

TEST REPORT



CTK Co., Ltd.

5 Dongbu-ro, 221beon-gil, Cheoin-gu, Yongin-si
Gyeonggi-do, Republic of Korea
Tel: +82-31-339-9970
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REPORT No.:

CTK-2025-01616

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1. Applicant

- Name : Hanwha Vision Co., Ltd
- Address : 6 Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, 13488 KOREA
- Date of Receipt : Apr. 16, 2025

2. Manufacturer

- Name : Hanwha Vision Co., Ltd

3. Use of Report :

For submission to customer

4. Test sample / Model :

Network Thermal Camera / TNO-C3080T

5. Date(s) of test :

Apr. 22, 2025 ~ May. 14, 2025

6. Test Standard (Method) used :

EN 60068-2-1, EN 60068-2-2, EN 60068-2-14, EN 60068-2-6, EN 60068-2-27, EN 60068-2-78, IEC 60068-2-1, IEC 60068-2-2, IEC 60068-2-14, IEC 60068-2-6, IEC 60068-2-27, IEC 60068-2-78

7. Testing Environment :

Temperature: (25 ±10) °C, Humidity: (50 ±25) % R.H.

Pressure: (96 ±10) kPa

8. Test Results :

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. This report cannot be reproduced or copied without the written consent of CTK.

Approval	Tested by	Technical Manager
	Name: KyuNam Park (Signature)	Name: HoHyun Lee (Signature)

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

Jun. 23, 2025

CTK Co., Ltd.



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1. Testing laboratory

1.1 Testing laboratory information

Lab. Name	CTK Co., Ltd.
Representative	Young Joseph Seungwon
Address	113, Yejik-ro, Cheoin-gu, Yongin-si, Gyeonggi-do Republic of Korea
Tel.	+82-31-339-9970
Fax.	+82-31-624-9501
E-Mail	all.youngin@element.com
Website	www.elementkorea.kr

1.2 Testing laboratory accreditation status

Country	Classification	Accreditation Number	Logo
International	KOLAS	TESTING NO. KT119	

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2. Product description and equipment information

2.1 Product description

Product Name	Model Name	Quantity	Comment
Network Thermal Camera	TNO-C3080T	1 EA	–

2.2 Model description

Basic Model	TNO-C3080T
Series model	TNO-C3082T, TNO-C3060T, TNO-C3062T
Model differences	Use of the same external shape and materials (case, finishing material, PCB, cable, etc.), differences in SW and Fixed Lens.

2.3 Equipment information

Testing equipment	Model Name	Manufacturer	Manufacturing Number	Calibration Date
Temperature & Humidity Chamber	C4-340	Weissttechnik	54260023190010	Feb. 6, 2026
Temperature & Humidity Chamber	ARS-0390-AE	ESPEC	4120200057	Aug. 22, 2025
ESS	EGNZ28-15NW	ESPEC	1738460	Aug. 22, 2025
VIBRATION TESTING SYSTEM	LT1010	FAMTECH	D2012335	N/A
Acceleration sensor	8703A250M5	KISTLER	5830236	Jan. 16, 2026
Acceleration sensor	8703A250M5	KISTLER	5722241	Jan. 16, 2026

2.4 Pre-test product images

2.4.1 Test sample



Top



Bottom



Front



Rear



Left side



Right side



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2.5 Testing equipment images

2.5.1 Test equipment



Temperature & Humidity Chamber



Temperature & Humidity Chamber



ESS



VIBRATION TESTING SYSTEM



8703A250M5



8703A250M5

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3. Cold Test (EN 60068-2-1, IEC 60068-2-1)

3.1 Test date and environmental conditions

3.1.1 Test date: May. 13, 2025 ~ May. 14, 2025

3.1.2 Measured Environmental Conditions

Item	Temperature (°C)	Humidity (% R.H.)	Pressure (kPa)
Measurement	25.1	45.2	93.2

3.2 Test conditions and methods

3.2.1 Sample status: Non-operation

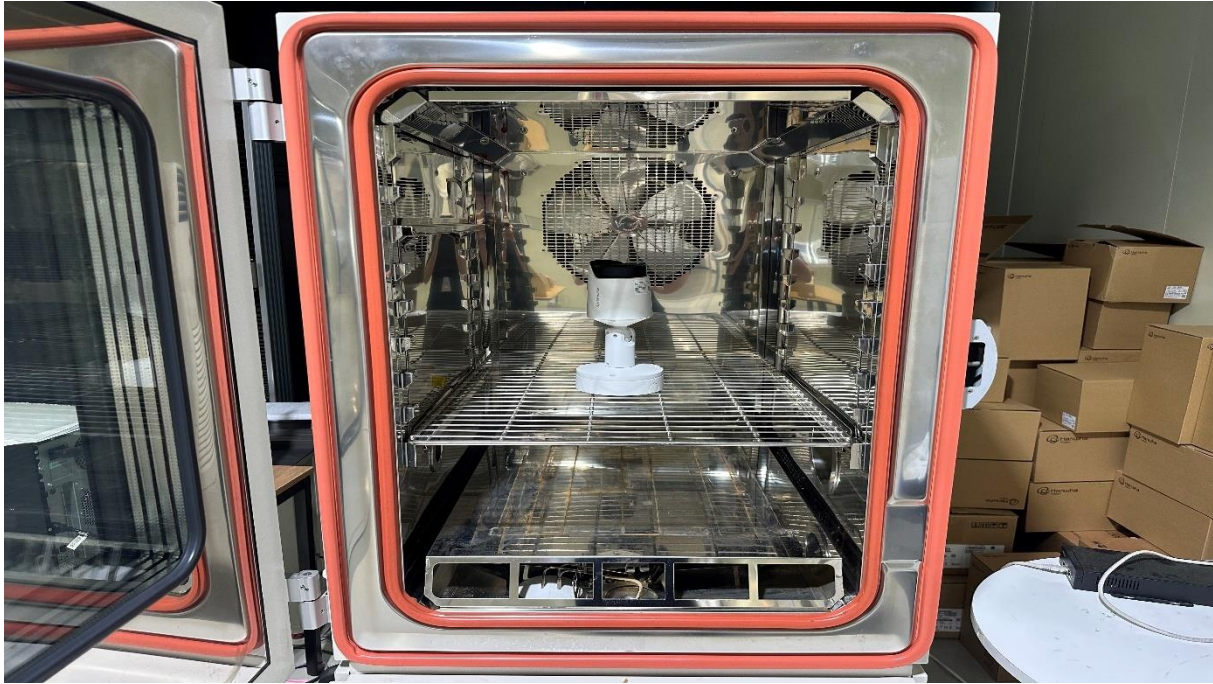
3.2.2 Test temperature: -33 °C

3.2.3 Test time: 16 h

3.2.4 Evaluation Criteria: Verification of Appearance Before and After Testing, and
Confirmation of Proper Product Functionality

3.3 Testing images

3.3.1 Evidence of test setting



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3.4 Test Result**3.4.1 Test Result table**

Evaluations Criteria	Test result		Comment
Sample	Visual Inspection	Normal	-
	Operation and Function	Normal	-



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3.5 Test Data

3.5.1 Test data and graph



Temperature Data

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4. Dry heat Test (EN 60068-2-2, IEC 60068-2-2)

4.1 Test date and environmental conditions

4.1.1 Test date: May. 09, 2025 ~ May. 14, 2025

4.1.2 Measured Environmental Conditions

Item	Temperature (°C)	Humidity (% R.H.)	Pressure (kPa)
Measurement	25.2	47.3	95.1

