TEST REPORT

CTK Co., Ltd.
5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Republic of Korea
Tel: 1551-9871
Fax: +82-31-624-9501

REPORT No.: CTK-2026-02044

1. Applicant

- Name : Hanwha Vision Co., Ltd
- Address : 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, 13488 KOREA
- Date of Receipt : Jun. 26, 2026

2. Manufacturer

- Name : Hanwha Vision Co., Ltd

3. Use of Report : For submission to customer

4. Test sample / Model : Network Camera / TNO-A9084ER

5. Date(s) of test : Jun. 30, 2026 ~ Jul. 14, 2026

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) ℃, 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.
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Approval	Tested by	Technical Manager
	Name: HongBeom Jeon (Signature)	Name: HoHyun Lee (Signature)

Remark. This report is not related to ISO/IEC 17025, KOLAS accreditation and relevant regulation.

Jul. 24, 2026

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	5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Republic of Korea
Tel.	1551-9871
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	

※ CTK Co., Ltd. is an independent third-party testing laboratory and is not affiliated with the manufacturer (Hanwha Vision Co., Ltd.) or any of its parent or subsidiary companies.

2. Sample description and equipment information

2.1 Sample description

Sample Name	Model Name	S/N	Date of Manufacture	Quantity	Comment
Network Camera	TNO-A9084ER	ZXD770GL60000GN	Jun. 2026	1 EA	-

2.2 Equipment information

Testing equipment	Model Name	Manufacturer	Manufacturing Number	Next Cal. Date
Temperature & Humidity Chamber	ARS-0390-AE	ESPEC	4120200057	Aug. 21, 2026
Temperature & Humidity Chamber	PL-2KP	ESPEC	14008163	Sep. 15, 2026
Temperature & Humidity Chamber	C4-340	Weisstechnik	54260023190010	Feb. 06, 2027
Vibration Testing System	LT1010	FAMTECH	D2012335	-
Vibration Testing System	GT1000M	FAMTECH	D1803072-1	-
Acceleration sensor	8703A250M5	KISTLER	5722241	Jun. 22, 2027

※ All test equipment used for this testing was calibrated in accordance with the manufacturer's requirements, and the calibration ranges cover the measurement values recorded in this report.

2.3 Pre-test sample images

2.3.1 Test sample



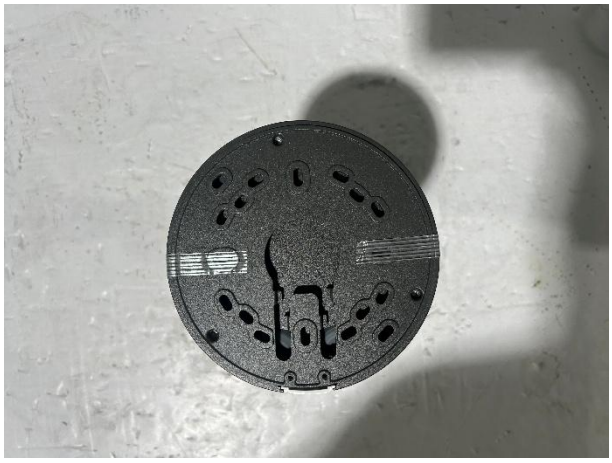
Top



Bottom



Front



Rear



Left side



Right side

2.4 Testing equipment images

2.4.1 Test equipment



Temperature & Humidity Chamber



Vibration Testing System



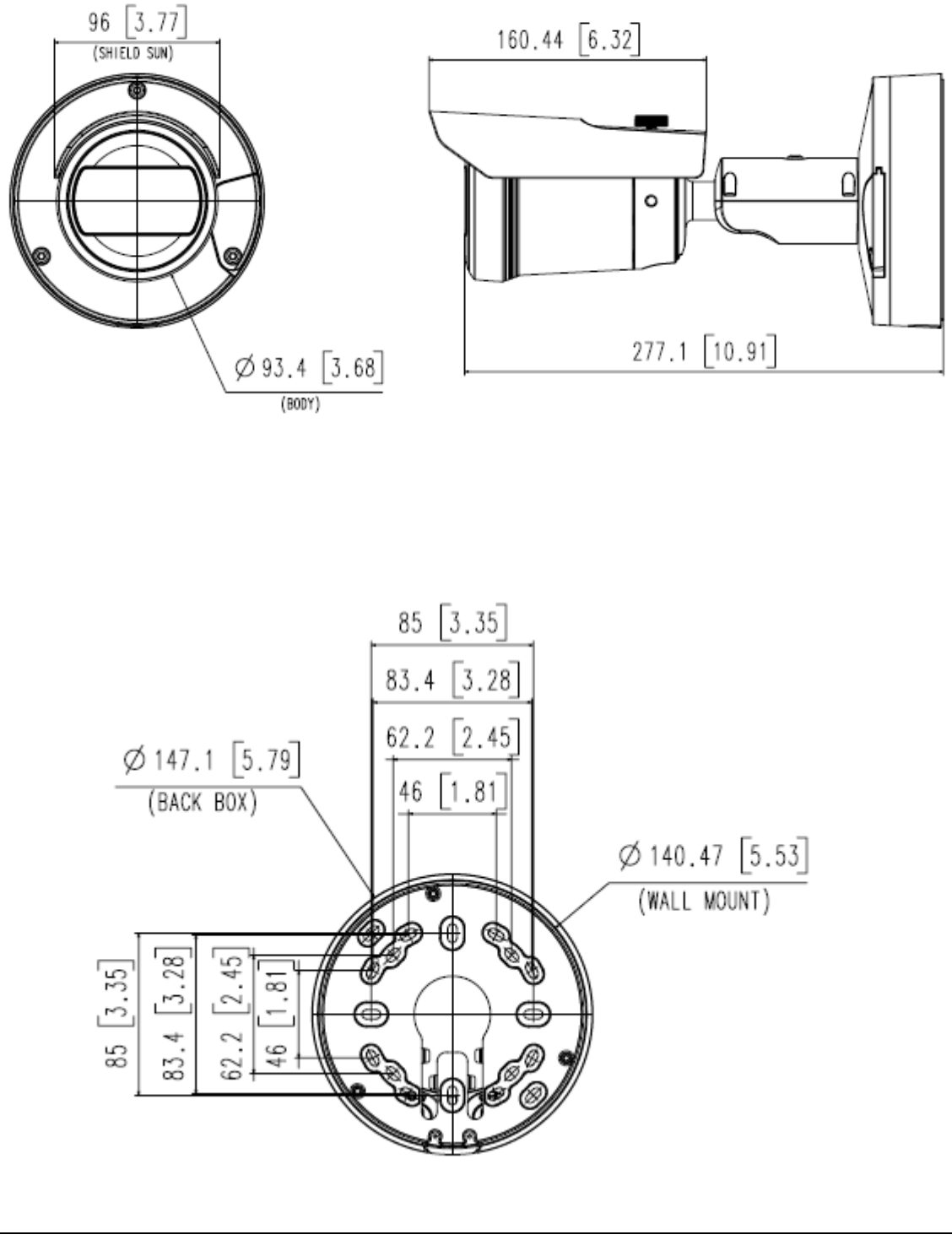
Vibration Testing System



8703A250M5

2.5 Sample appearance

Enclosure dimensions [unit: mm]



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

3.1 Test date and environmental conditions

3.1.1 Test date: Jul. 13, 2026 ~ Jul. 14, 2026

3.1.2 Measured Environmental Conditions

Item	Temperature (℃)	Humidity (% R.H.)	Pressure (kPa)
Measurement	24.8	57.1	97.5

3.2 Test conditions and methods

3.2.1 Preconditioning temperature: 25 °C

3.2.2 Sample status: Operation

3.2.3 Test temperature: -33 °C

3.2.4 Test time: 16 h

3.2.5 Recovery Temperature: 25 °C

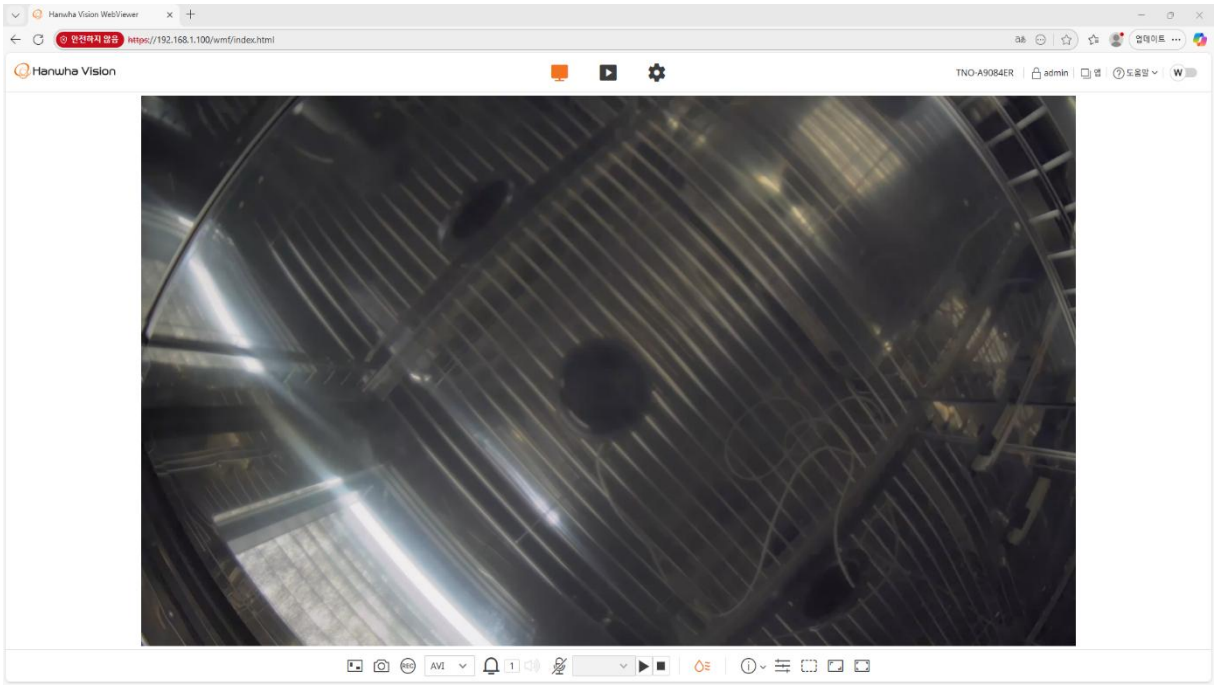
3.2.6 Evaluation items

1) The test sample shall be checked to determine that it is functionally operable in all modes of its prescribed operation

