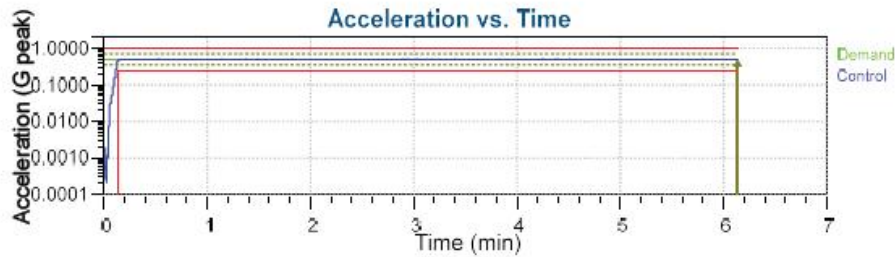
Z axis – 21.30 Hz

[Endurance Test[NEMA TS 2-2013 2.2.8.4]



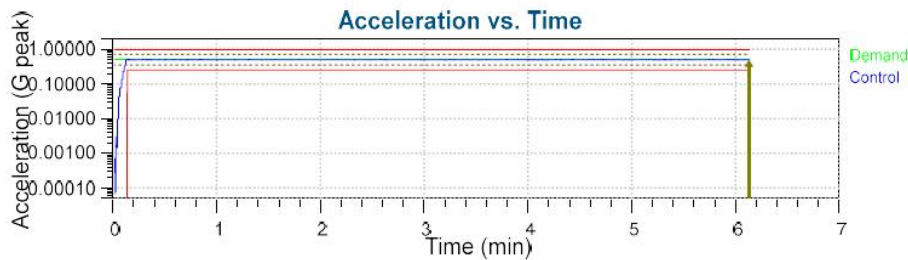
5/30, 2024 16:30:51 Level 1) 100 % at 23.49 Hz Output: 0.07001 Volts peak NEMA TS-2 2.2.8 - 2
Demand: 0.5 G Level Time: 0:06:01 Frequency: 23.49 Hz
Control: 0.4892 G Total Time: 0:06:01 End of Timed Test

Z axis – 23.49 Hz



5/30, 2024 16:16:02 Level 1) 100 % at 23.93 Hz Output: 0.08574 Volts peak NEMA TS-2 2.2.8 - 2
Demand: 0.5 G Level Time: 0:06:01 Frequency: 23.93 Hz
Control: 0.4985 G Total Time: 0:06:01 End of Timed Test

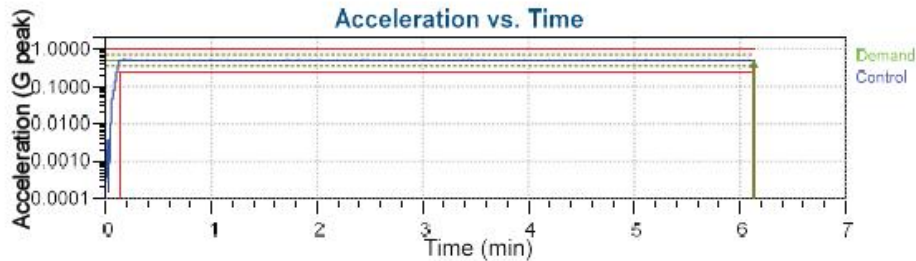
Z axis – 23.93 Hz



5/30, 2024 16:47:21 Level 1) 100 % at 24.04 Hz Output: 0.0672 Volts peak NEMA TS-2 2.2.8 - 2
Demand: 0.5 G Level Time: 0:06:01 Frequency: 24.04 Hz
Control: 0.5037 G Total Time: 0:06:01 End of Timed Test