4.2 Test conditions and methods

4.2.1 Sample status: Non-operation

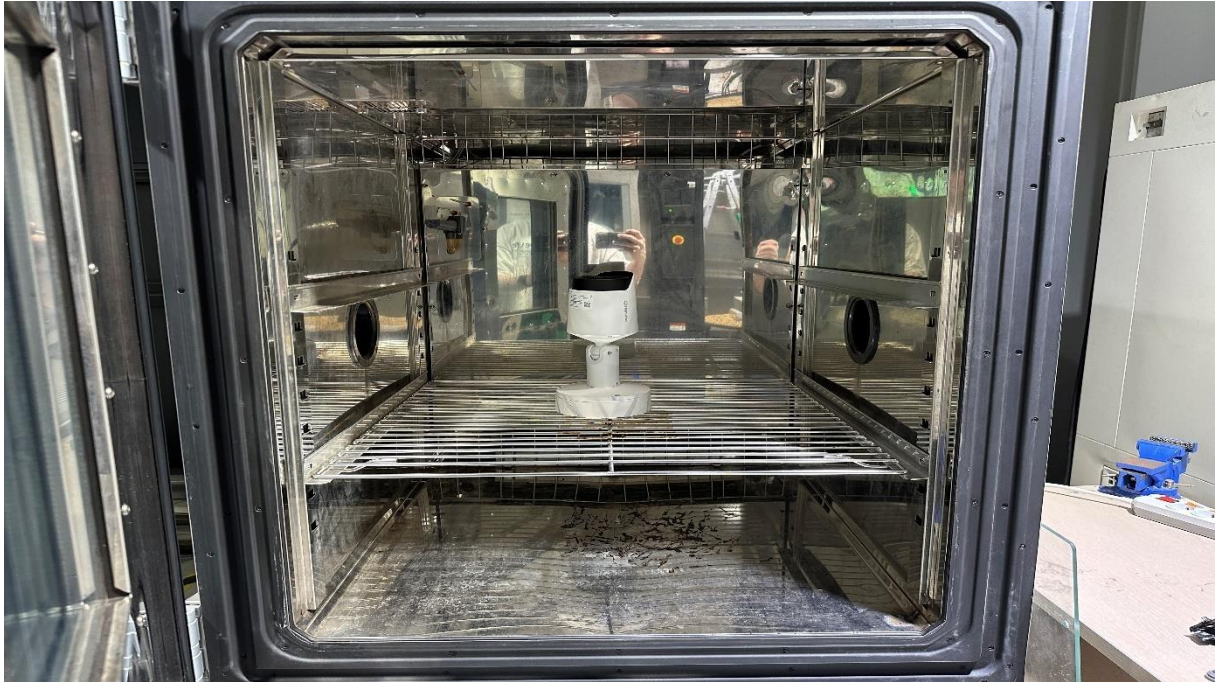
4.2.2 Test temperature: 60 °C

4.2.3 Test time: 96 h

4.2.4 Evaluation Criteria: Verification of Appearance Before and After Testing, and Confirmation of Proper Product Functionality.

4.3 Testing images

4.3.1 Evidence of test setting



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4.4 Test result**4.4.1 Test results table**

Evaluations Criteria	Test result		Comment
Sample	Visual Inspection	Normal	-
	Operation and Function	Normal	-



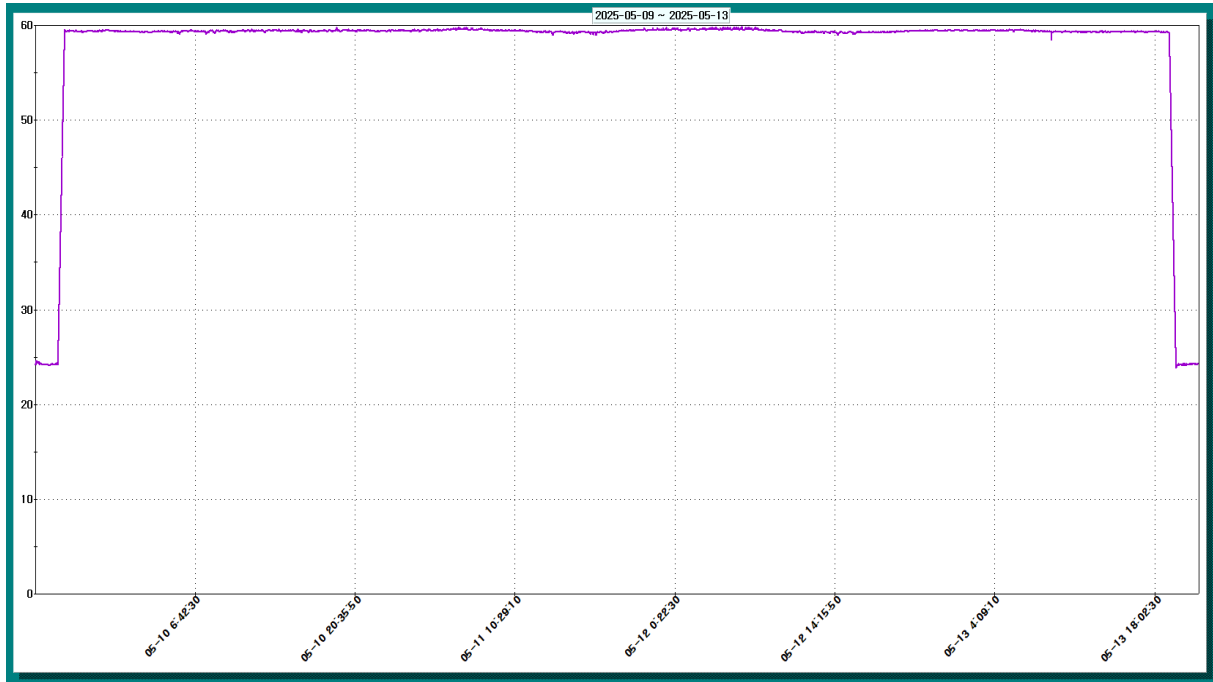
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4.5 Test Data

4.5.1 Test data and graph



Temperature Data

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5. Change of temperature Test (EN 60068-2-14, IEC 60068-2-14)

5.1 Test date and environmental conditions

5.1.1 Test date: May. 13, 2025 ~ May. 14, 2025

5.1.2 Measured Environmental Conditions

Item	Temperature (°C)	Humidity (% R.H.)	Pressure (kPa)
Measurement	25.1	45.2	93.2

5.2 Test conditions and methods

5.2.1 Sample status: operation

5.2.2 Test temperature: -40 °C, 60 °C

5.2.3 Test time: 24 h

5.2.4 Evaluation Criteria: Verification of Appearance Before and After Testing, and Confirmation of Proper Product Functionality.

5.2.5 Test method

Temp↵	Temperature change rate(°C/min)↵	t ₁ (idle time)↵	Cycles↵
High↵	5 °C/min↵	3 h↵	3↵
Low↵	1 °C/min↵	3 h↵	3↵

5.3 Testing images

5.3.1 Evidence of test setting



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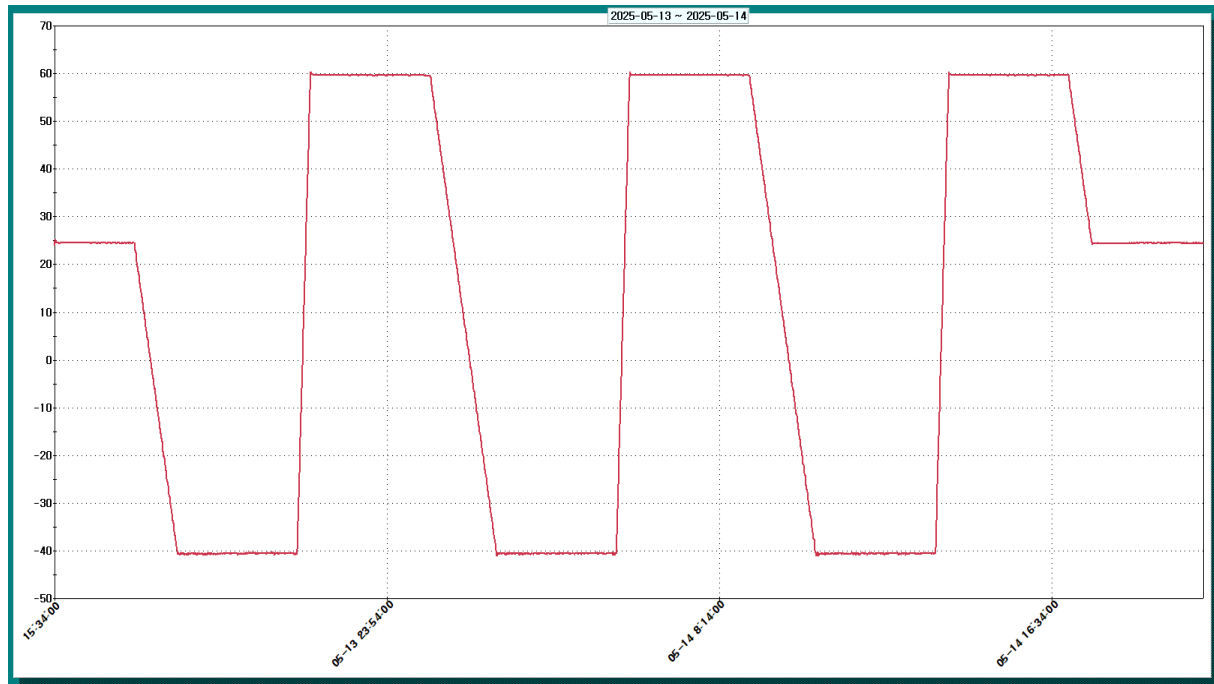
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5.4 Test result**5.4.1 Test results table**

Evaluations Criteria	Test result		Comment
Sample	Visual Inspection	Normal	-
	Operation and Function	Normal	-

5.5 Test Data

5.5.1 Test data and graph



Temperature Data



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5.6 Post-test operation and function

5.6.1 Test sample operation and function



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6. Vibration Test (EN 60068-2-6, IEC 60068-2-6)

6.1 Test date and environmental conditions

6.1.1 Test date: May. 08, 2025 ~ May. 09, 2025

6.1.2 Measured Environmental Conditions

Item	Temperature (°C)	Humidity (% R.H.)	Pressure (kPa)
Measurement	23.1	44.8	94.7