3.3 Test Setup and During test sample images

3.3.1 Evidence of test setting





3.4 Test result

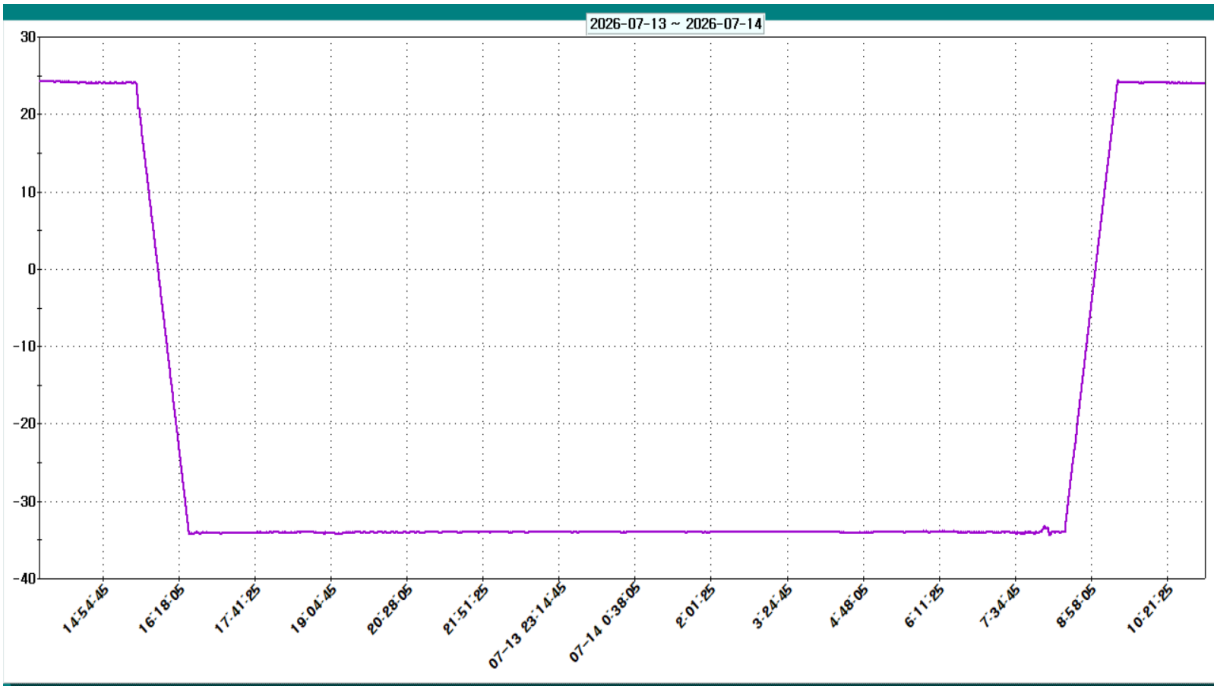
3.4.1 Test result table

Evaluation Criteria	Test Results	Comment
Functional operation	**Pass**	-
Mechanical inspection	**Pass**	-

※ Refer to the sample operation after the completion of testing in section 3.6.

3.5 Test Data

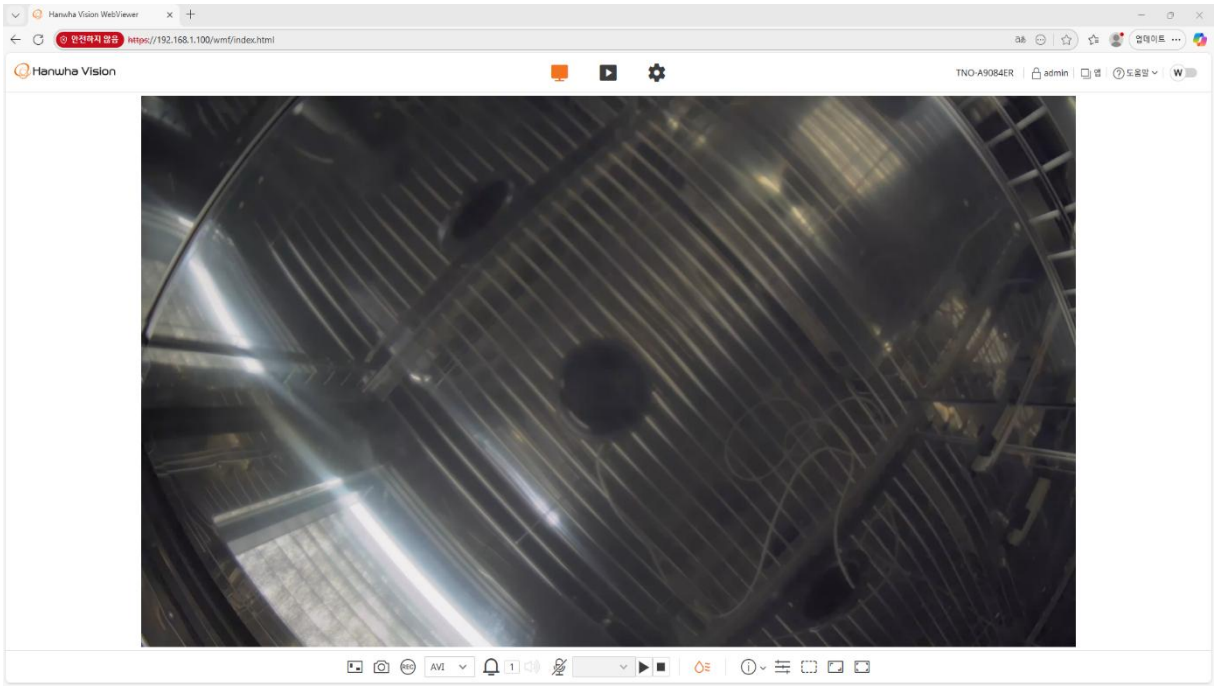
3.5.1 Test data and graph



Temperature Data

3.6 Post-test operation and function

3.6.1 Test sample operation and function



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

4.1 Test date and environmental conditions

4.1.1 Test date: Jun. 30, 2026 ~ Jul. 04, 2026

4.1.2 Measured Environmental Conditions

Item	Temperature (℃)	Humidity (% R.H.)	Pressure (kPa)
Measurement	25.0	55.7	101.1

4.2 Test conditions and methods

4.2.1 Preconditioning temperature: 25 °C

4.2.2 Sample status: Operation

4.2.3 Test temperature: 60 °C

4.2.4 Test time: 96 h

4.2.5 Recovery Temperature: 25 °C

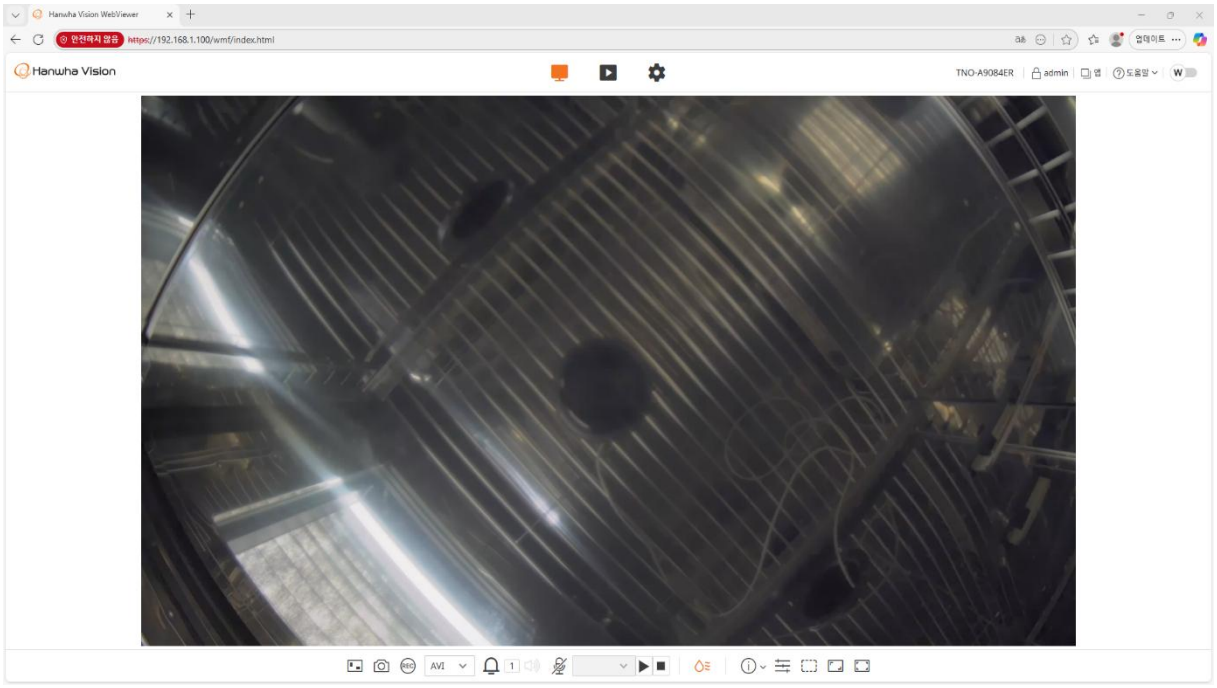
4.2.6 Evaluation items

1) The test sample shall be checked to determine that it is functionally operable in all modes of its prescribed operation

