TEST REPORT

1.	**Report Number**	KR16-YYP0045
2.	**Applicant**	
	○ Name	Hanwha Techwin Co., Ltd
	○ Address	1204, Changwon-daero, Seongsan-gu, Changwon-si, Gyeongsangnam-do, Korea
	○ Date of Receipt	June 15, 2016
3.	**Manufacturer**	
	○ Name	Hanwha Techwin Co., Ltd
	○ Address	1204, Changwon-daero, Seongsan-gu, Changwon-si, Gyeongsangnam-do, Korea
4.	**Use of Report**	For Quality management
5.	**Test item description**	
	○ Product Name	Network Camera
	○ Model Name	PNF-9010RV* (*N: NTSC / P: PAL)
6.	**Test method used**	
7.	**Date of Test**	July 4, 2016 ~ August 24, 2016
8.	**Environment**	
	○ Temperature	(15~35) °C
	○ Relative Humidity	(25~75) % R.H
	○ Air pressure	(86~106) kPa
9.	**Test Results**	No abnormal was found

※ This test results apply only to the test sample supplied by applicant and do not guarantee the whole product quality. This test report shall not be reproduced except in full, without the written approval by the KCTL Inc.

Affirmation	Tested by Name : Young min, Jang (Signature)	Technical Manager Name : Do hong, Choi (Signature)

August. 29. 2016

KCTL INC.

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1. Test Laboratory

1.1 General

Name of Test Laboratory	KCTL INC.
Address	52-20, Sinjeong-ro 41 beon-gil, Giheung-gu, Yongin-si, Gyeonggi-do 446-599, Korea
TEL	82 31-326-6700
FAX	82 505-299-8311
Home page	www.kctl.co.kr

1.2 Certificate of Designated Testing Laboratory

Mark.	Registration No.
NRRA	KR0040
KOLAS	No. KT231
IEC(CB-Scheme)	TL512
TUV-SUD	CARAT 15 08 93040 001
VCCI Council	R-3327, C-3706, T-1849, G-198
DSP Research, Inc.	G039
FCC	Test Firm Registration No. 687132
INDUSTRY CANADA	Company Address Code: 8035A

2. Test equipment

2.1 Specification

Division	Specification
Product Name	Network Camera
Model Name	PNF-9010RV* (*N: NTSC / P: PAL)
Etc.	-

- Basic model: PNF-9010RV*
- Serise model: PNF-9010R*, PNF-9010RVM*
- The basic model and series models are identical Hardware
- The model PNF-9010RV* was conducted tests representatively.

2.2 Product Photograph

[Sample

3. Test Summary

Test Method	Test Item	Test Result
EN 50155: 2007	Simulated long life test	No abnormal was found
	Shock test	No abnormal was found
	Functional random test	No abnormal was found
	Cooling test	No abnormal was found
	Dry heat test (T2)	No abnormal was found
	Dry heat test (TX)	No abnormal was found
IEC 60529: 2006	IP6X	No abnormal was found
	IP6X	No water penetration was found
	IPX6	No dust penetration was found
IEC 62262: 2005	IK10	No abnormal was found

4. Test Method and Result

4.1 Simulated long life test

4.1.1 Test Equipment

Description	Model	Manufacturer	Serial Number	Due Cal
Vibration	F-51000BDH / SLS60	EMIC / JAPAN	37921	2017. 05. 10
Accelerometer	731-B	EMIC / JAPAN	4378	2017. 04. 01
Accelerometer	731-B	EMIC / JAPAN	4591	2017. 04. 01

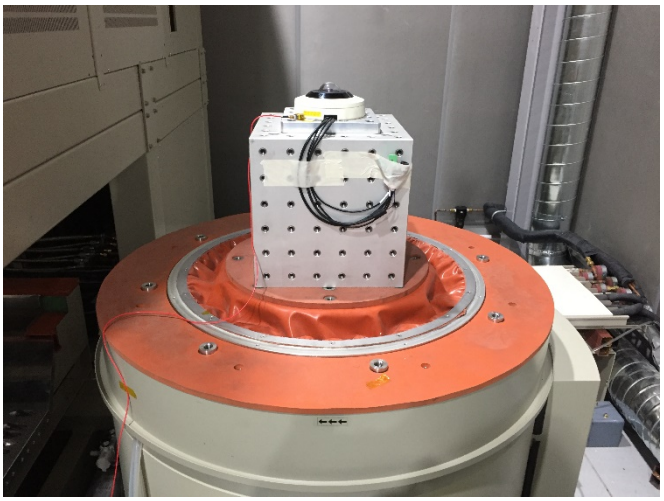
4.1.2 Test Condition

Test standard	EN 50155: 2007(Section 12.2.11) / EN 61373: 2010(Category 1 Class A)		
Test type	Random		
Frequency	(5 ~ 150) Hz		
Acceleration	Vertical (X)	Transverse (X)	Longitudinal (Y)
	4.25 m/s^2 r.m.s	2.09 m/s^2 r.m.s	2.83 m/s^2 r.m.s
Test time	X, Y, Z (5 h in each axis), Total 15 h		
Sample quantity	1 ea		
Sample condition	Unpackaged Product / Non-operation		
Check time	Before the test, After the test		

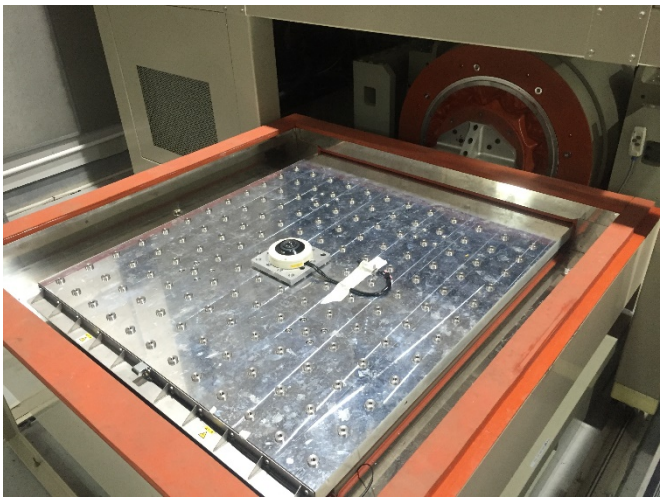
4.1.3 Test Result

Check list	Test Result
Mechanical damage such as deformation, crack, separating, loosening of screw	No abnormal was found
video output (Before the test, After the test)	Refer to 4.1.6

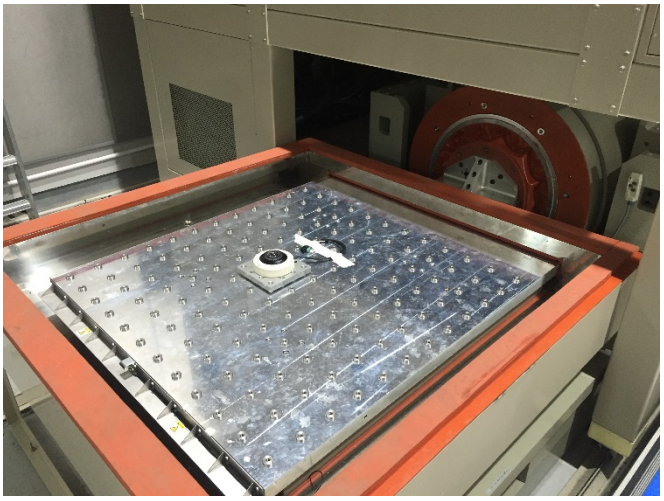
4.1.4 Test Photograph



[Vertical (Z)]