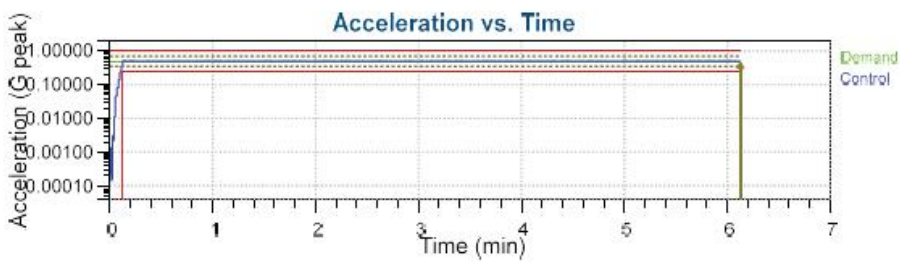
Z axis – 24.04 Hz

[Endurance Test[NEMA TS 2-2013 2.2.8.4]



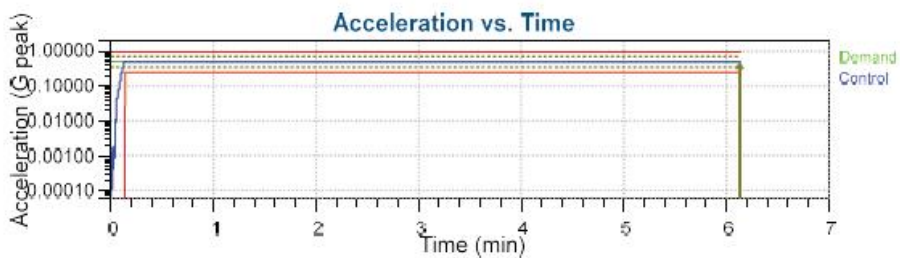
5/30, 2024 16:23:40 Level 1) 100 % at 24.09 Hz Output: 0.0672 Volts peak NEMA TS-2 2.2.8 - 2
Demand: 0.5 G Level Time: 0:06:00 Frequency: 24.09 Hz
Control: 0.5004 G Total Time: 0:06:00 End of Timed Test

Z axis – 24.09 Hz



5/30, 2024 17:03:10 Level 1) 100 % at 24.43 Hz Output: 0.06658 Volts peak NEMA TS-2 2.2.8 - 2
Demand: 0.5 G Level Time: 0:06:00 Frequency: 24.43 Hz
Control: 0.5017 G Total Time: 0:06:00 End of Timed Test

Z axis – 24.43 Hz



5/30, 2024 17:10:20 Level 1) 100 % at 24.5 Hz Output: 0.06571 Volts peak NEMA TS-2 2.2.8 - 2
Demand: 0.5 G Level Time: 0:06:00 Frequency: 24.5 Hz
Control: 0.5025 G Total Time: 0:06:00 End of Timed Test

Z axis – 24.50 Hz



CTK Co., Ltd.

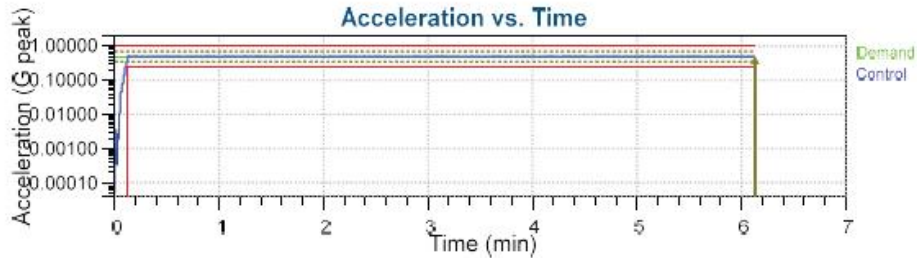
5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si,
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Tel: +82-31-339-9970
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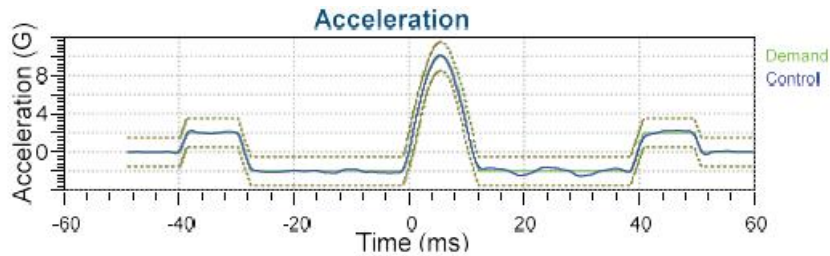
[Endurance Test[NEMA TS 2-2013 2.2.8.4]