4.3 Test Setup and During test sample images

4.3.1 Evidence of test setting





4.4 Test result

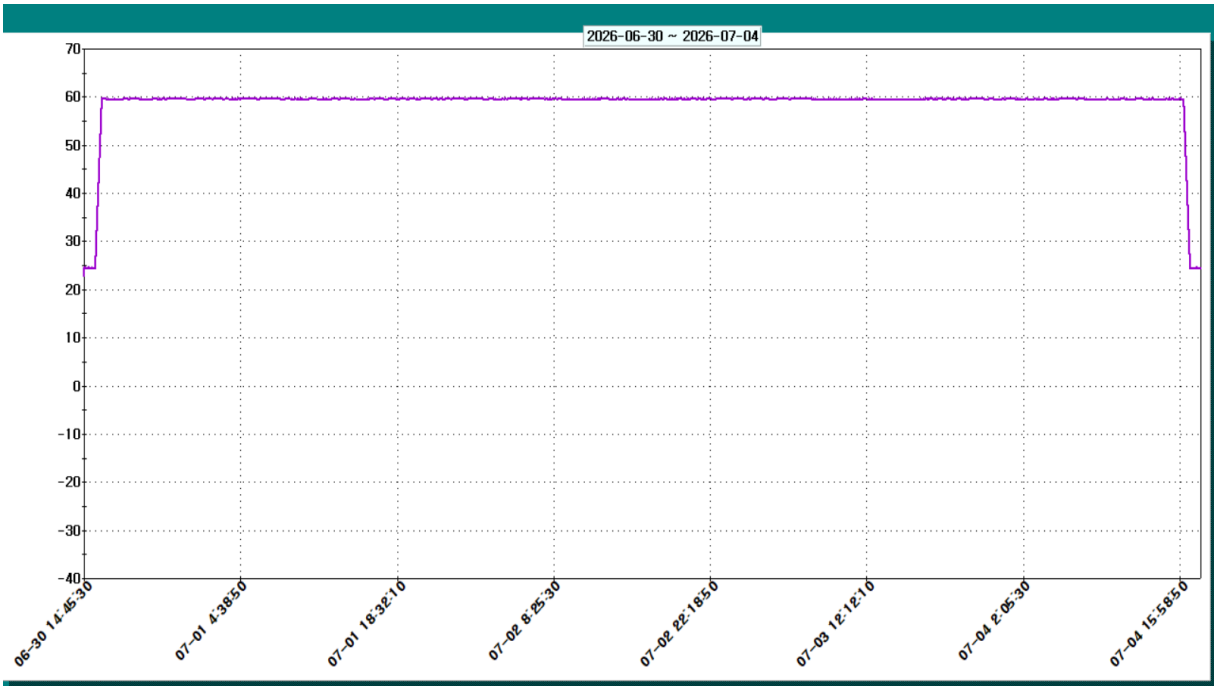
4.4.1 Test result table

Evaluation Criteria	Test Results	Comment
Functional operation	**Pass**	-
Mechanical inspection	**Pass**	-

※ Refer to the sample operation after the completion of testing in section 4.6.

4.5 Test Data

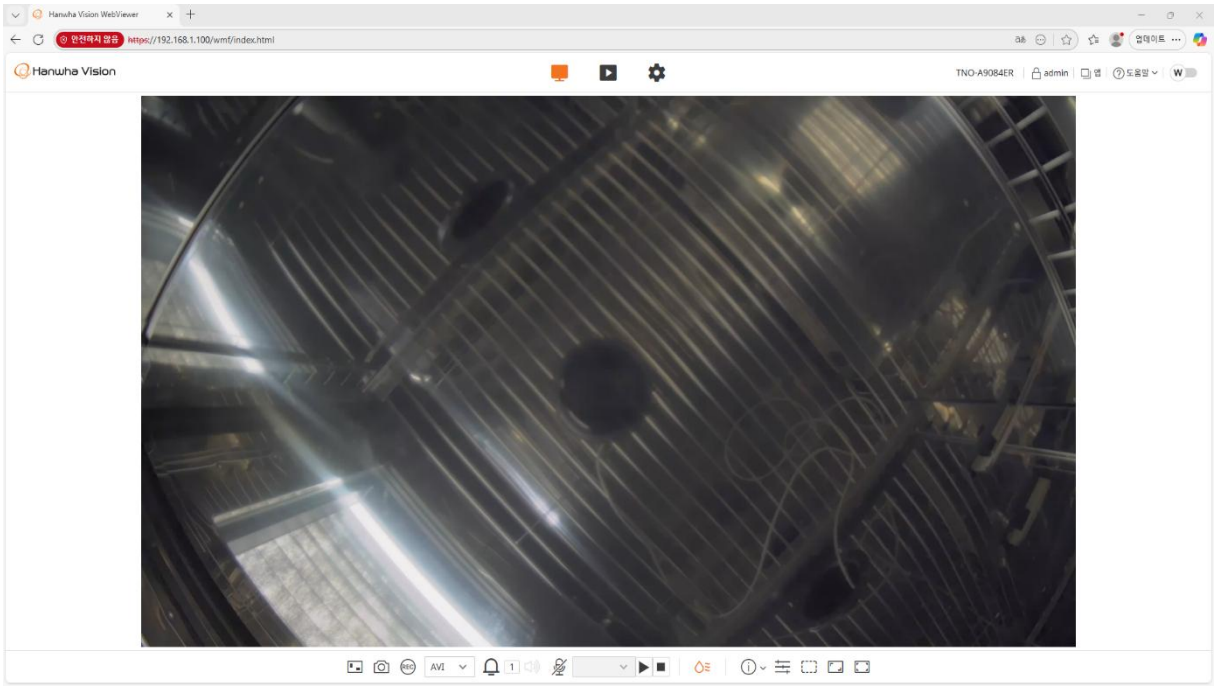
4.5.1 Test data and graph



Temperature Data

4.6 Post-test operation and function

4.6.1 Test sample operation and function



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

5.1 Test date and environmental condition

5.1.1 Test date: Jul. 04, 2026 ~ Jul. 05, 2026

5.1.2 Measured Environmental Conditions

Item	Temperature (℃)	Humidity (% R.H.)	Pressure (kPa)
Measurement	25.2	58.7	94.7

5.2 Test conditions and methods

5.2.1 Sample status: operation

5.2.2 Test temperature: -33 °C, 60 °C

5.2.3 Evaluation items

1) The test sample shall be checked to determine that it is functionally operable in all modes of its prescribed operation

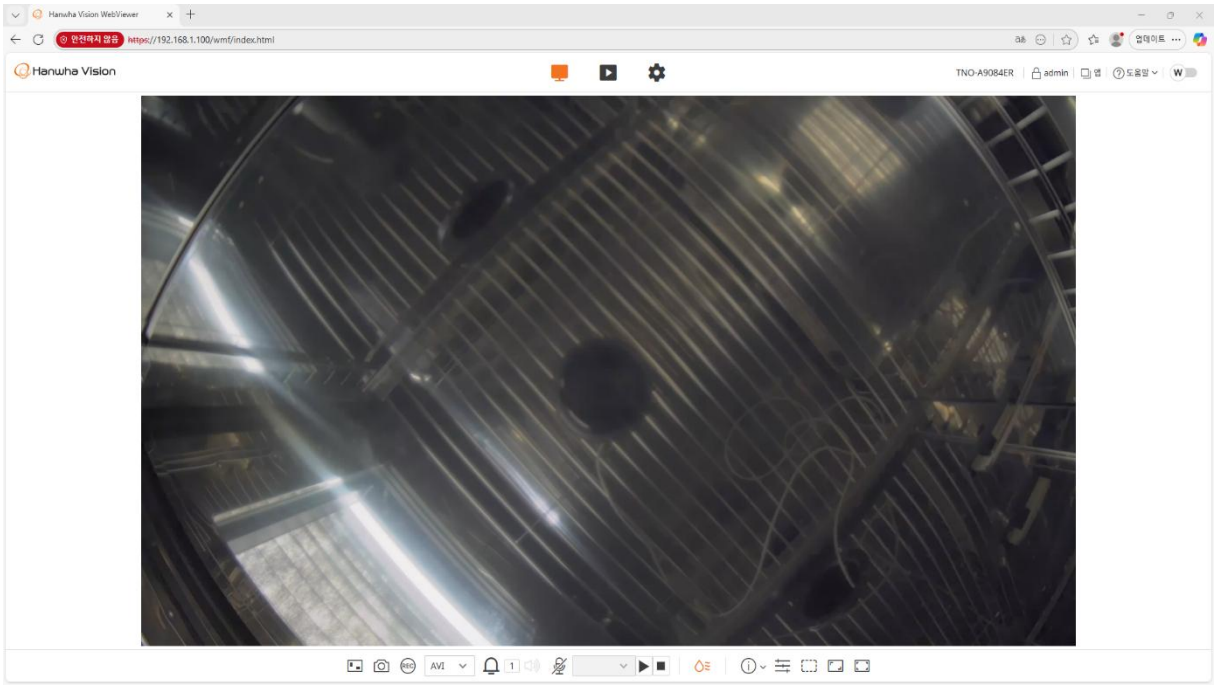
5.2.4 Test method

Temp	Temperature change rate(℃/min)	t_1(idle time)	Cycles
High	5 ℃/min	3 h	3
Low	1 ℃/min	3 h	3