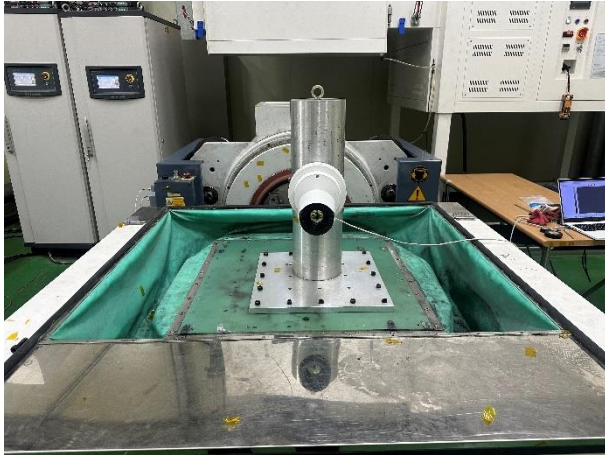
6.2 Test conditions and methods

6.2.1 Vibration Test (EN 60068-2-6)

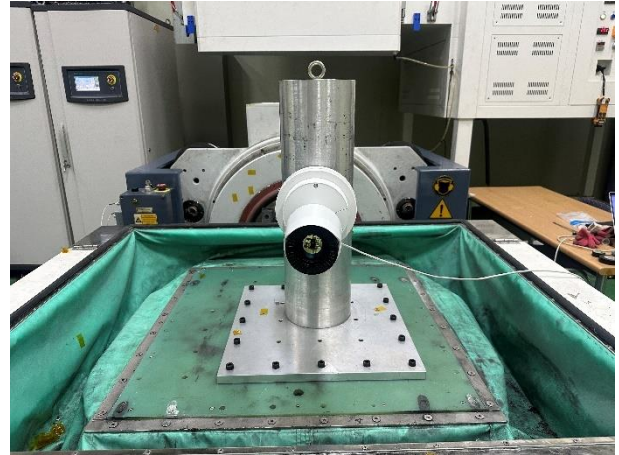
- Sample status: operation
- Frequency(Hz): 5 Hz ~ 200 Hz
- Acceleration(G): 1 G
- Sweep rate: 1 oct/min
- Test Axis: X, Y, Z
- Test time(h): Total 30 min (10 min. per each axis)

6.3 Testing images

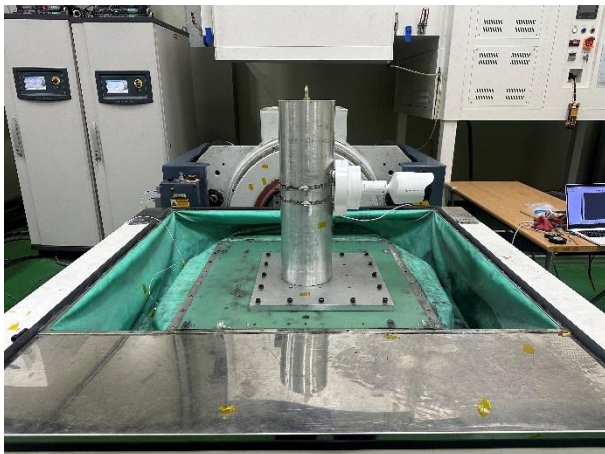
6.3.1 Evidence of test setting



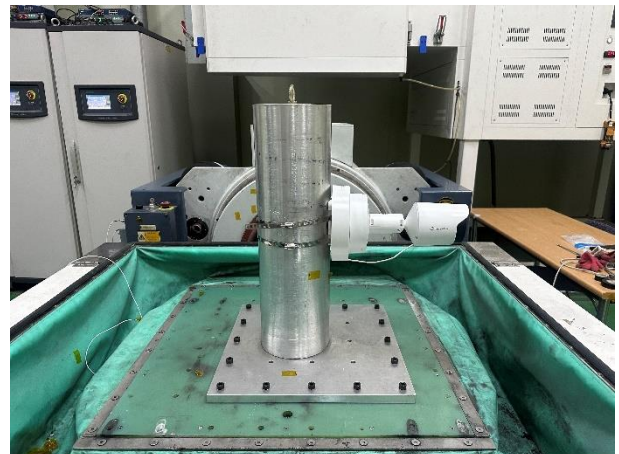
X axis_1



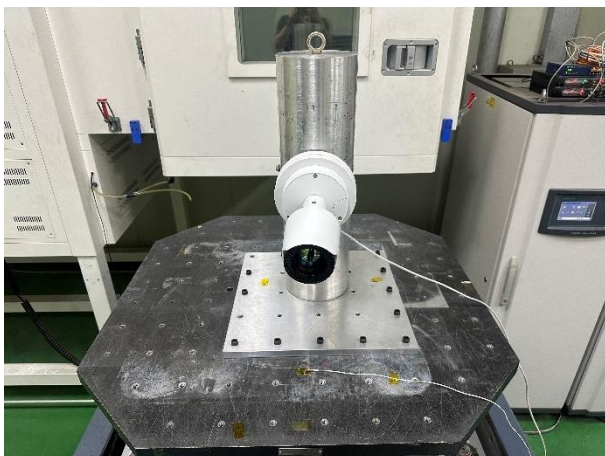
X axis_2



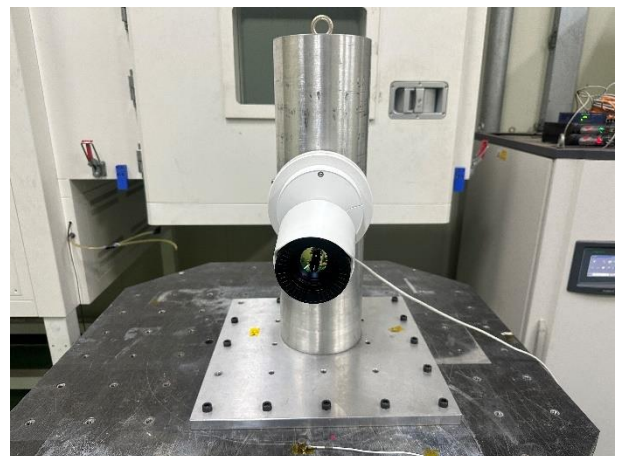
Y axis_1



Y axis_2



Z axis_1



Z axis_2

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6.4 Test result**6.4.1 Test results table**

Evaluations Criteria	Test result		Comment
Vibration Test	Before	Normal	-
	After	Normal	-



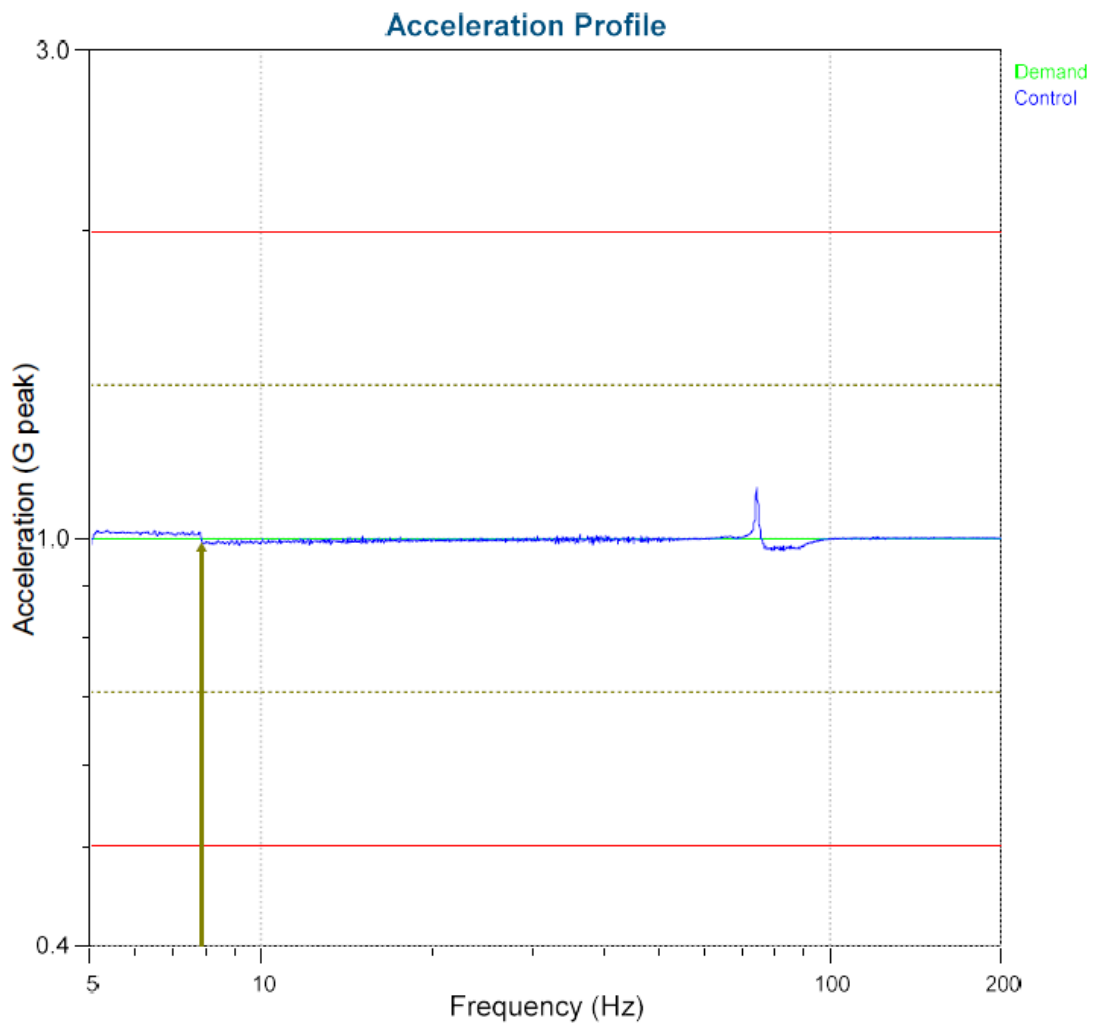
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6.5 Test Data