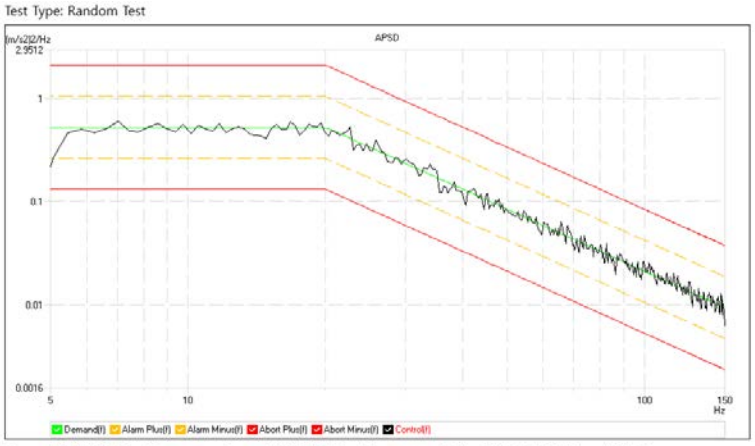


[Transverse (X)]



[Longitudinal (Y)]

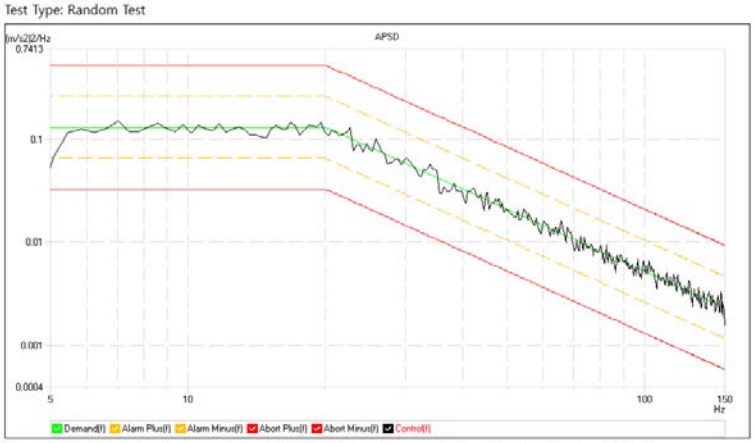
4.1.5 Vibration Graph



Demand RMS: 4.156 m/s2 Control RMS: 4.092 m/s2 Drive RMS: 0.0227 V Level: 100 %

Test Time: 05:00:20 Remaining Time: 00:00:00 Total Time: 05:01:39

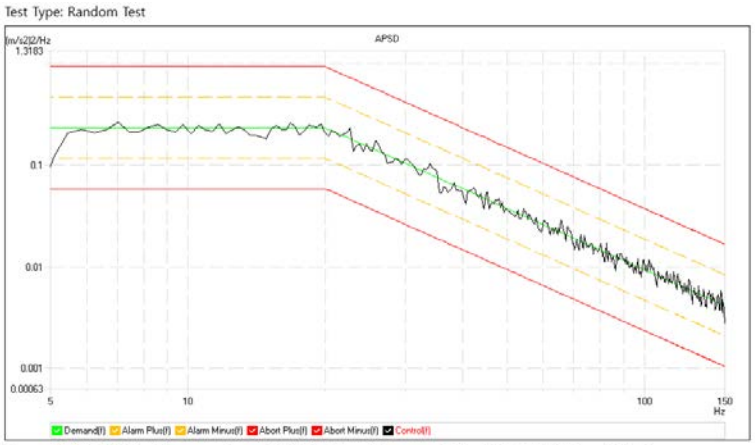
[Vertical (Z)]



Demand RMS: 2.0623 m/s2 Control RMS: 2.0273 m/s2 Drive RMS: 0.0124 V Level: 100 %

Test Time: 05:00:20 Remaining Time: 00:00:00 Total Time: 05:01:39

[Transverse (X)]

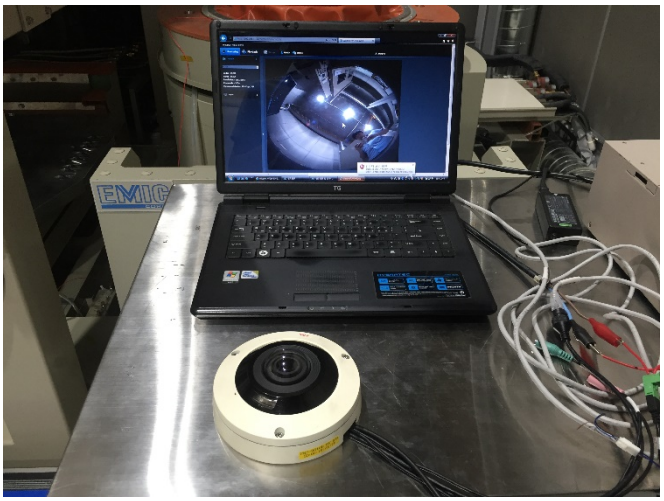


Demand RMS: 2.7563 m/s2 Control RMS: 2.7111 m/s2 Drive RMS: 0.0164 V Level: 100 %

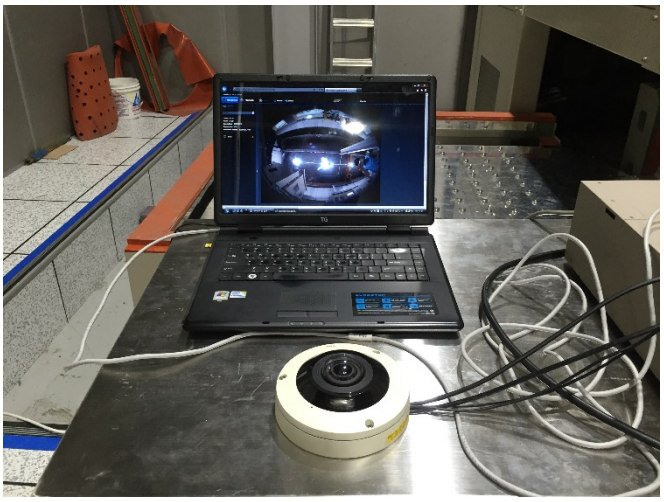
Test Time: 05:00:20 Remaining Time: 00:00:00 Total Time: 05:01:39

[Longitudinal (Y)]

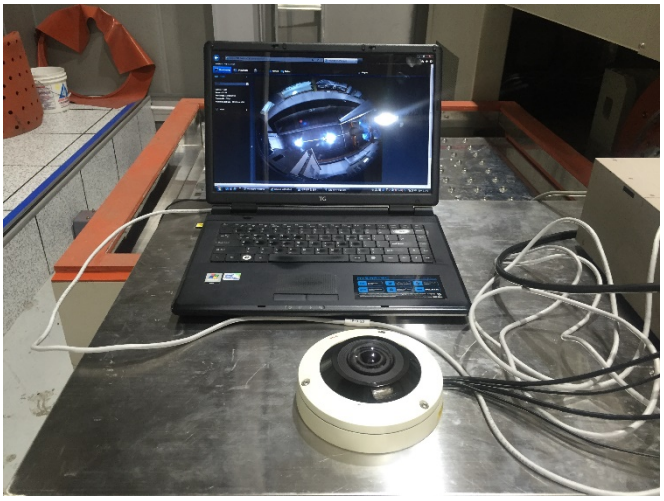
4.1.6 Video output



[After the test, Vertical (Z)]



[After the test, Transverse (X)]



[After the test, Longitudinal (Y)]

4.2 Shock test

4.2.1 Test Equipment

Description	Model	Manufacturer	Serial Number	Due Cal
Vibration	F-51000BDH / SLS60	EMIC / JAPAN	37921	2017. 05. 10
Accelerometer	731-B	EMIC / JAPAN	4378	2017. 04. 01