5.3 Test Setup and During test sample images

5.3.1 Evidence of test setting





5.4 Test result

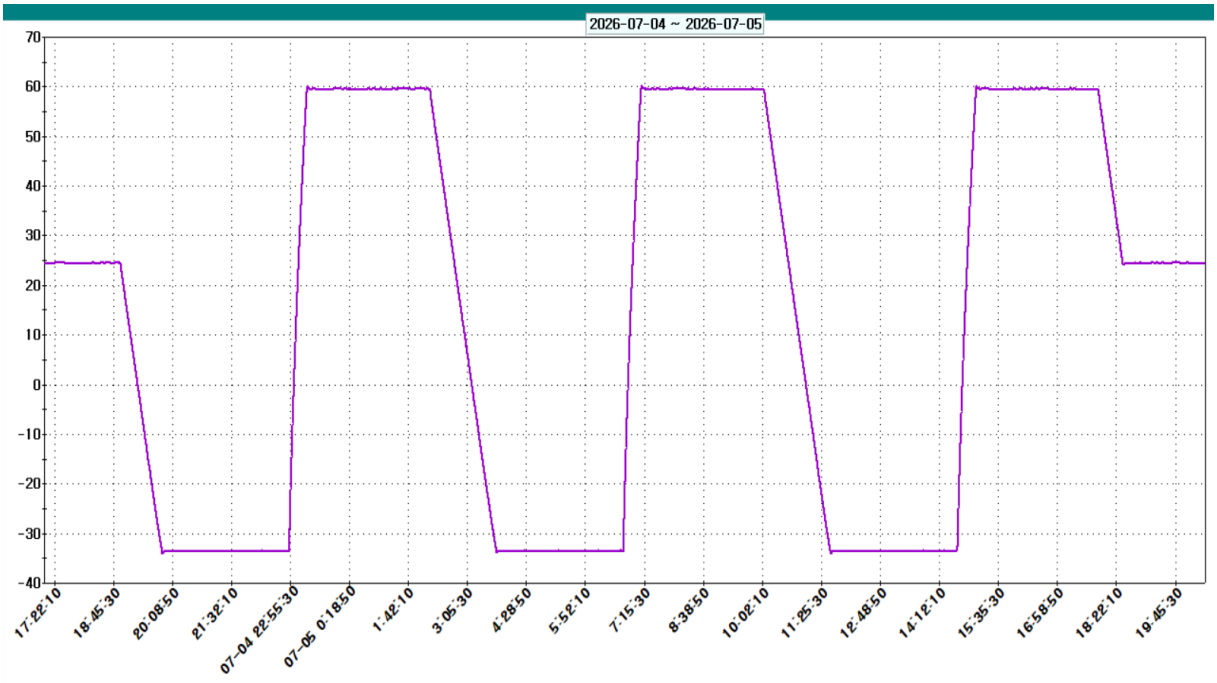
5.4.1 Test results table

Evaluation Criteria	Test Results	Comment
Functional operation	**Pass**	-
Mechanical inspection	**Pass**	-

※ Refer to the sample operation after the completion of testing in section 5.6.

5.5 Test Data

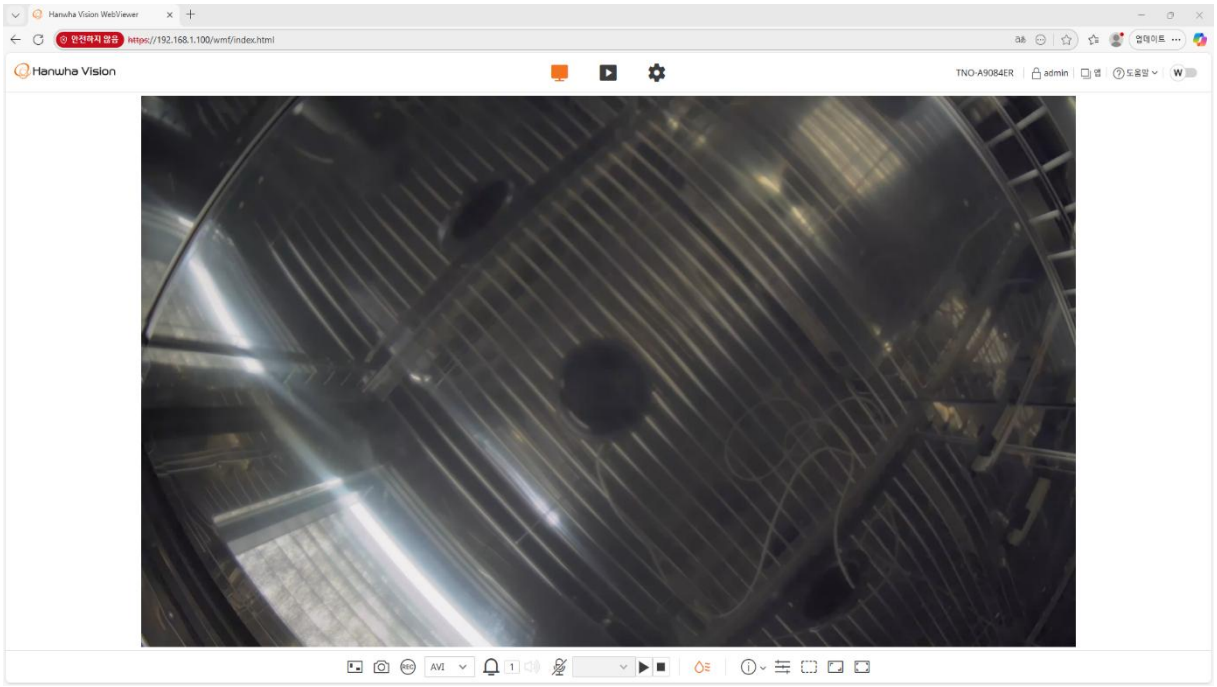
5.5.1 Test data and graph



Temperature Data

5.6 Post-test operation and function

5.6.1 Test sample operation and function



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

6.1 Test date and environmental conditions

6.1.1 Test date: Jul. 03, 2026 ~ Jul. 04, 2026

6.1.2 Measured Environmental Conditions

Item	Temperature (℃)	Humidity (% R.H.)	Pressure (kPa)
Measurement	25.1	55.5	97.4

6.2 Test conditions and methods

6.2.1 Sample status: Operation

6.2.2 Applied waveform: Sine

6.2.3 Frequency (Hz): (5 ~ 200) Hz

6.2.4 Acceleration(G): 1 G

6.2.5 Sweep rate: 1 oct/min

6.2.6 Applicable axis: X, Y, Z

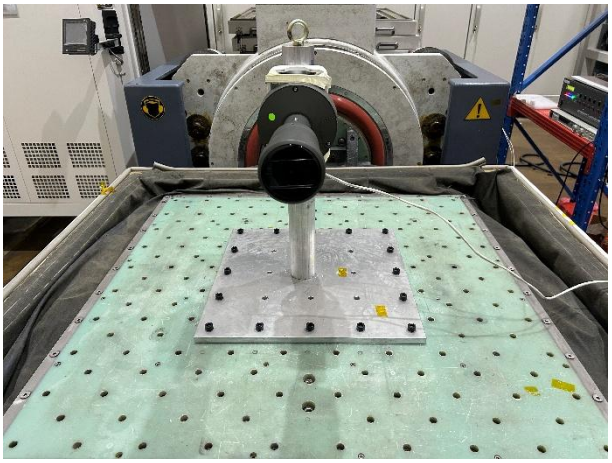
6.2.7 Test time: Total 30 minutes (10 min. per each axis)

6.2.8 Evaluation items

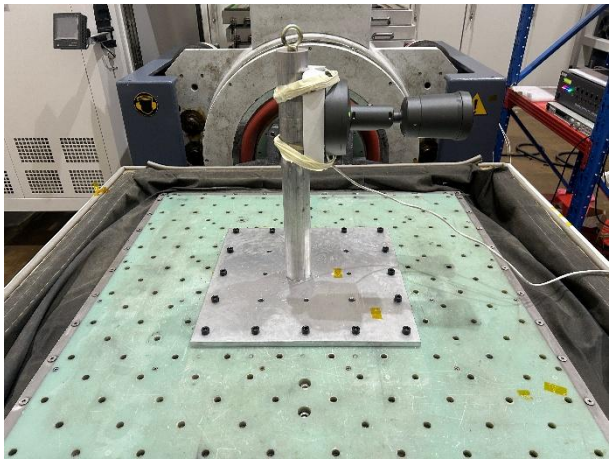
1) The test sample shall be checked to determine that it is functionally operable in all modes of its prescribed operation

6.3 Test Setup and During test sample images

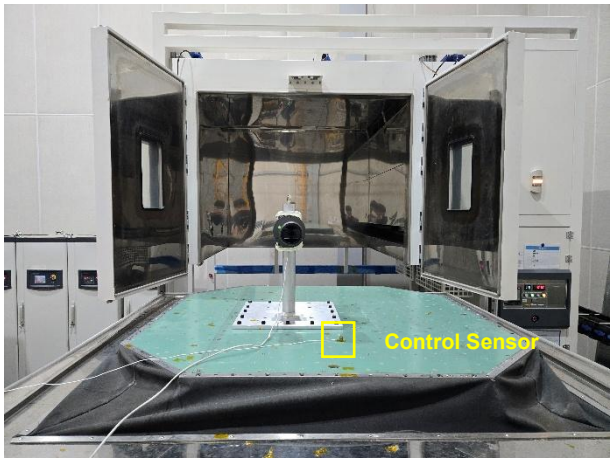
6.3.1 Evidence of test setting



X axis



Y axis



Z axis

※ The control sensors for the X and Y axes are mounted on the vibration plate.

6.4 Test result

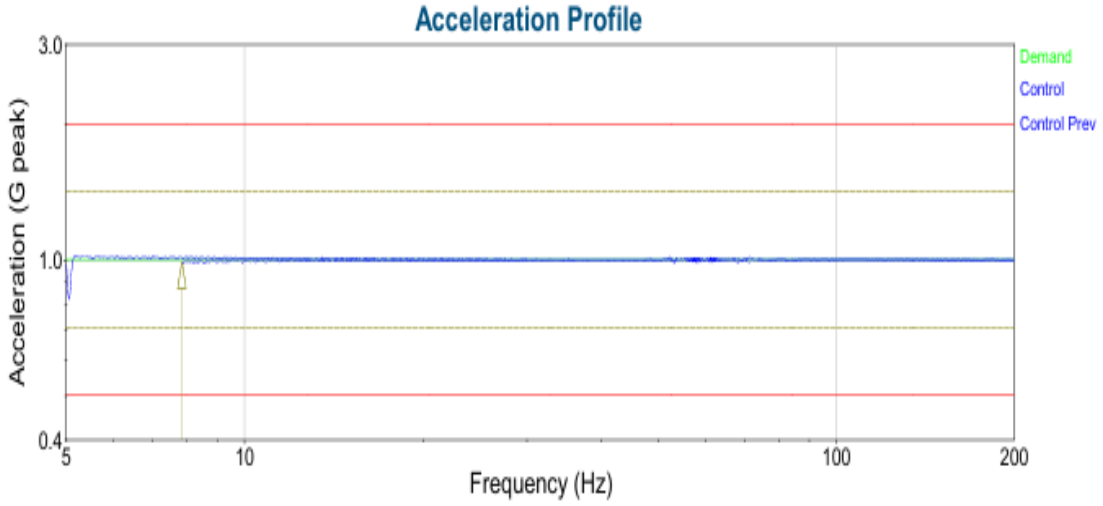
6.4.1 Test results table

Evaluation Criteria	Test Results	Comment
Functional operation	**Pass**	-
Mechanical inspection	**Pass**	-

※ Refer to the sample operation after the completion of testing in section 6.6.