6.5.1 Test data and graph (Vibration Test X Axis)



5 08, 2025 11:09:28 Level 1) 100 % Output: 0 Volts peak 60068-2-6

Demand: 1 G Level Time: 0:10:00 Frequency: 7.858 Hz

Control: 0.0007916 G Total Time: 0:10:12 End of Timed Test

X Axis

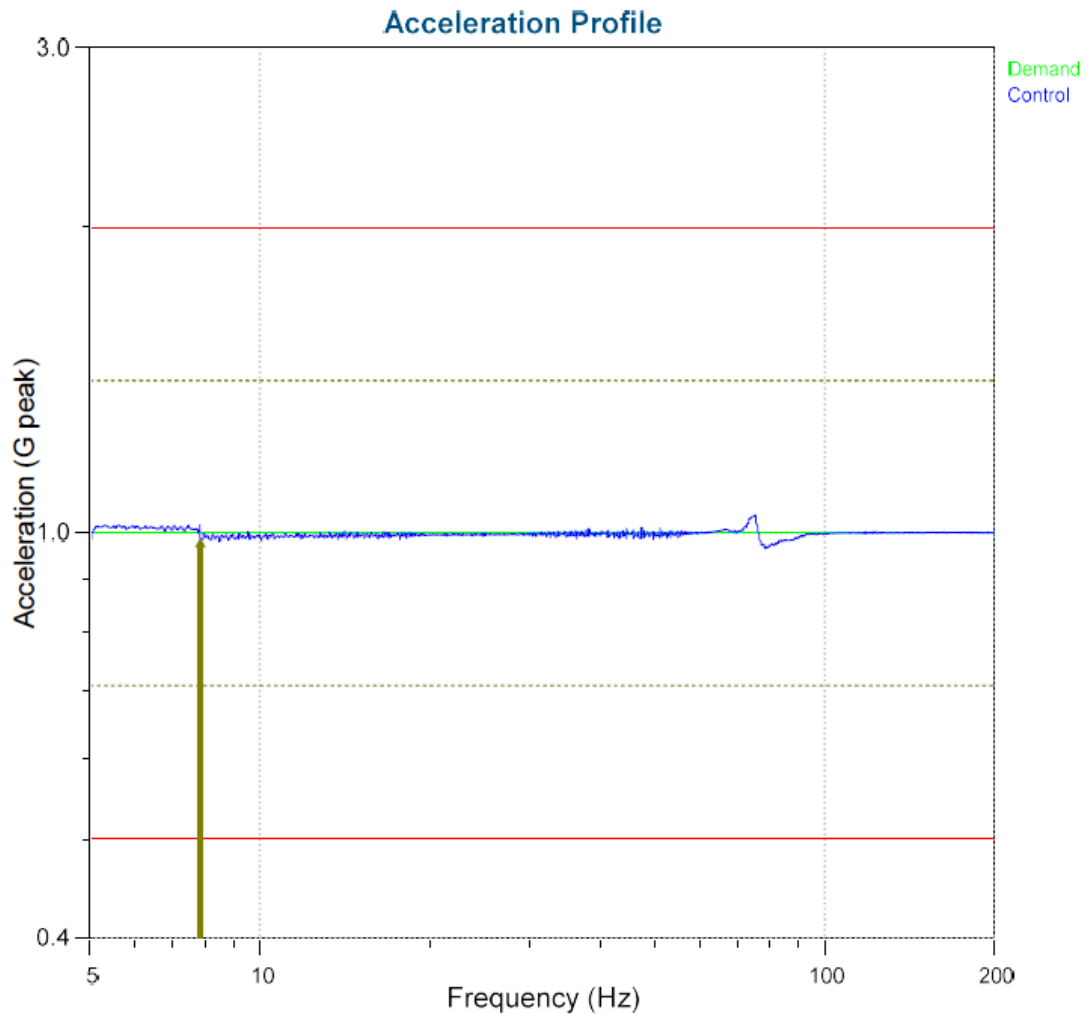


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6.5.2 Test data and graph (Vibration Test Y Axis)



5 08, 2025 13:53:12 Level 1) 100 % Output: 0 Volts peak 60068-2-6

Demand: 1 G Level Time: 0:10:00 Frequency: 7.846 Hz

Control: 0.002231 G Total Time: 0:10:12 End of Timed Test

Y Axis

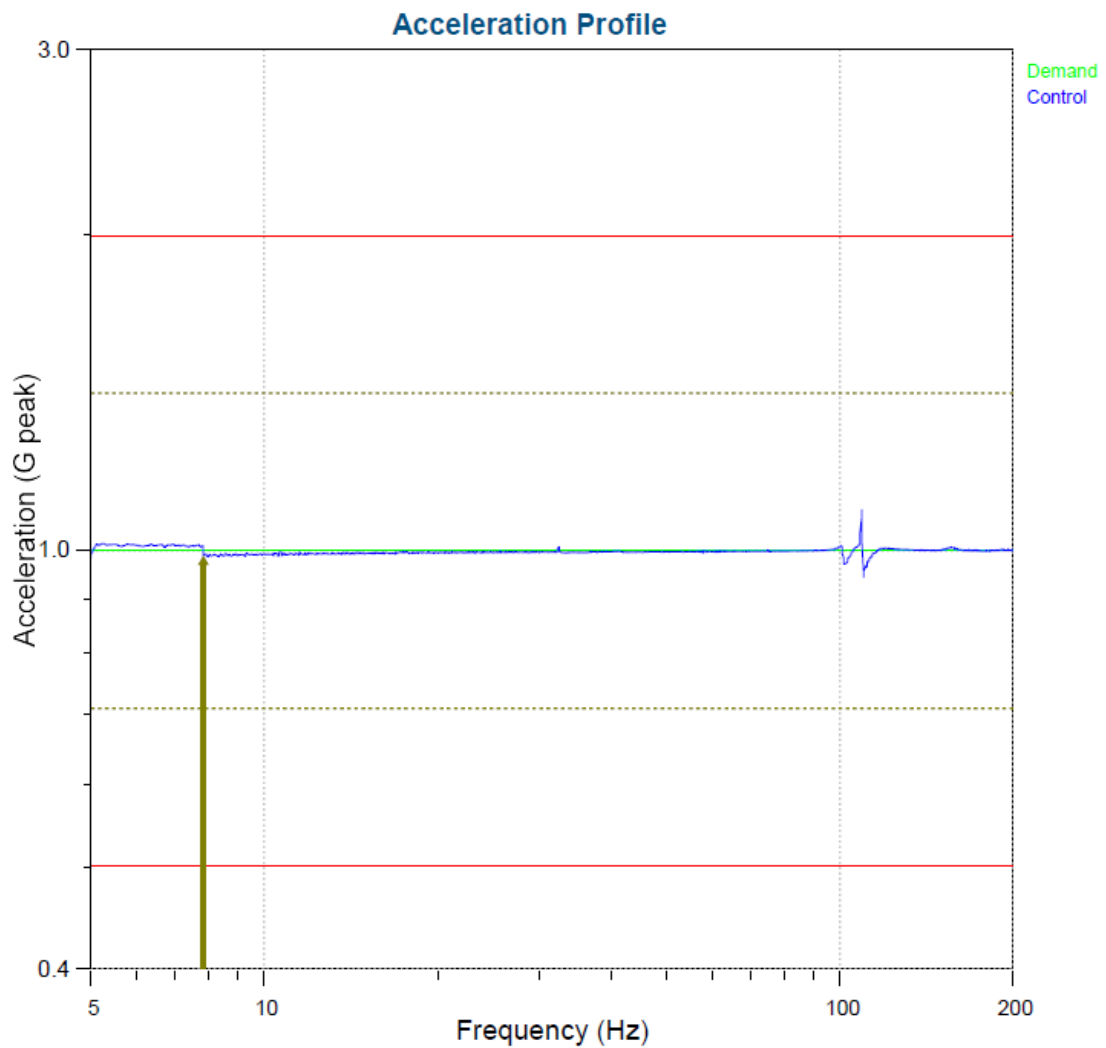


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6.5.3 Test data and graph (Vibration Test Z Axis)