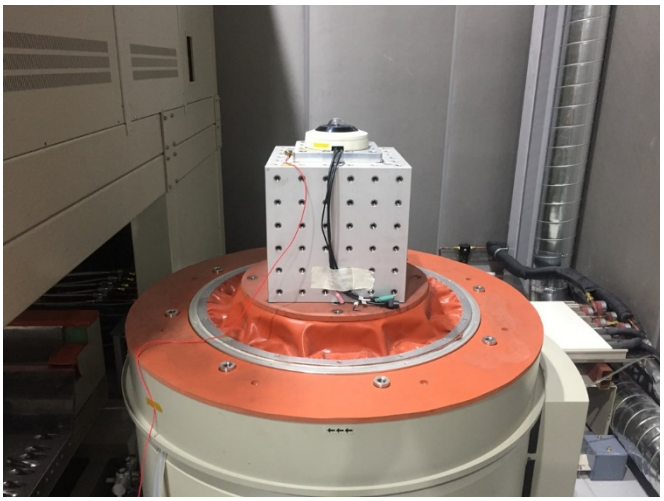
4.2.2 Test Condition

Test standard	EN 50155: 2007(Section 12.2.11) / EN 61373: 2010(Category 1 Class A)		
Test type	Half sine		
Acceleration	Vertical (X)	Transverse (X)	Longitudinal (Y)
	30 m/s^2	30 m/s^2	50 m/s^2
Duration	30 ms		
Test axis	Vertical (Z), Transverse (X), Longitudinal (Y)		
Test time	18 times in total (6 times in each axis: positive 3 / negative 3)		
Sample quantity	1 ea		
Sample condition	Unpackaged product / Non-operation		
Check time	Before the test, After the test		

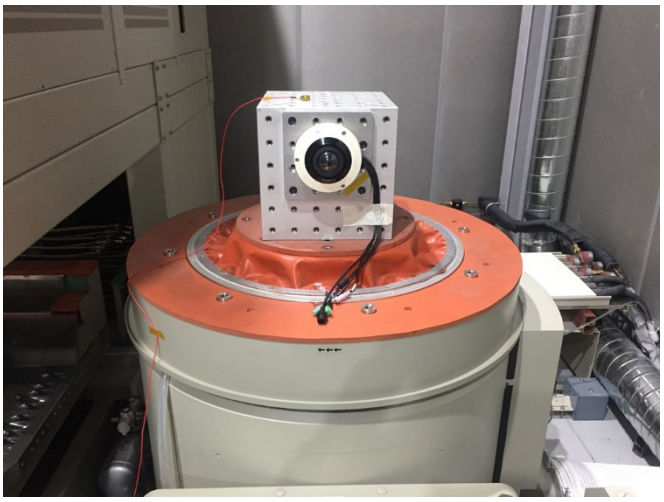
4.2.3 Test Result

Check list	Test Result
Mechanical damage such as deformation, crack, separating, loosening of screw	No abnormal was found
Video output (Before the test, After the test)	Refer to 4.2.6

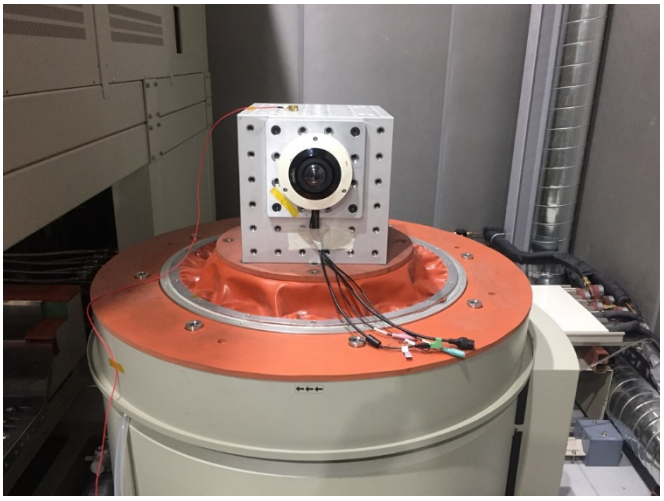
4.2.4 Test Photograph



[Vertical (Z)]



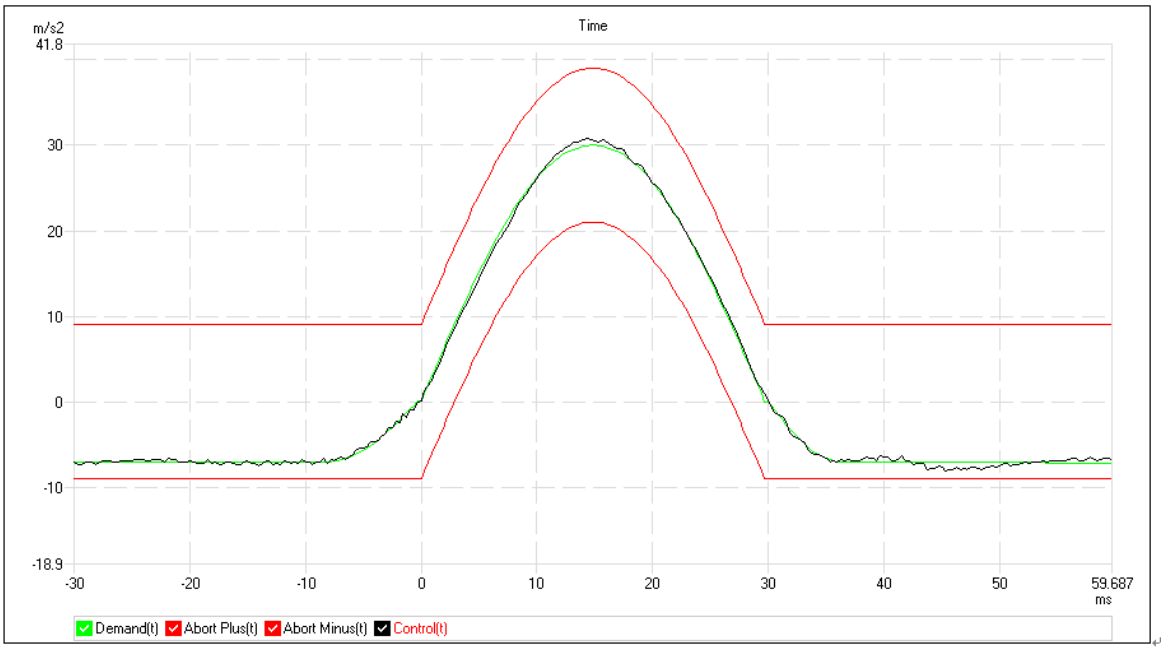
[Transverse (X)]



[Longitudinal (Y)]