6.5 Test Data

6.5.1 Test Data (X, Y Axis)



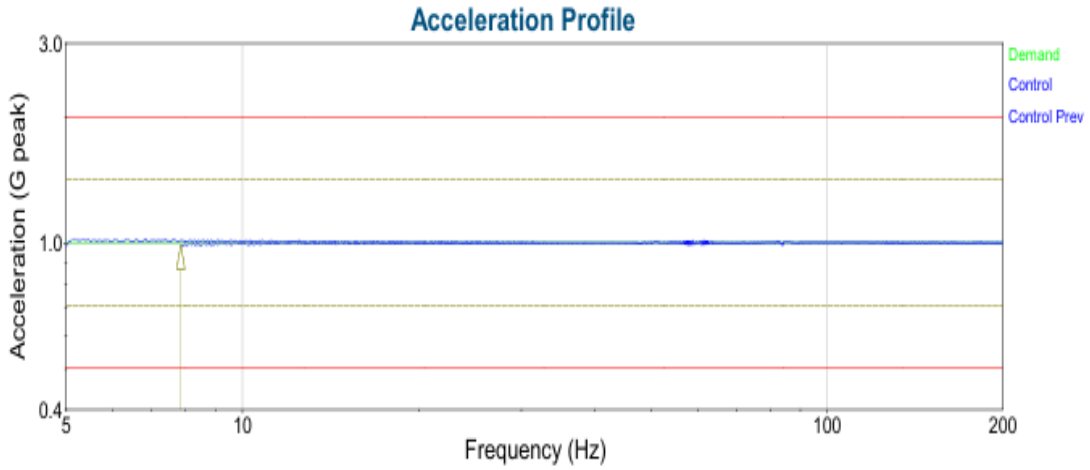
7 03, 2026 15:28:29
Demand: 1 G
Control: 0.9863 G

Level 1) 100 %
Level Time: 0:10:00
Total Time: 0:10:11

Output: 0.2701 Volts peak
Frequency: 7.841 Hz
End of Timed Test

한화비전 60068-2-6

Vibration Test (X Axis)



7 03, 2026 16:59:15
Demand: 1 G
Control: 0.9861 G

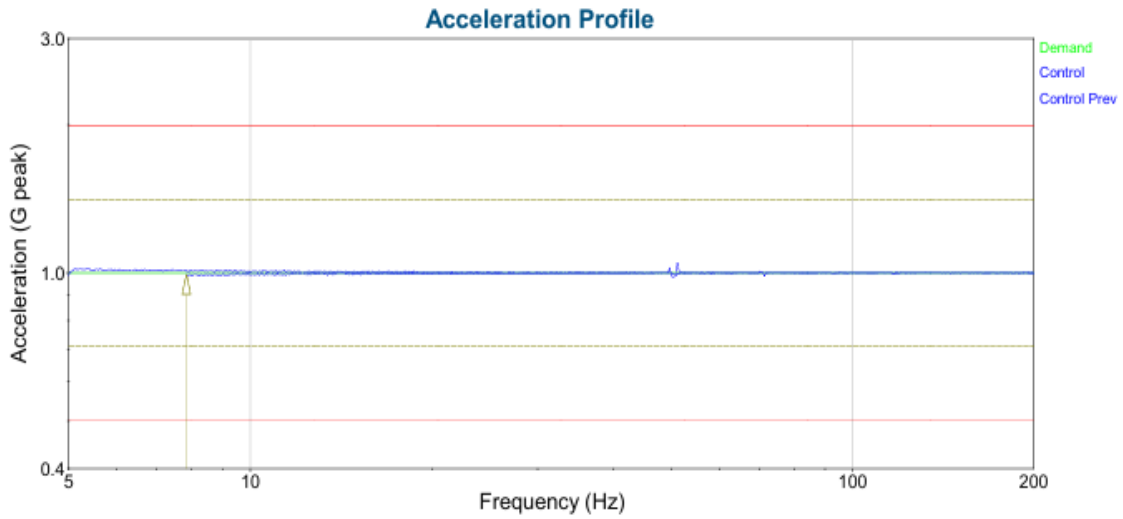
Level 1) 100 %
Level Time: 0:10:00
Total Time: 0:10:13

Output: 0.2691 Volts peak
Frequency: 7.852 Hz
End of Timed Test

한화비전 60068-2-6

Vibration Test (Y Axis)

6.5.2 Test data (Z Axis)

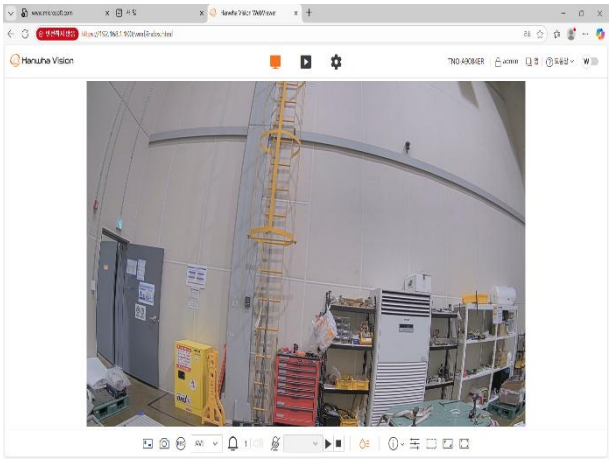


7 04, 2026 08:37:05	Level 1) 100 %	Output: 0.4739 Volts peak	한화비전 60068-2-6
Demand: 1 G	Level Time: 0:10:00	Frequency: 7.846 Hz	
Control: 0.991 G	Total Time: 0:10:13	End of Timed Test	

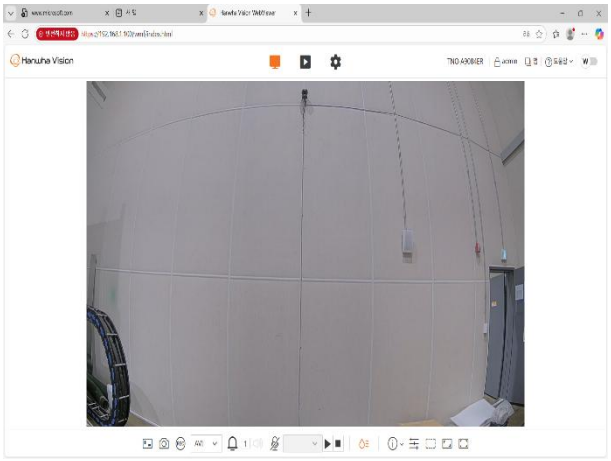
Vibration Test (Z Axis)

6.6 Post-test operation and function

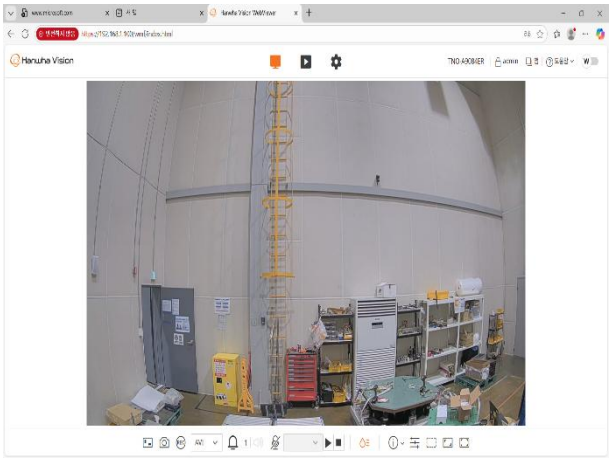
6.6.1 Test sample operation and function



X axis



Y axis



Z axis

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

7.1 Test date and environmental conditions

7.1.1 Test date: Jul. 03, 2026 ~ Jul. 04, 2026

7.1.2 Measured Environmental Conditions

Item	Temperature (℃)	Humidity (% R.H.)	Pressure (kPa)
Measurement	**25.5**	**57.7**	**99.8**