5/30, 2024 16:55:11 Level 1) 100 % at 24.63 Hz Output: 0.06634 Volts peak NEMA TS-2 2.2.8 - 2
Demand: 0.5 G Level Time: 0:06:01 Frequency: 24.63 Hz
Control: 0.4994 G Total Time: 0:06:08 End of Timed Test

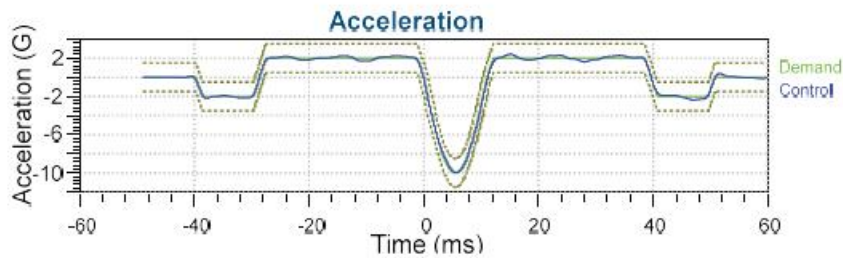
Z axis – 24.63 Hz

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



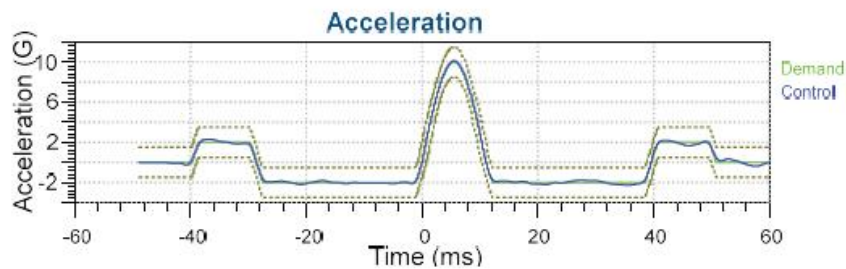
5/30, 2024 11:08:11 Level 1) 100 % Output: 0.7367 Volts pe NEMA TS-2 2.2
Demand: 10
Control: 10.11 Pulse: 1 of Runnin-

+X axis



5/30, 2024 11:08:11 Level 2) 100 % Output: 0.74 Volts pe NEMA TS-2 2.2
Demand: 10
Control: 9.958 Pulse: 1 of End of Tes

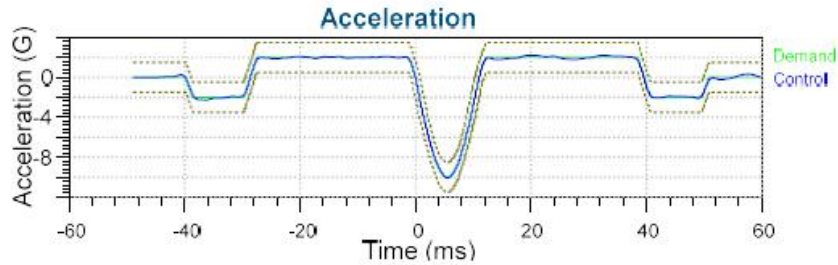
-X axis



5/30, 2024 14:01:11 Level 1) 100 % Output: 0.7349 Volts pe NEMA TS-2 2.2
Demand: 10
Control: 10.11 Pulse: 1 of Runnin-