4.2.5 Shock Graph

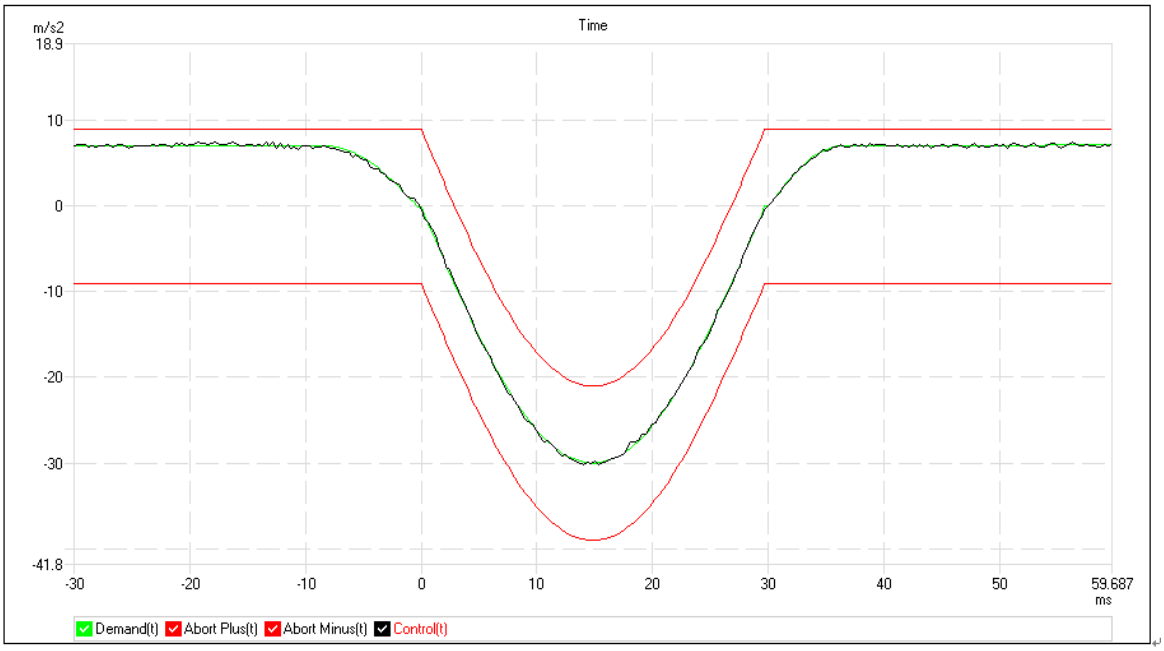
Test Type: Shock Test



Demand Peak: 30 m/s2 Control Peak: 30.777 m/s2 Drive Peak: 0.1482 V Level: 100 %

Test Pulses: 13 Remain Pulses: 0 Pulse Wave Type: Half Sine Amplitude: 30 m/s2 Pulse Duration: 30 ms

Test Type: Shock Test

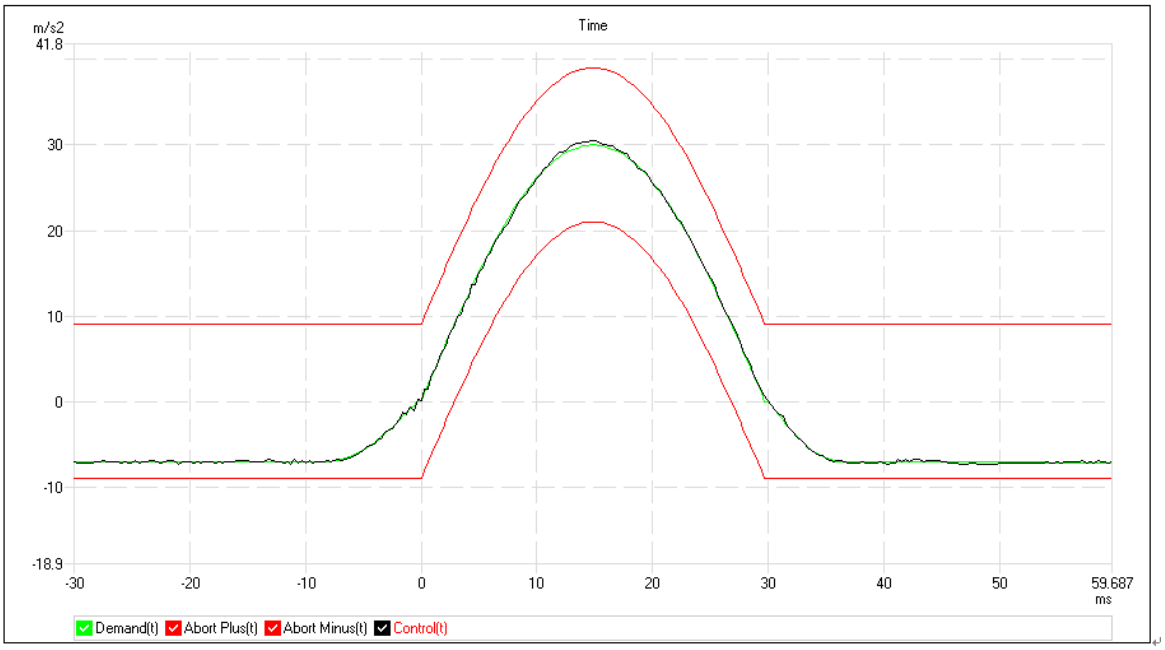


Demand Peak: 30 m/s2 Control Peak: 30.127 m/s2 Drive Peak: 0.1473 V Level: 100 %

Test Pulses: 13 Remain Pulses: 0 Pulse Wave Type: Half Sine Amplitude: 30 m/s2 Pulse Duration: 30 ms

[Vertical (Z)]

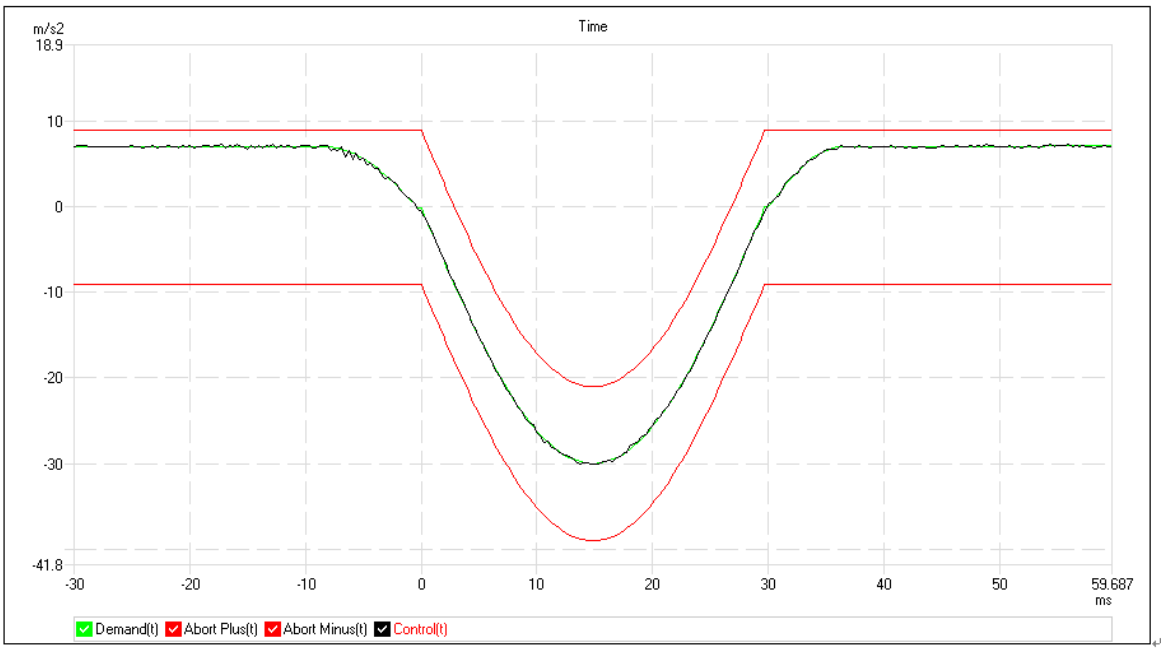
Test Type: Shock Test



Demand Peak: 30 m/s2 Control Peak: 30.503 m/s2 Drive Peak: 0.1483 V Level: 100 %

Test Pulses: 13 Remain Pulses: 0 Pulse Wave Type: Half Sine Amplitude: 30 m/s2 Pulse Duration: 30 ms