7.2 Test conditions and methods

7.2.1 Sample status: Operation

7.2.2 Acceleration(m/s^2): 100 m/s^2

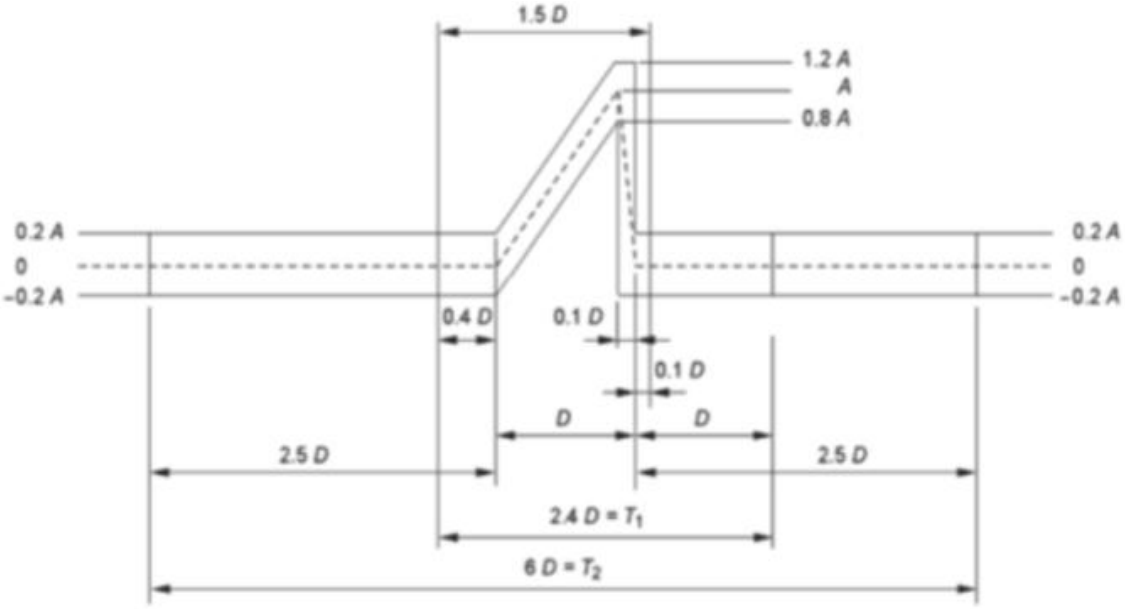
7.2.3 Applicable axis: X, Y, Z

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

7.2.5 Evaluation items

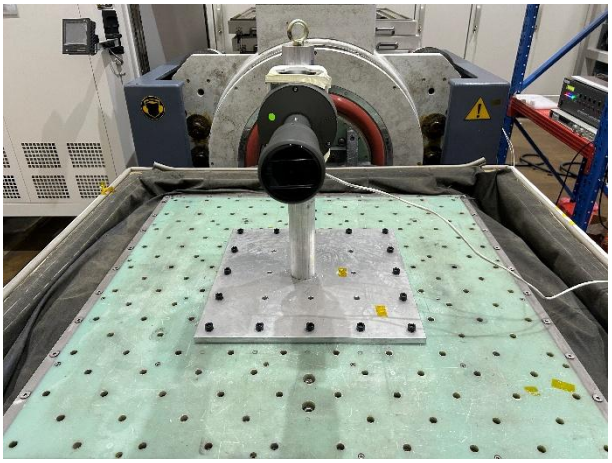
1) The test sample shall be checked to determine that it is functionally operable in all modes of its prescribed operation

7.2.6 Profile

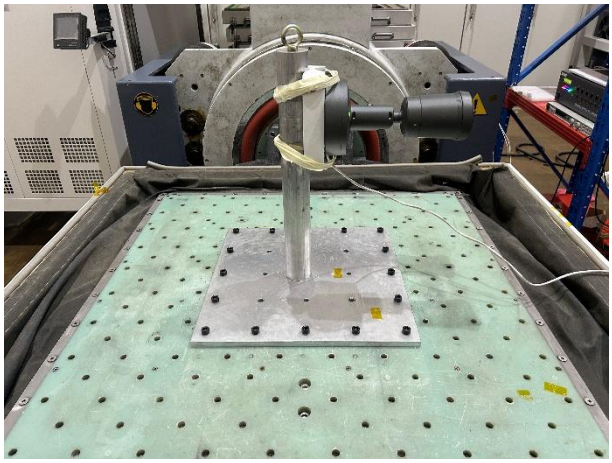


7.3 Test Setup and During test sample images

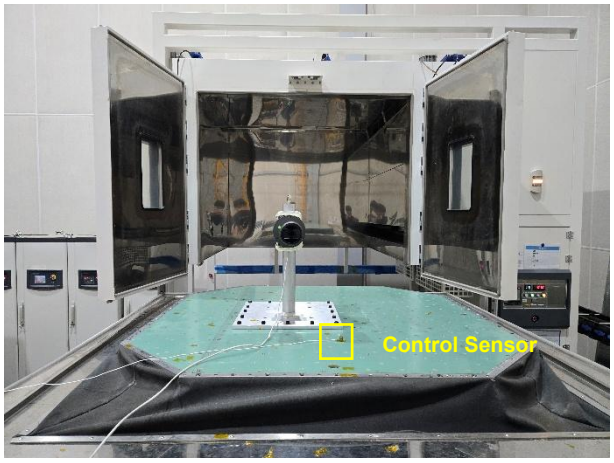
7.3.1 Evidence of test setting



X axis



Y axis



Z axis

※ The control sensors for the X and Y axes are mounted on the vibration plate.

7.4 Test result

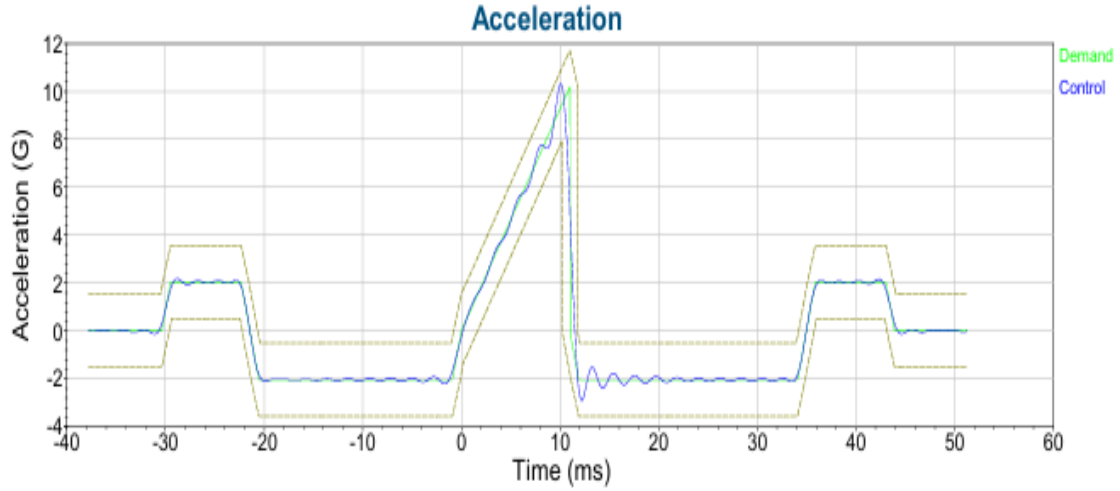
7.4.1 Test results table

Evaluation Criteria	Test Results	Comment
Functional operation	**Pass**	-
Mechanical inspection	**Pass**	-

※ Refer to the sample operation after the completion of testing in section 7.6.

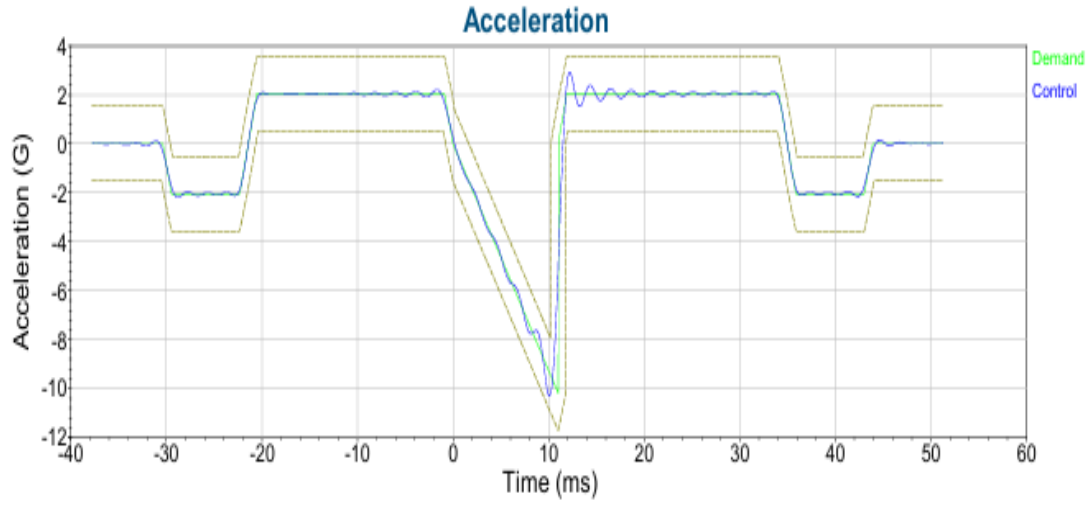
7.5 Test Data

7.5.1 Mechanical shock data (±X Axis)



7 03, 2026 16:46:16 Level 1) 100 % Output: 0.5401 Volts peak 한화비전 60068-2-27
Demand: 10.2 G
Control: 10.3 G Pulse: 10 of 10 Running

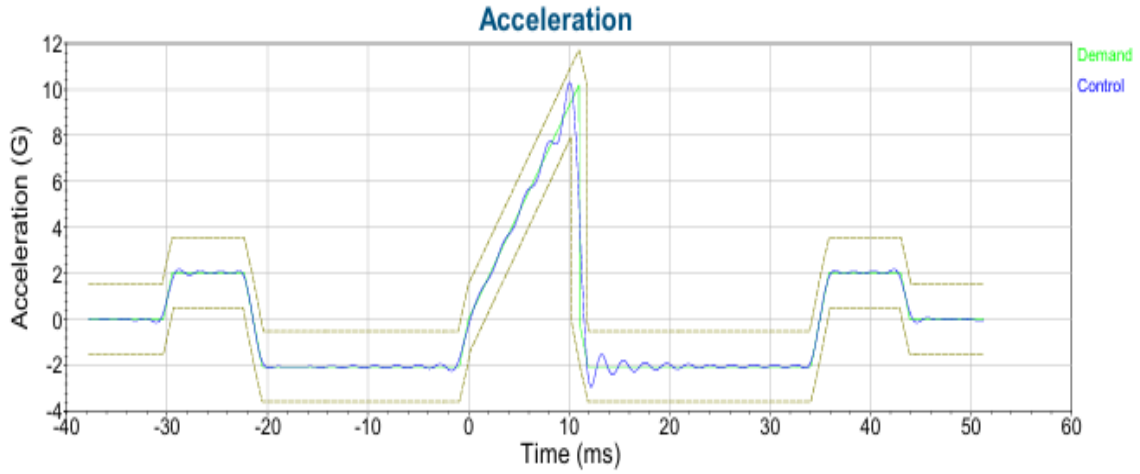
Mechanical Shock data +X Axis



7 03, 2026 16:46:26 Level 2) 100 % Output: 0.5425 Volts peak 한화비전 60068-2-27
Demand: 10.2 G
Control: 10.3 G Pulse: 10 of 10 End of Test