5 09, 2025 09:51:10 Level 1) 100 % Output: 0 Volts peak 60068-2-1

Demand: 1 G Level Time: 0:10:00 Frequency: 7.841 Hz

Control: 0.0002961 G Total Time: 0:10:10 End of Timed Test

Z Axis



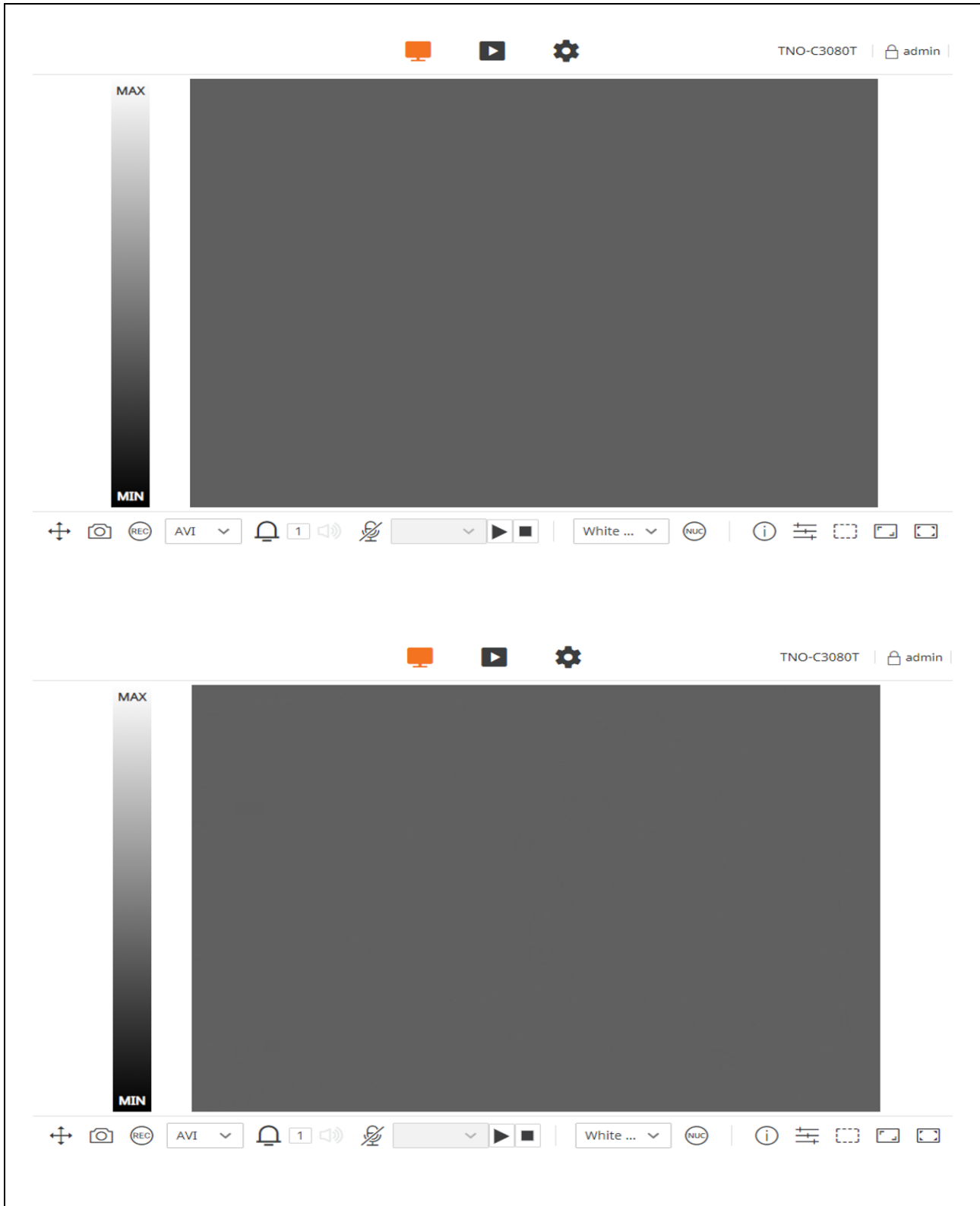
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6.6 Post-test operation and function

6.6.1 Test sample operation and function



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7. Shock Test (EN 60068-2-27, IEC 60068-2-27)

7.1 Test date and environmental conditions

7.1.1 Test date: May. 08, 2025 ~ May. 09, 2025

7.1.2 Measured Environmental Conditions

Item	Temperature (°C)	Humidity (% R.H.)	Pressure (kPa)
Measurement	23.1	44.8	94.7

7.2 Test conditions and methods

7.2.1 Sample status: Non-operation

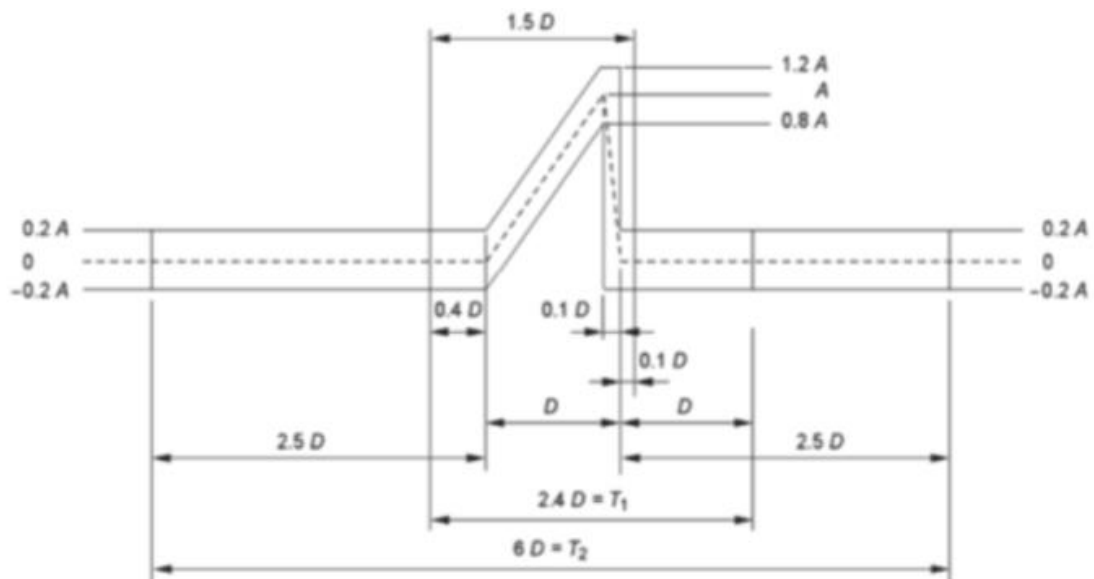
7.2.2 Acceleration(G): 10 G

7.2.3 Number of impacts: 10 per direction (total 60)

7.2.4 Test Axis: X, Y, Z

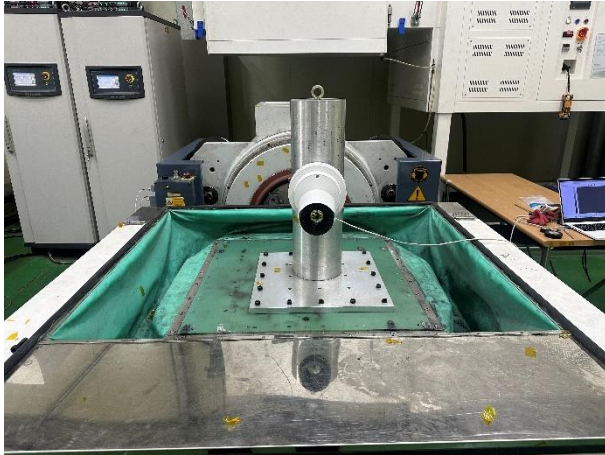
7.2.5 Test time(h): Total 30 min (10 min. per each axis)