Test Type: Shock Test

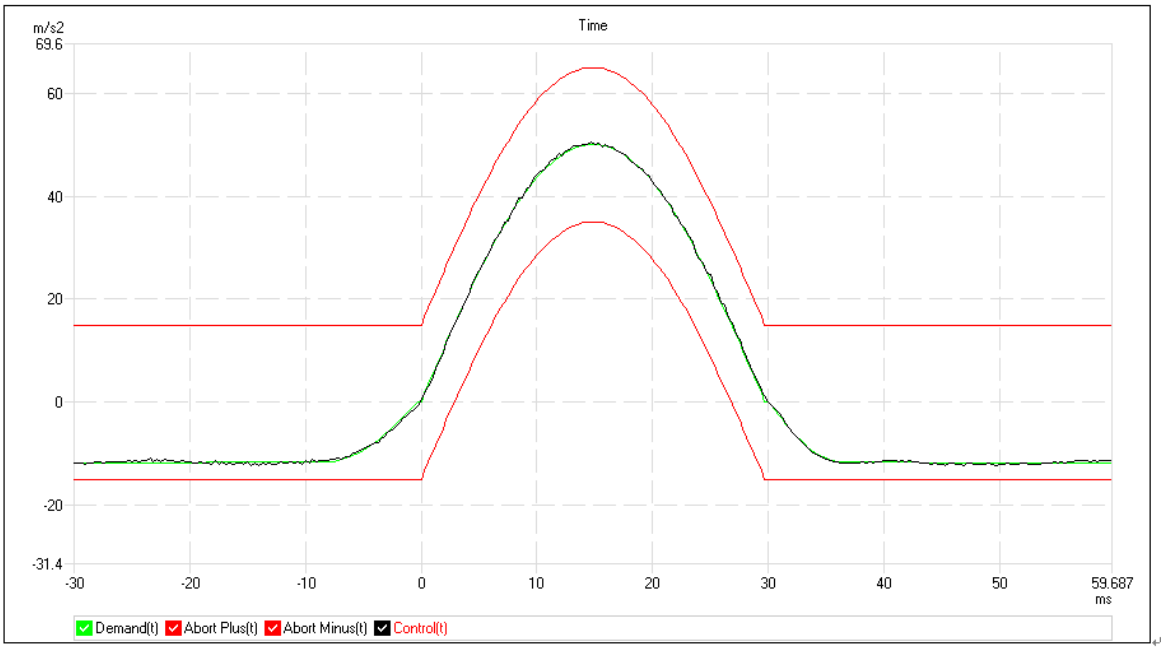


Demand Peak: 30 m/s2 Control Peak: 30.037 m/s2 Drive Peak: 0.1483 V Level: 100 %

Test Pulses: 13 Remain Pulses: 0 Pulse Wave Type: Half Sine Amplitude: 30 m/s2 Pulse Duration: 30 ms

[Transverse (X)]

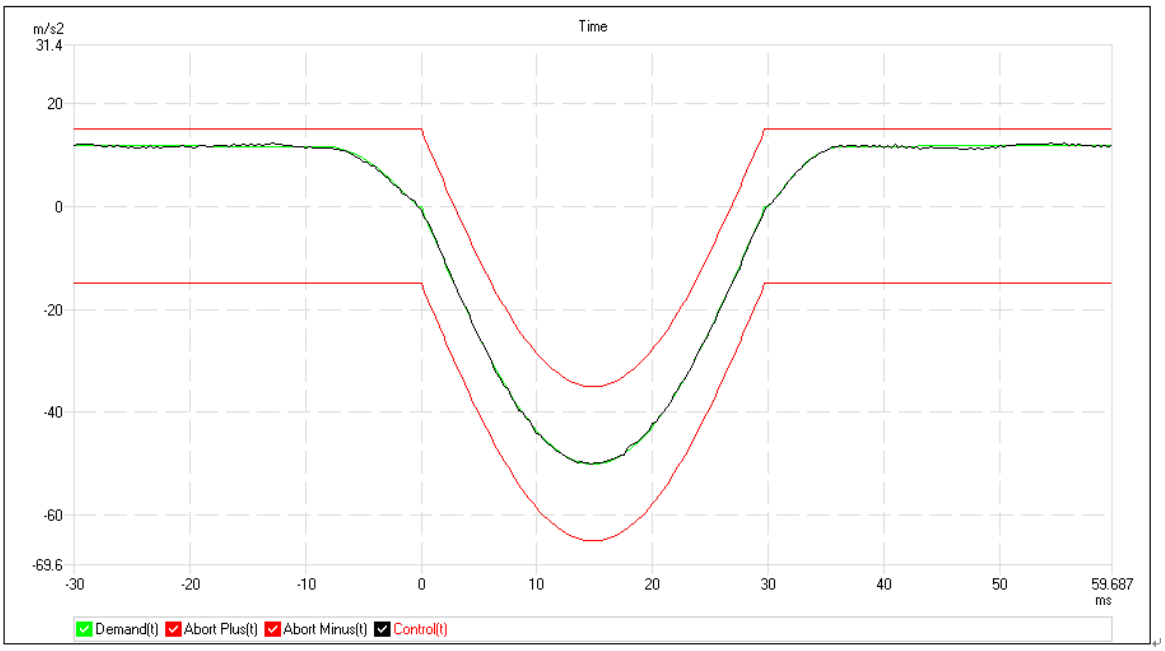
Test Type: Shock Test



Demand Peak: 50 m/s2 Control Peak: 50.561 m/s2 Drive Peak: 0.246 V Level: 100 %

Test Pulses: 13 Remain Pulses: 0 Pulse Wave Type: Half Sine Amplitude: 50 m/s2 Pulse Duration: 30 ms

Test Type: Shock Test

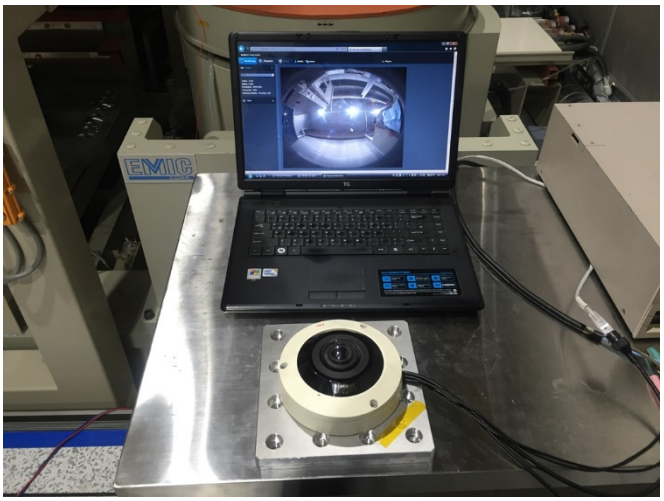


Demand Peak: 50 m/s2 Control Peak: 49.941 m/s2 Drive Peak: 0.2472 V Level: 100 %

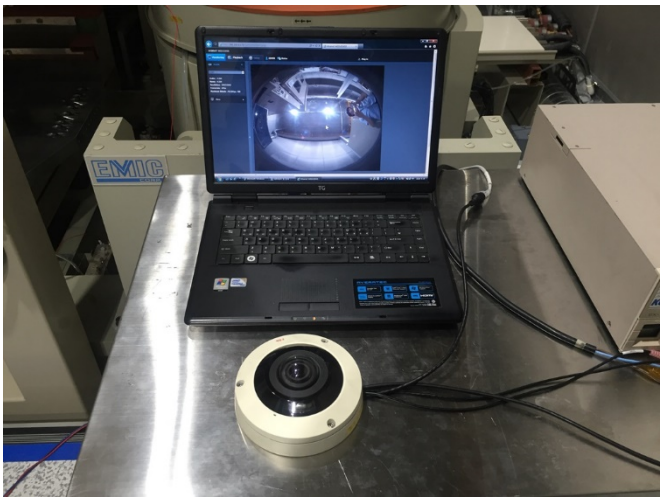
Test Pulses: 13 Remain Pulses: 0 Pulse Wave Type: Half Sine Amplitude: 50 m/s2 Pulse Duration: 30 ms