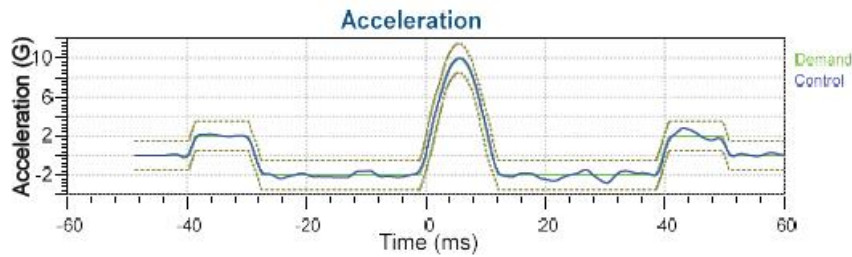
+Y axis

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



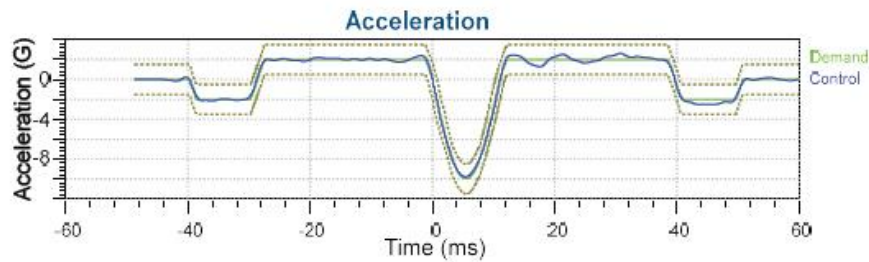
5/30, 2024 14:02:11 Level 2) 100 % Output: 0.7392 Volts peak NEMA TS-2 2.2.2
Demand: 10
Control: 10.07 Pulse: 1 of 1 End of Test

-Y axis



5/30, 2024 17:36:05 Level 1) 100 % Output: 0.7389 Volts peak NEMA TS-2 2.2.2
Demand: 10 G
Control: 9.964 G Pulse: 1 of 1 Running

+Z axis

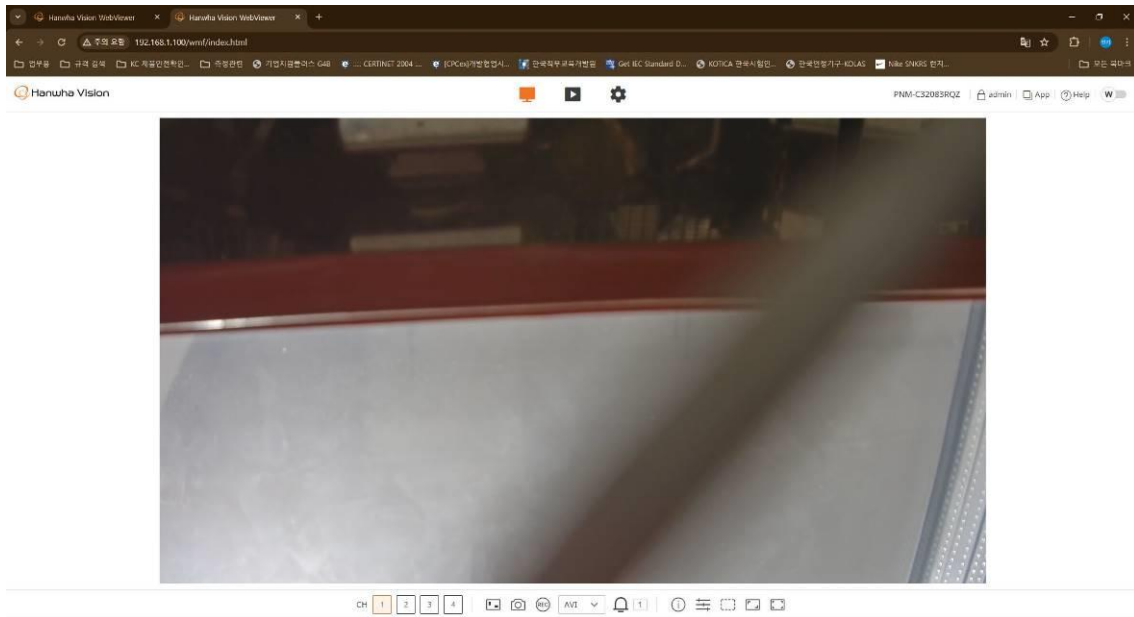


5/30, 2024 17:36:11 Level 2) 100 % Output: 0.7435 Volts peak NEMA TS-2 2.2.2
Demand: 10 G
Control: 9.806 G Pulse: 1 of 1 End of Test

-Z axis

4.3 Post-Test Product Images

4.3.1 Verification of Normal Operation after testing



Verification of Normal Operation after testing

- End -