7.2.6 Profile

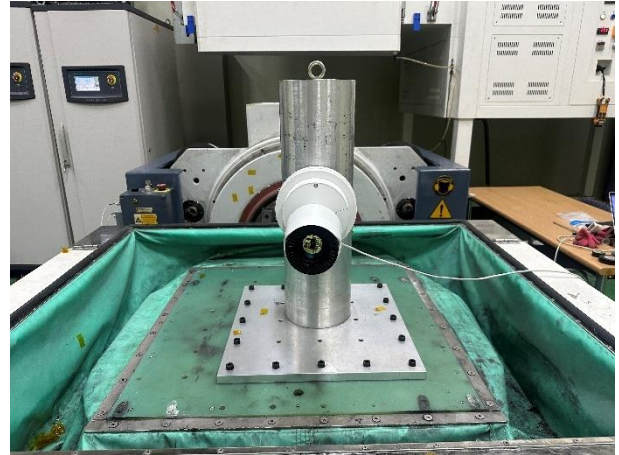


7.3 Testing images

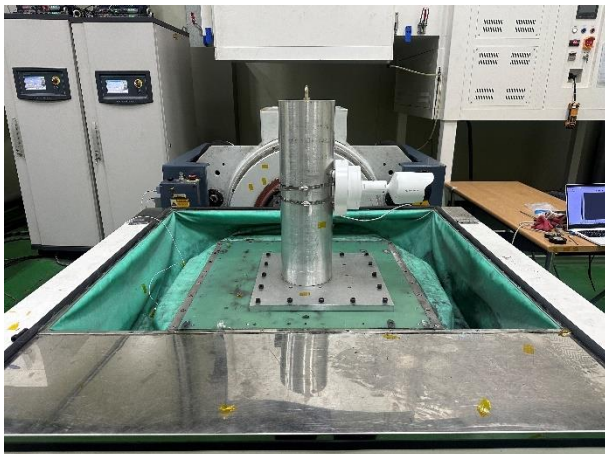
7.3.1 Evidence of test setting



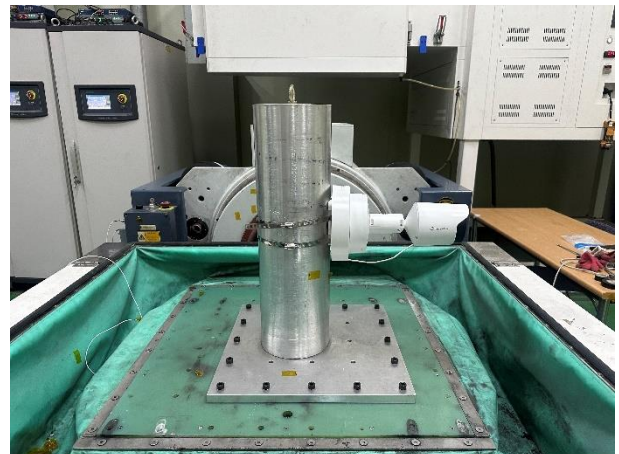
X axis_1



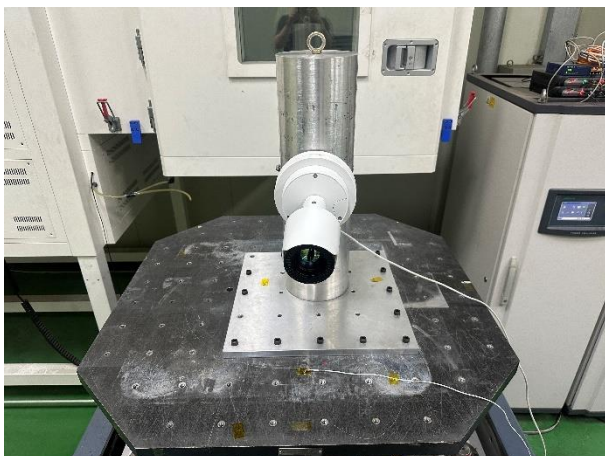
X axis_2



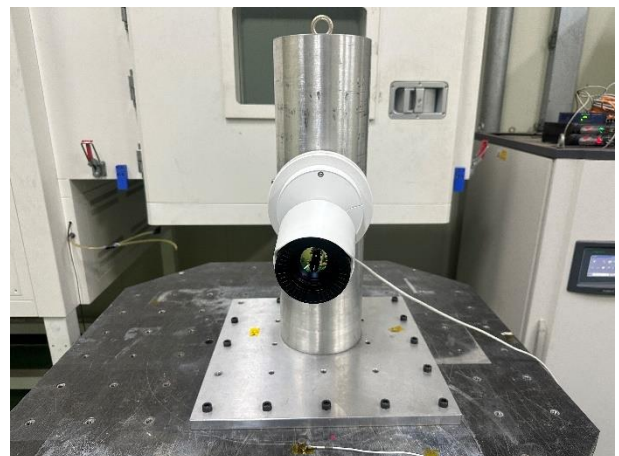
Y axis_1



Y axis_2



Z axis_1



Z axis_2

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7.4 Test result

7.4.1 Test results table

Evaluations Criteria	Test result		비고
Sample	Visual Inspection	Normal	-
	Operation and Function	Normal	-



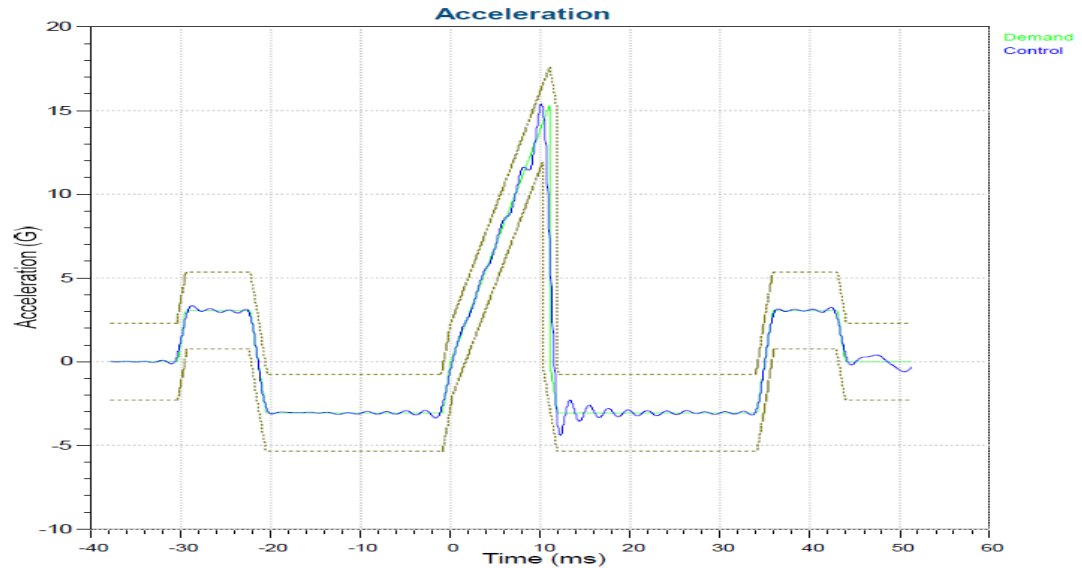
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7.5 Test Data

7.5.1 Test data and graph (Shock Test X Axis)



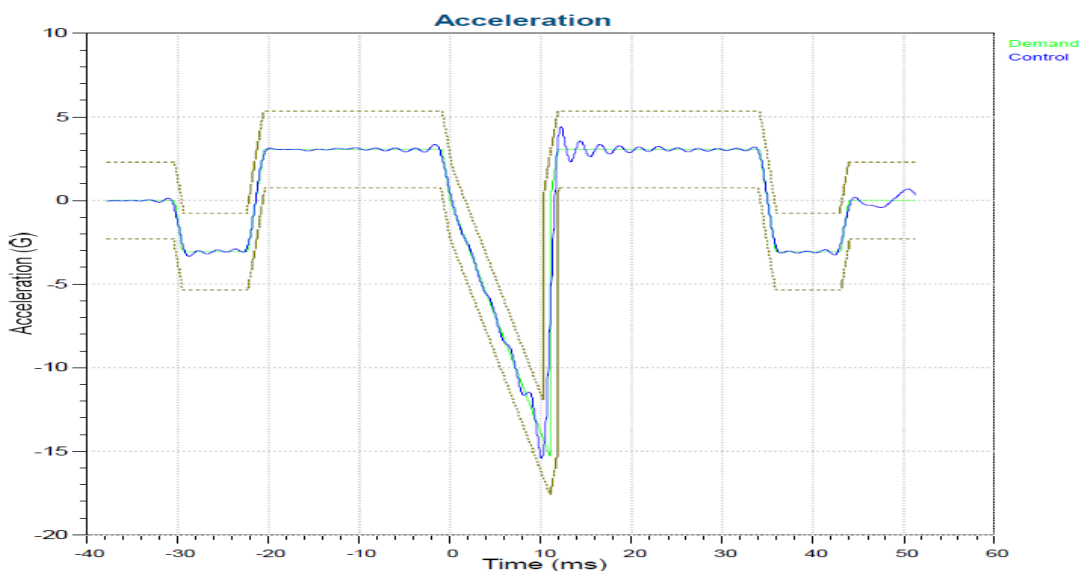
5 08, 2025 11:10:33 Level 1) 100 % Output: 1.145 Volts peak 60068-2-27