[Longitudinal (Y)]

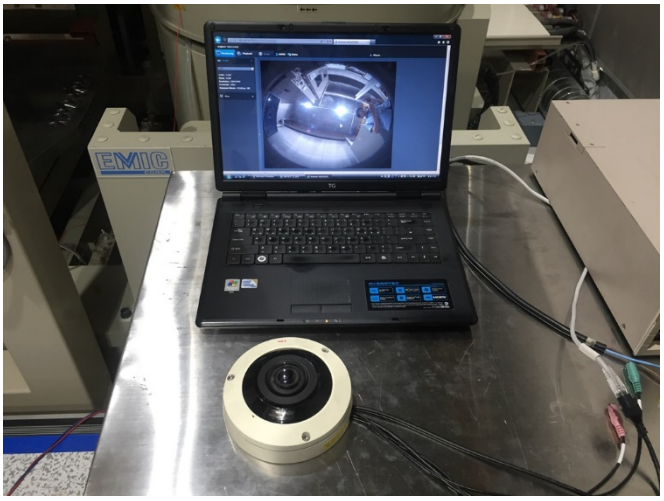
4.2.6 Video output



[After the test, Vertical (Z)]



[After the test, Transverse (X)]



[After the test, Longitudinal (Y)]

4.3 Functional random test

4.3.1 Test Equipment

Description	Model	Manufacturer	Serial Number	Due Cal
Vibration	F-51000BDH / SLS60	EMIC / JAPAN	37921	2017. 05. 10
Accelerometer	731-B	EMIC / JAPAN	4378	2017. 04. 01

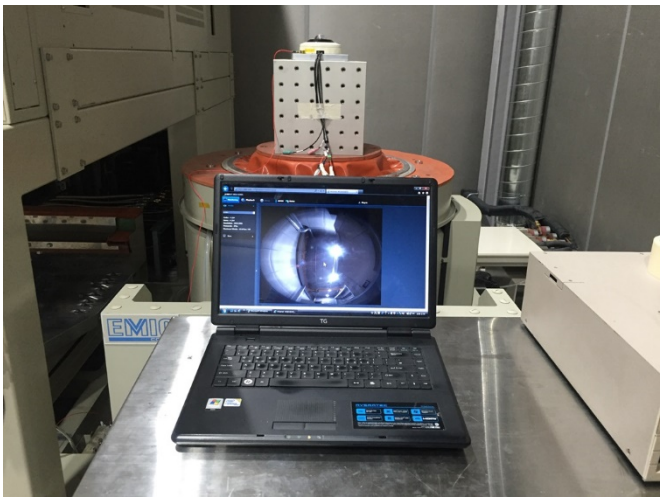
4.3.2 Test Condition

Test standard	EN 50155: 2007(Section 12.2.11) / EN 61373: 2010(Category 1 Class A)		
Test Type	Random		
Frequency	(5 ~ 150) Hz		
Acceleration	Vertical (X)	Transverse (X)	Longitudinal (Y)
	0.75 m/s^2 r.m.s	0.37 m/s^2 r.m.s	0.5 m/s^2 r.m.s
Test time	X, Y, Z (10 min in each axis), Total 30 min		
Sample quantity	1 ea		
Sample condition	Unpackaged product / Operation		
Check time	Before the test, During the test, After the test		

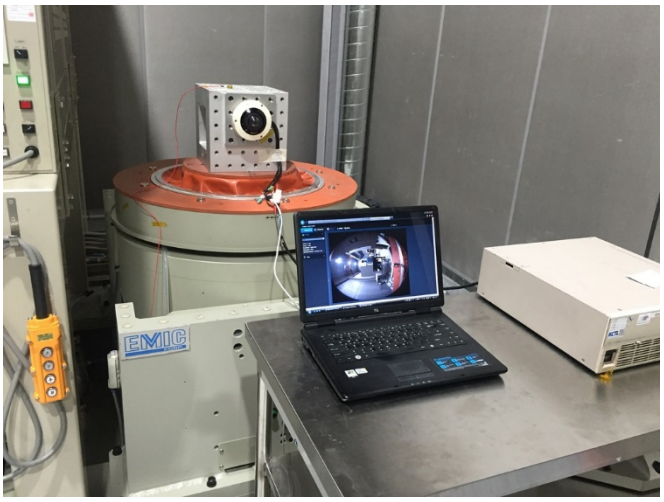
4.3.3 Test Result

Check list	Test Result
Mechanical damage such as deformation, crack, separating, loosening of screw	No abnormal was found
Video output (Before the test, During the test, After the test)	Refer to 4.3.6

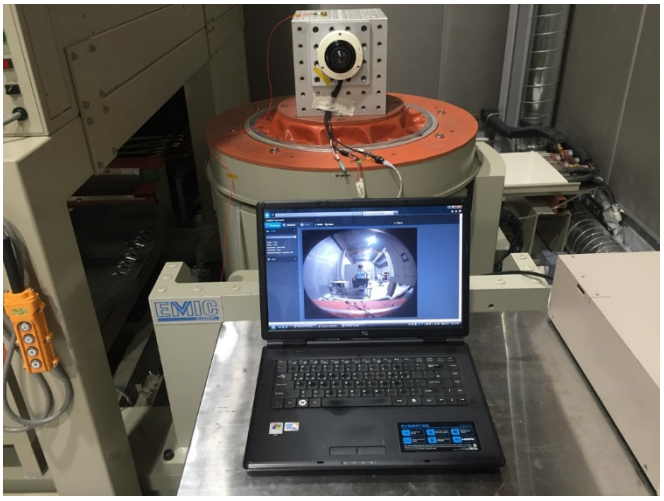
4.3.4 Test Photograph



[During the test, Vertical (Z)]

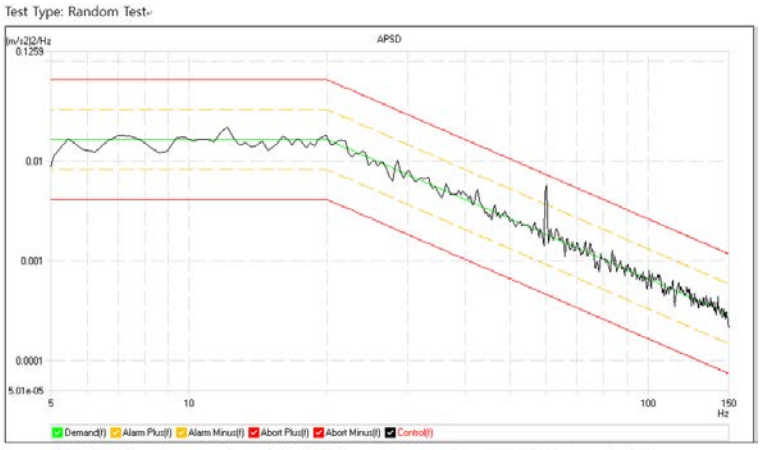


[During the test, Transverse (X)]