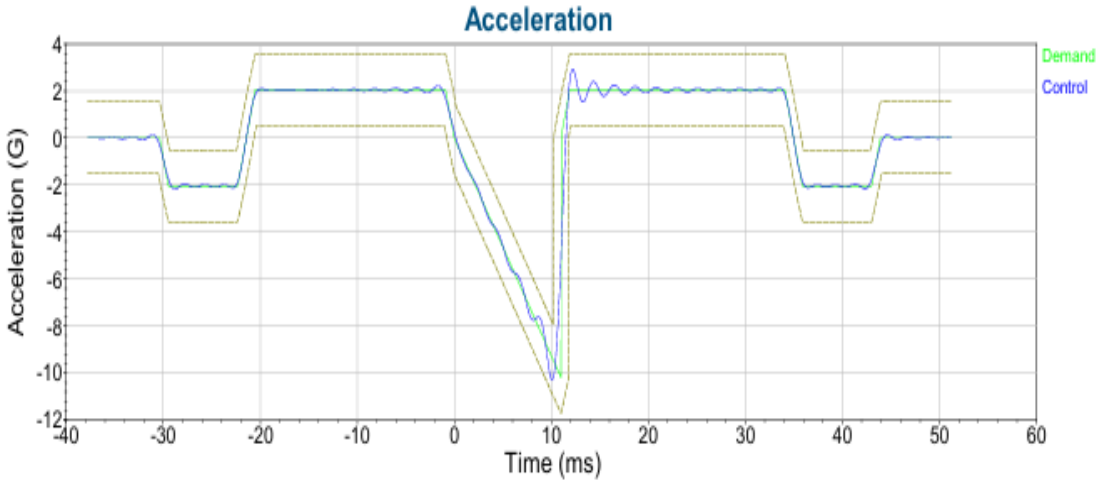
Mechanical Shock data -X Axis

7.5.2 Mechanical shock data (±Y Axis)



7 03, 2026 16:48:32 Level 1) 100 % Output: 0.5396 Volts peak 한화비전 60068-2-27
Demand: 10.2 G
Control: 10.29 G Pulse: 10 of 10 Running

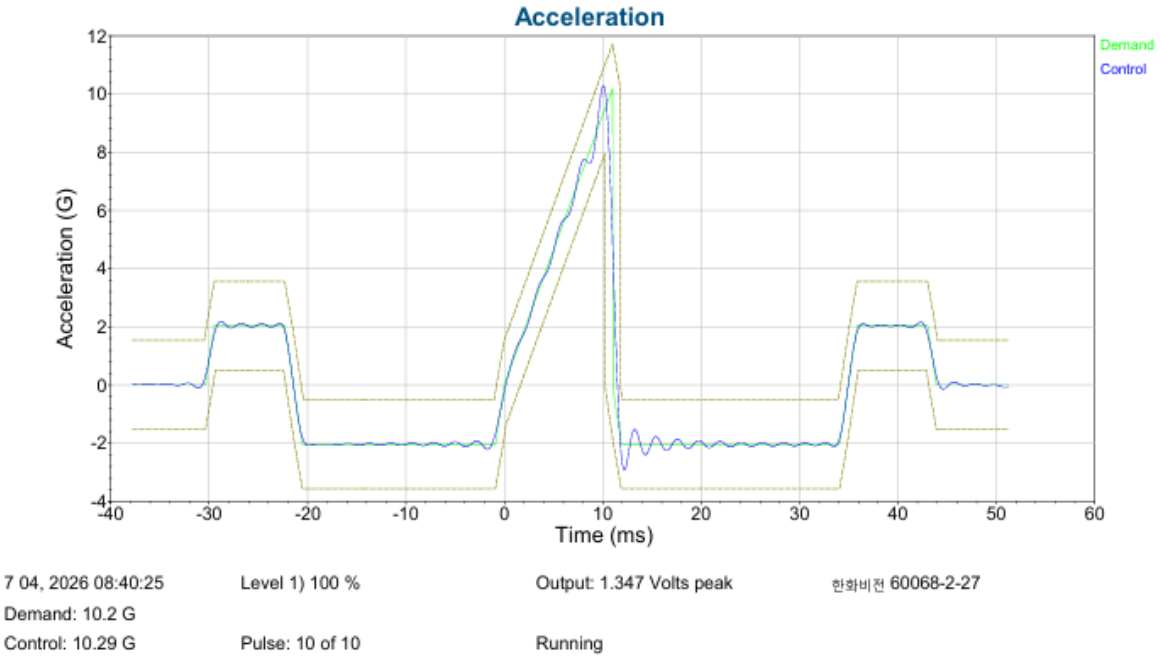
Mechanical Shock data +Y Axis



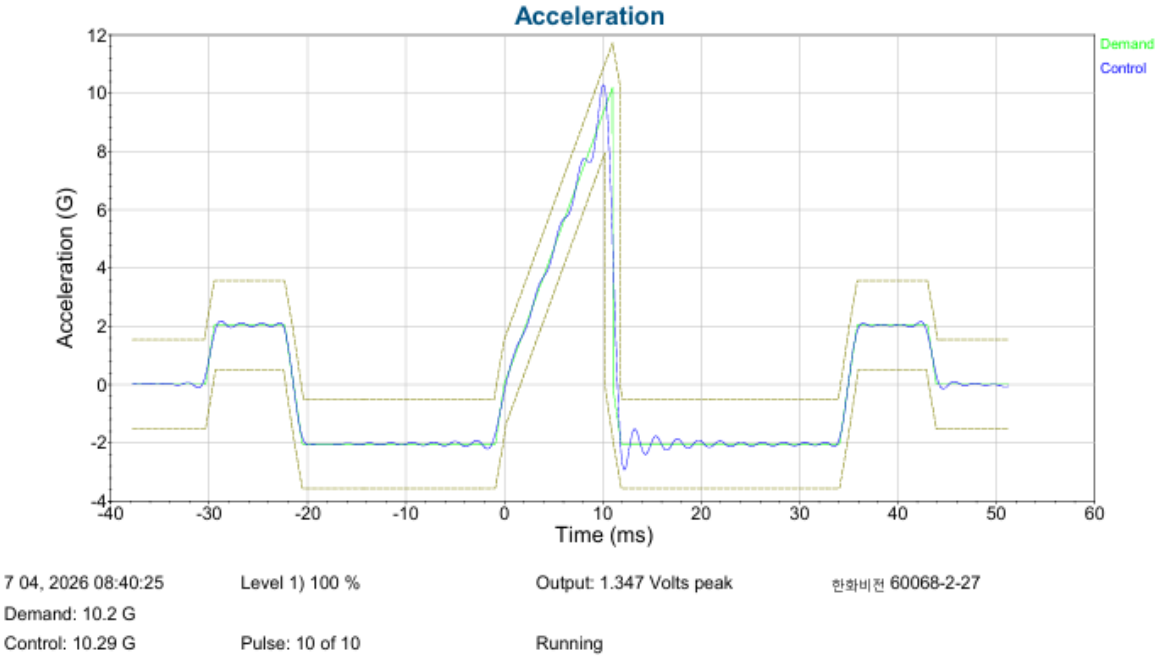
7 03, 2026 16:48:42 Level 2) 100 % Output: 0.5403 Volts peak 한화비전 60068-2-27
Demand: 10.2 G
Control: 10.28 G Pulse: 10 of 10 End of Test

Mechanical Shock data -Y Axis

7.5.3 Mechanical shock data (±Z Axis)



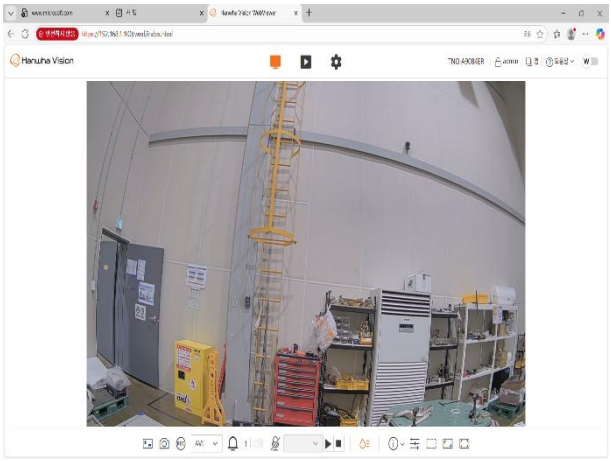
Mechanical Shock data +Z Axis



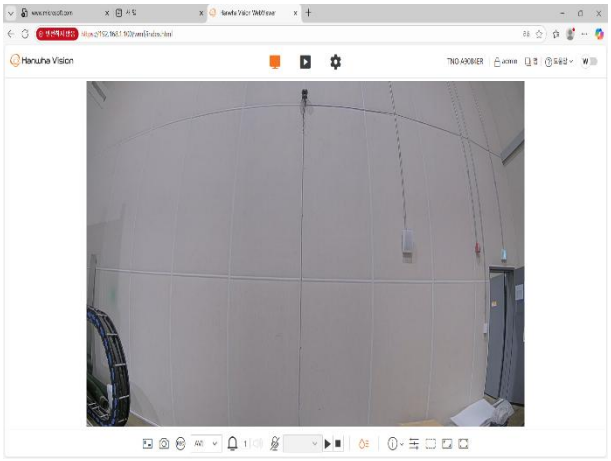
Mechanical Shock data -Z Axis

7.6 Post-test operation and function

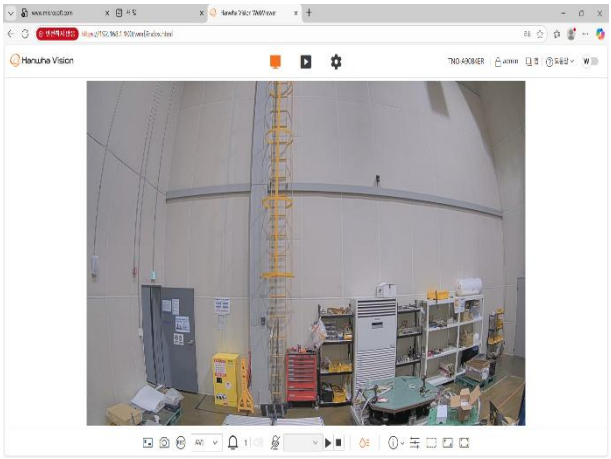
7.6.1 Test sample operation and function