Demand: 15.3 G

Control: 15.41 G Pulse: 10 of 10

Running

X+



5 08, 2025 11:11:18 Level 2) 100 % Output: 1.145 Volts peak 60068-2-27

Demand: 15.3 G

Control: 15.43 G Pulse: 10 of 10

End of Test

X-

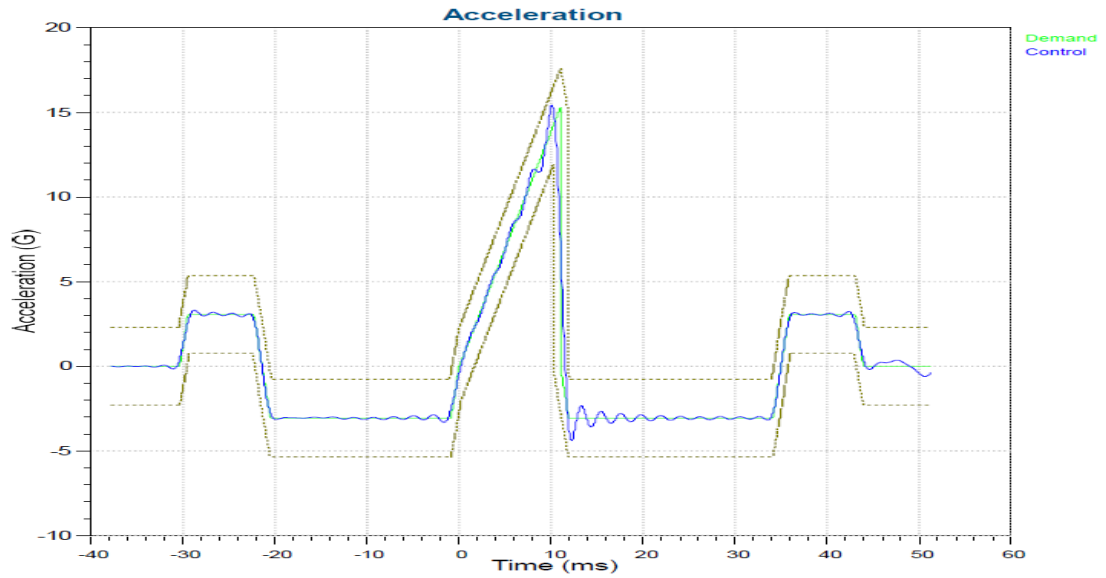


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7.5.2 Test data and graph (Shock Test Y Axis)

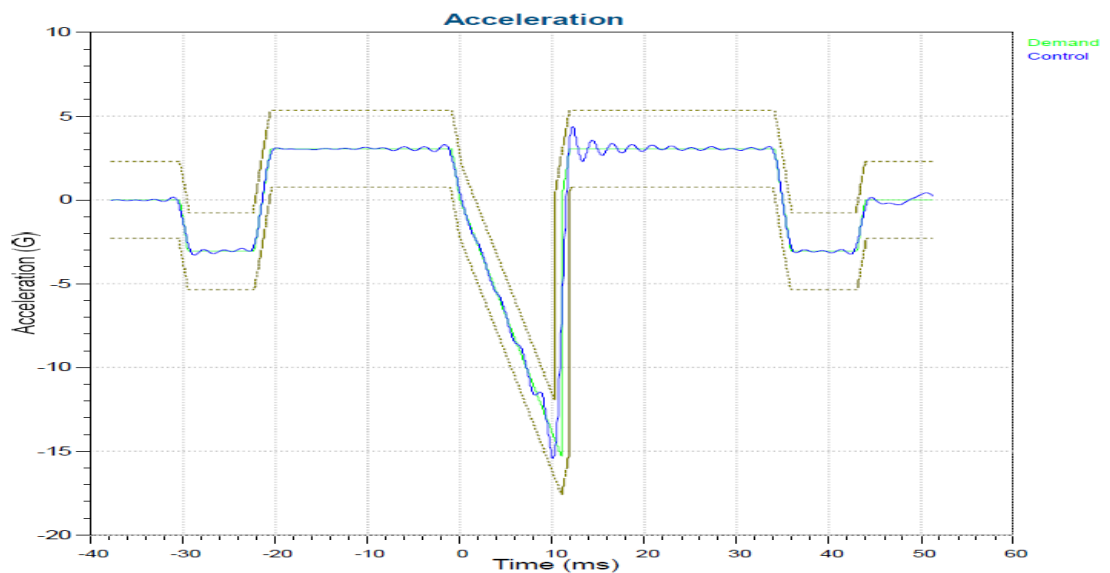


5 08, 2025 13:54:24 Level 1) 100 % Output: 1.16 Volts peak 60068-2-27

Demand: 15.3 G

Control: 15.43 G Pulse: 10 of 10 Running

Y+



5 08, 2025 13:55:03 Level 2) 100 % Output: 1.167 Volts peak 60068-2-27

Demand: 15.3 G

Control: 15.43 G Pulse: 10 of 10 End of Test

Y-

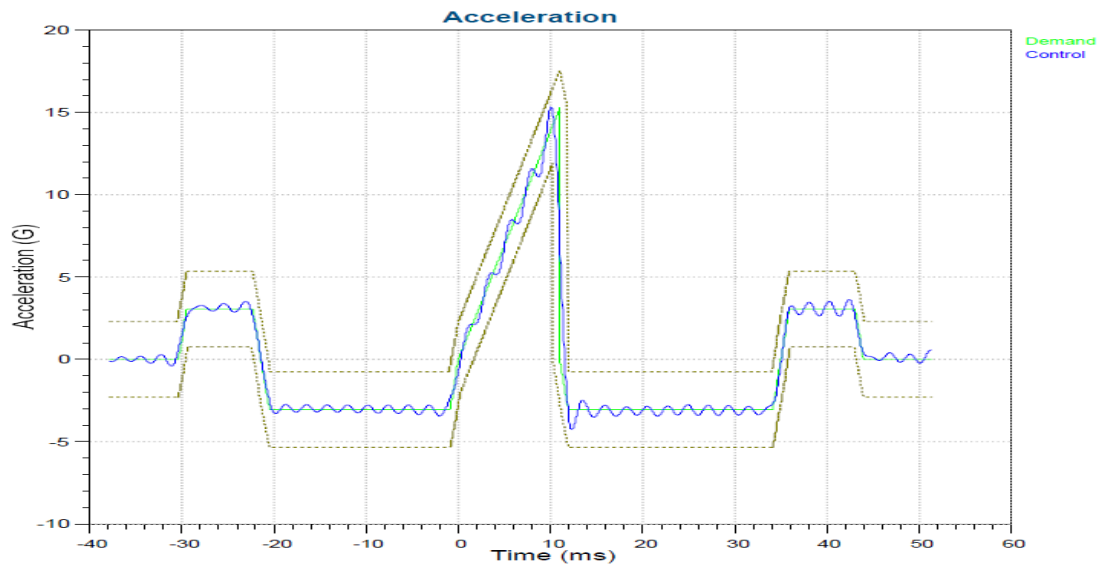


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7.5.3 Test data and graph (Shock Test Z Axis)



5 09, 2025 09:52:38 Level 1) 100 %

Output: 1.308 Volts peak

한화비전 60068-2

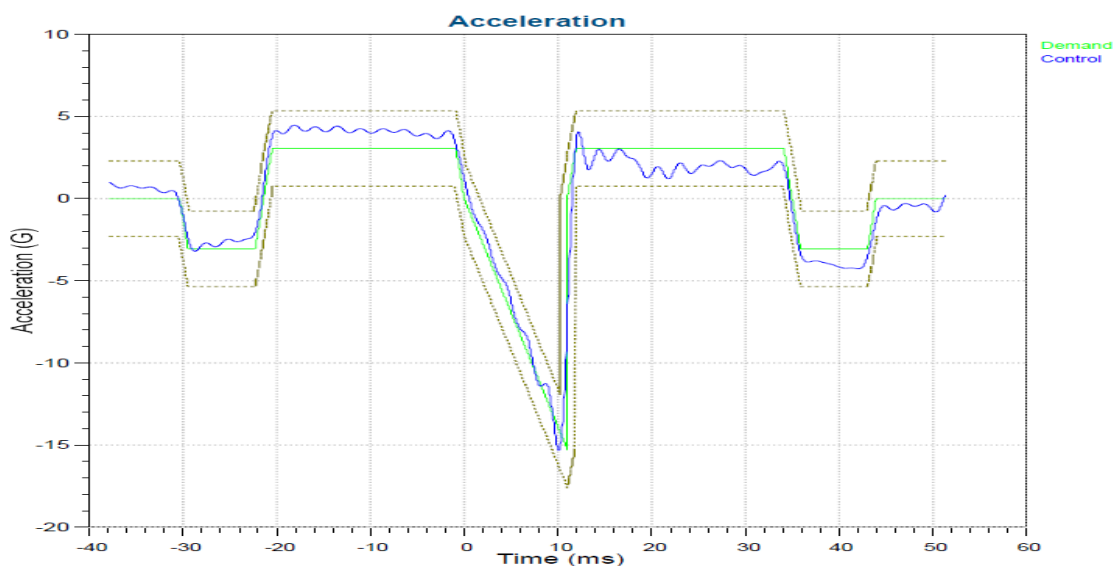
Demand: 15.3 G

Control: 15.34 G

Pulse: 10 of 10

Running

Z+



5 09, 2025 09:54:14 Level 2) 100 %

Output: 1.29 Volts peak

한화비전 60068-2

Demand: 15.3 G

Control: 15.32 G

Pulse: 10 of 10

End of Test

Z-

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8. Damp heat Test (EN 60068-2-78, IEC 60068-2-78)

8.1 Test date and environmental conditions

8.1.1 Test date: Apr. 22, 2025 ~ May. 08, 2025

8.1.2 Measured Environmental Conditions

Item	Temperature (°C)	Humidity (% R.H.)	Pressure (kPa)
Measurement	24.6	43.8	92.6

8.2 Test conditions and methods

8.2.1 Sample status: operation

8.2.2 Test temperature: 40 ± 2 °C

8.2.3 Test Humidity: 93 ± 3 % R.H.

8.2.4 Test time: 240 h

8.2.5 Evaluation Criteria: Verification of Appearance Before and After Testing, and Confirmation of Proper Product Functionality.