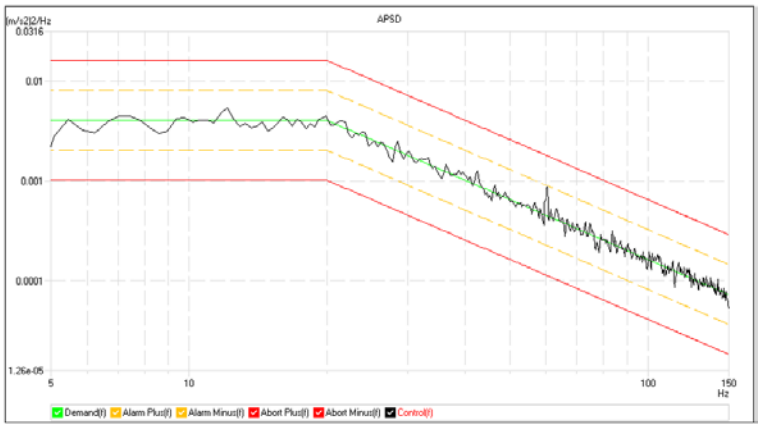


[During the test, Longitudinal (Y)]

4.3.5 Vibration Graph



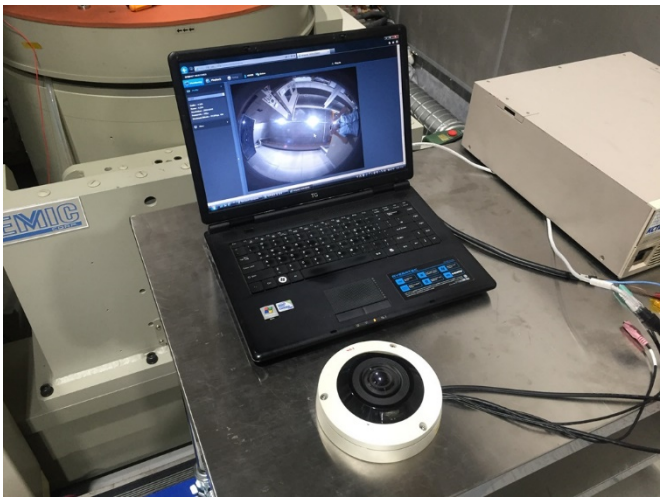
[Vertical (Z)]



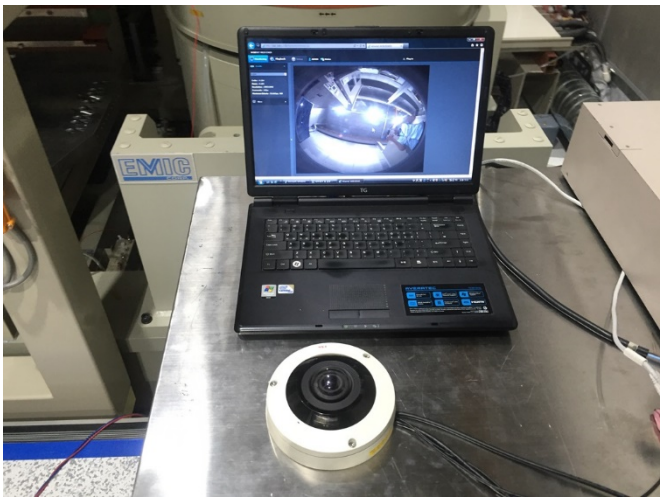
[Transverse (X)]

[Longitudinal (Y)]

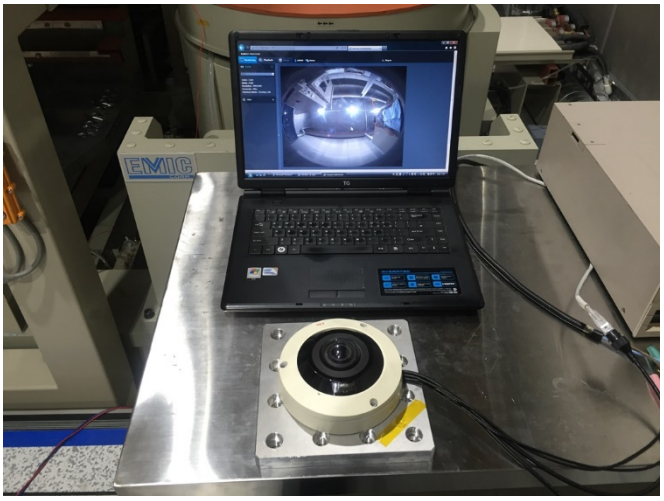
4.3.6 Video output



[After the test, Vertical (Z)]



[After the test, Transverse (X)]



[After the test, Longitudinal (Y)]

4.4 Cooling test

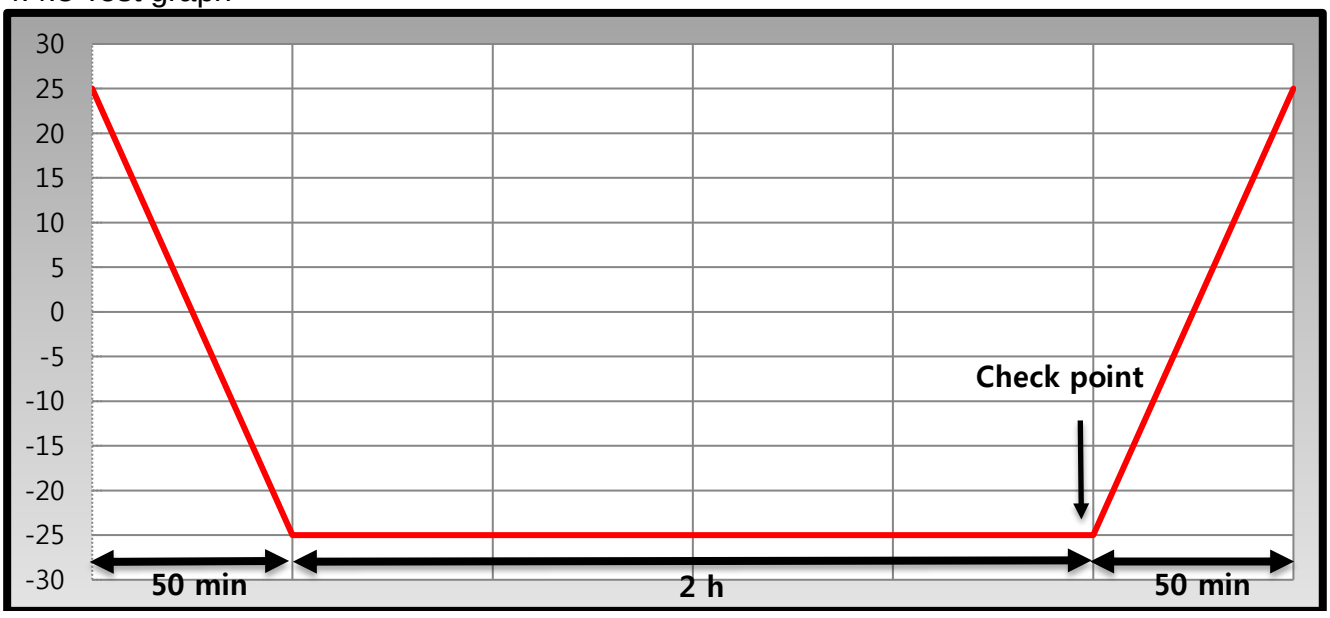
4.4.1 Test Equipment

Description	Model	Manufacturer	Serial Number	Due Cal
Chamber	EC-86LHHP	HITACHI / JAPAN	U5545656	2017. 02. 11

4.4.2 Test Condition

Test standard	EN 50155: 2007(Section 12.2.3 Class T3 # Column 1)
Test temperature	- 25 ℃
Test time	3 h 40 min
Sample quantity	1 ea
Sample condition	Unpackaged product / Non-operation(Check point power on)
Check Point	Before the test, During the test, After the test