X axis



Y axis



Z axis

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

8.1 Test date and environmental conditions

8.1.1 Test date: Jul. 03, 2026 ~ Jul. 13, 2026

8.1.2 Measured Environmental Conditions

Item	Temperature (℃)	Humidity (% R.H.)	Pressure (kPa)
Measurement	25.5	57.7	99.8

8.2 Test conditions and methods

8.2.1 Preconditioning temperature: 25 °C

8.2.2 Sample status: Operation

8.2.3 Test temperature: 40 °C

8.2.4 Test humidity: 93 % R.H.

8.2.5 Test time: 240 h

8.2.6 Recovery Temperature: 25 °C

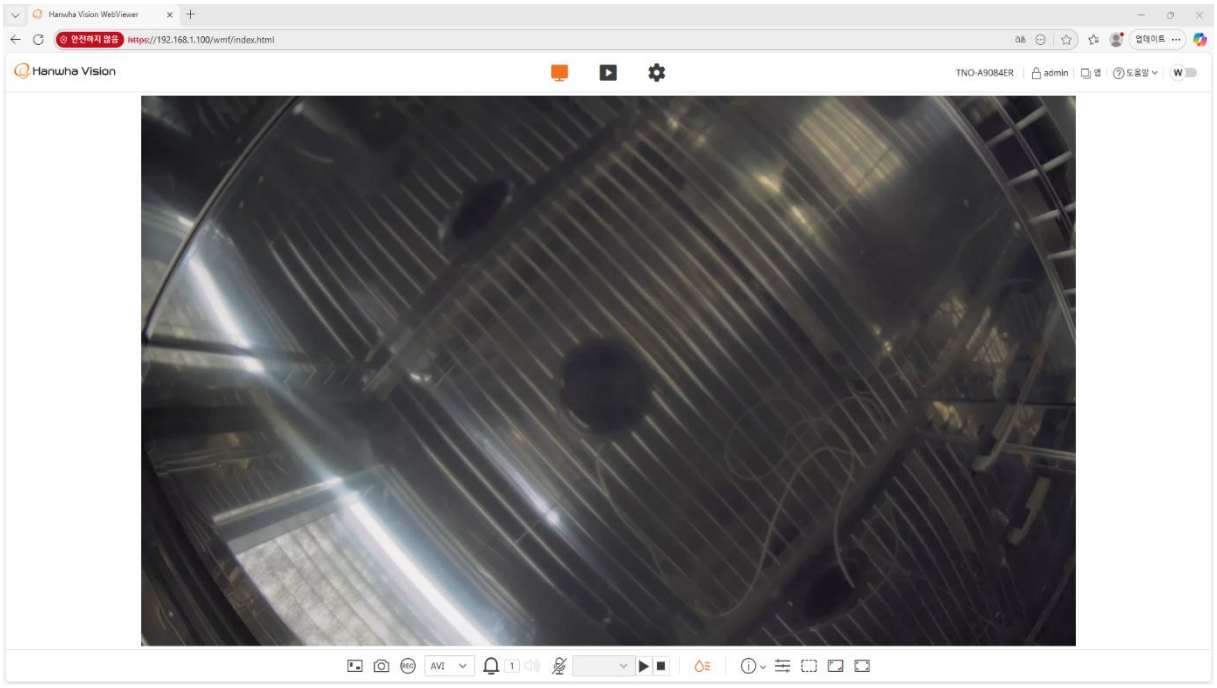
8.2.7 Evaluation items

1) The test sample shall be checked to determine that it is functionally operable in all modes of its prescribed operation

8.3 Test Setup and During test sample images

8.3.1 Evidence of test setting





8.4 Test result

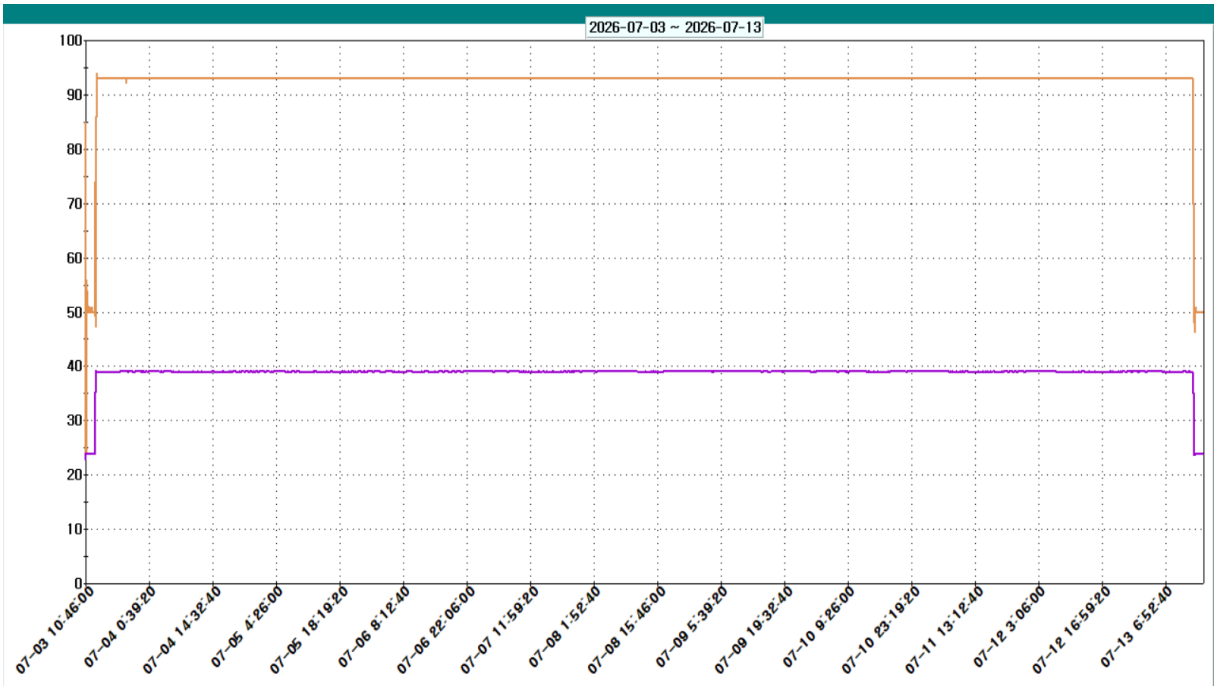
8.4.1 Test results table

Evaluation Criteria	Test Results	Comment
Functional operation	**Pass**	-
Mechanical inspection	**Pass**	-

※ Refer to the sample operation after the completion of testing in section 8.6.

8.5 Test Data

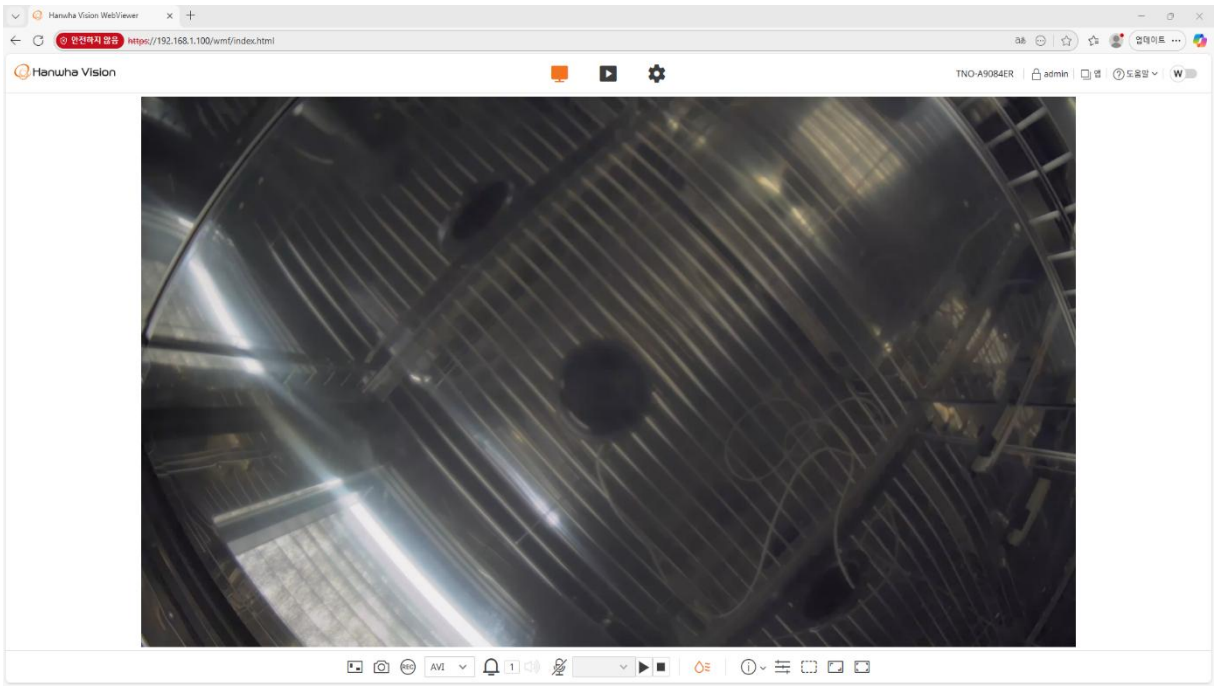
8.5.1 Test data and graph



Temperature Data

8.6 Post-test operation and function

8.6.1 Test sample operation and function



8.7 Post-test sample images

8.7.1 Test sample



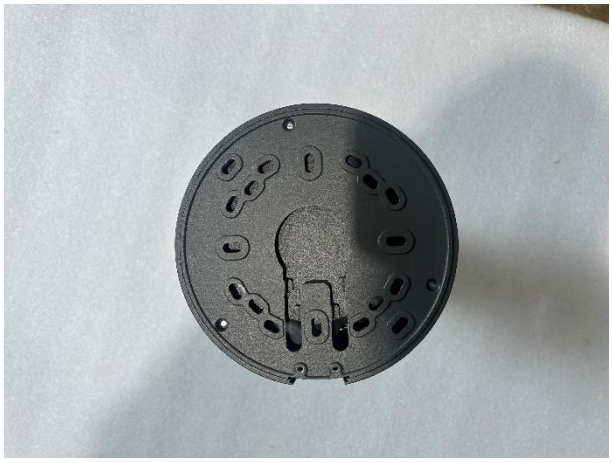
Top



Bottom



Front



Rear



Left side



Right side

- End -