8.3 Testing images

8.3.1 Evidence of test setting



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8.4 Test result**8.4.1 Test results table**

Evaluations Criteria	Test result		비고
Sample	Visual Inspection	Normal	-
	Operation and Function	Normal	-



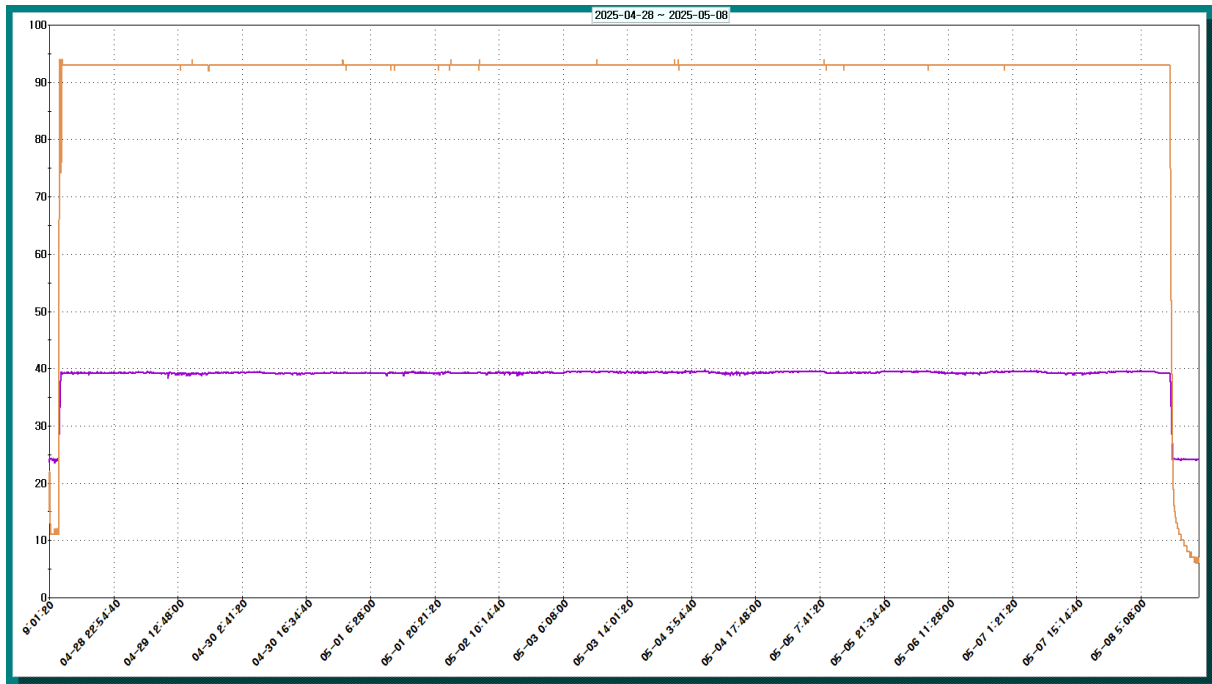
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8.5 Test Data

8.5.1 Test data and graph



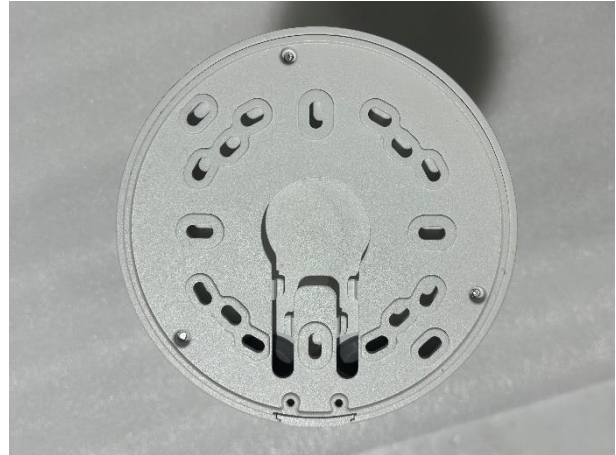
Temperature Data

8.6 Post-test product images

8.6.1 Test sample



Top



Bottom



Front



Rear



Left side



Right side



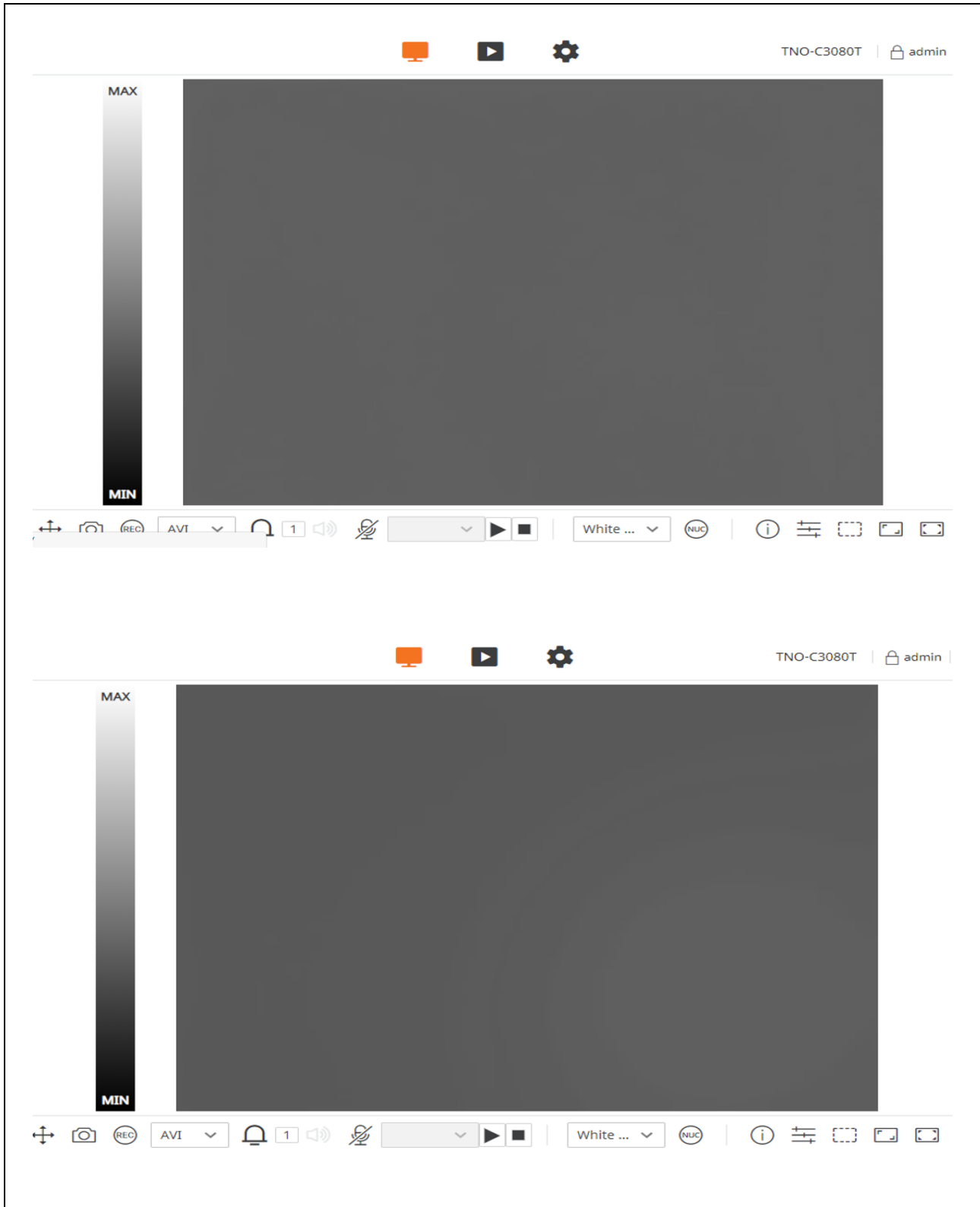
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8.7 Post-test operation and function

8.7.1 Test sample operation and function



- End -