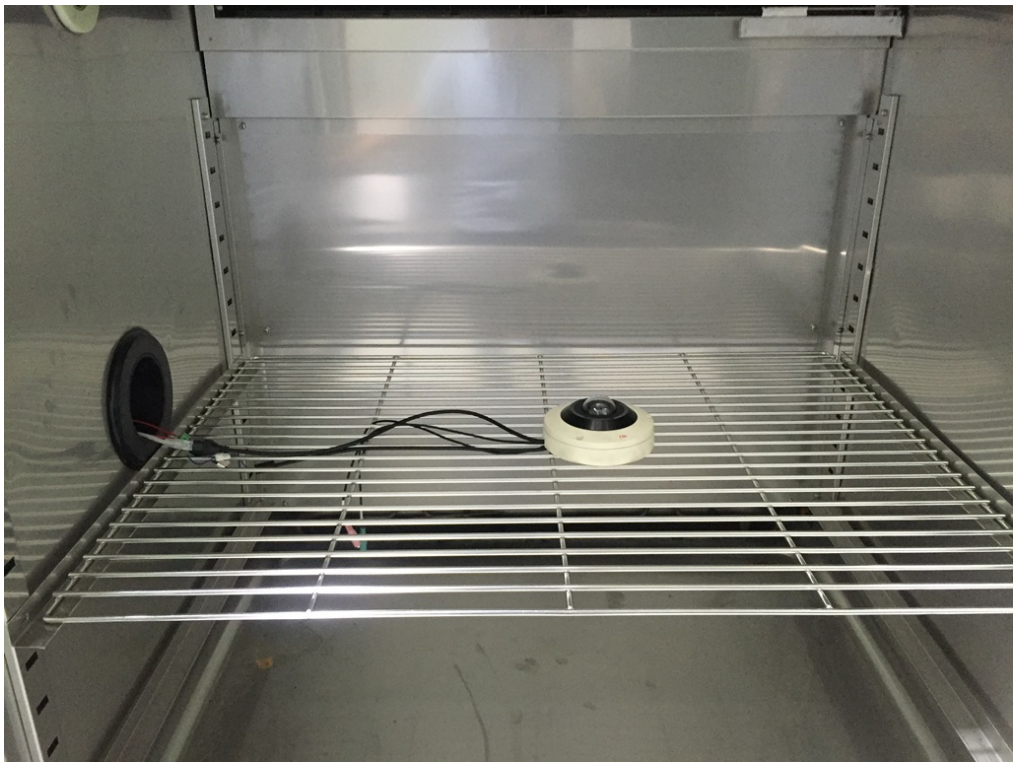
4.4.3 Test graph



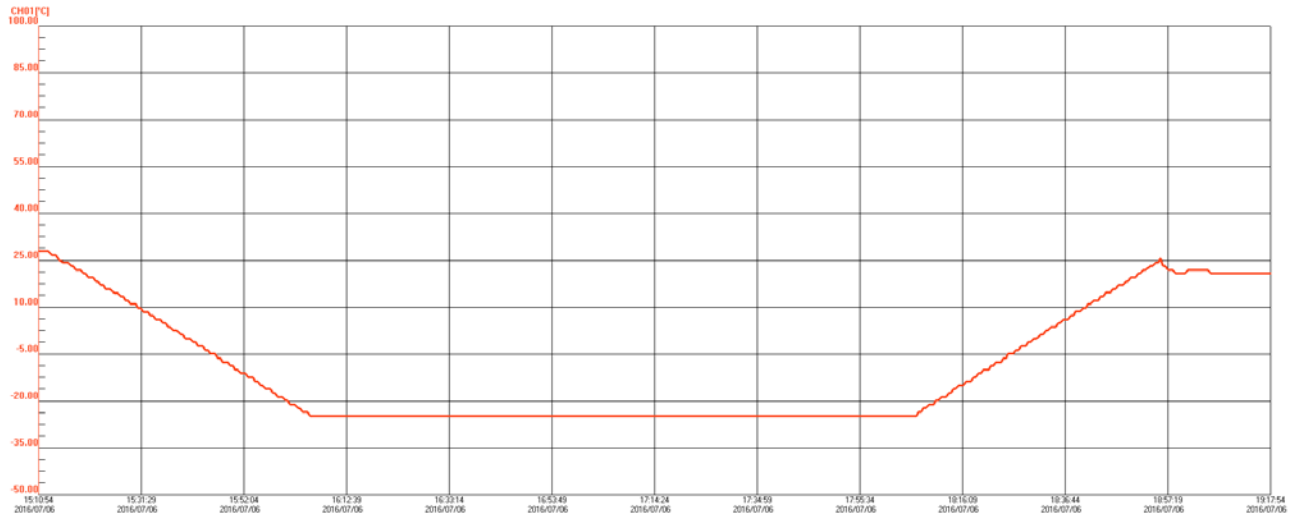
4.4.4 Test Result

Check list	Test Result
Check if deformation, crack, discoloration and corrosion	No abnormal was found
Video output (Before the test, During the test, After the test)	Refer to 4.4.7

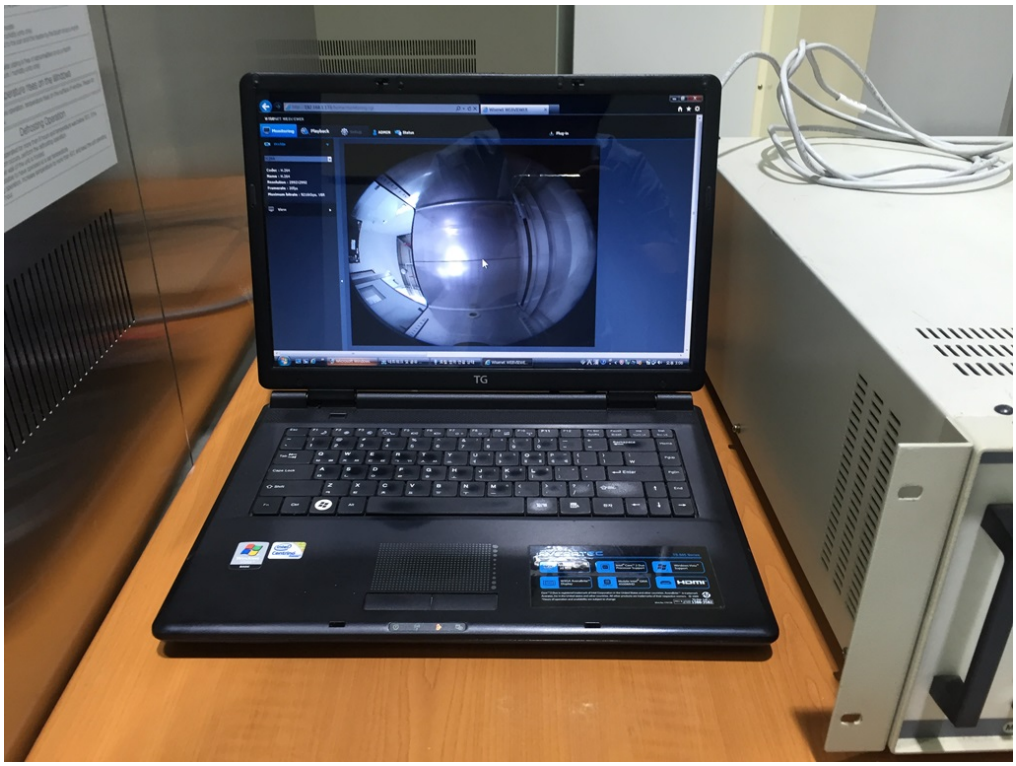
4.4.5 Test Photograph



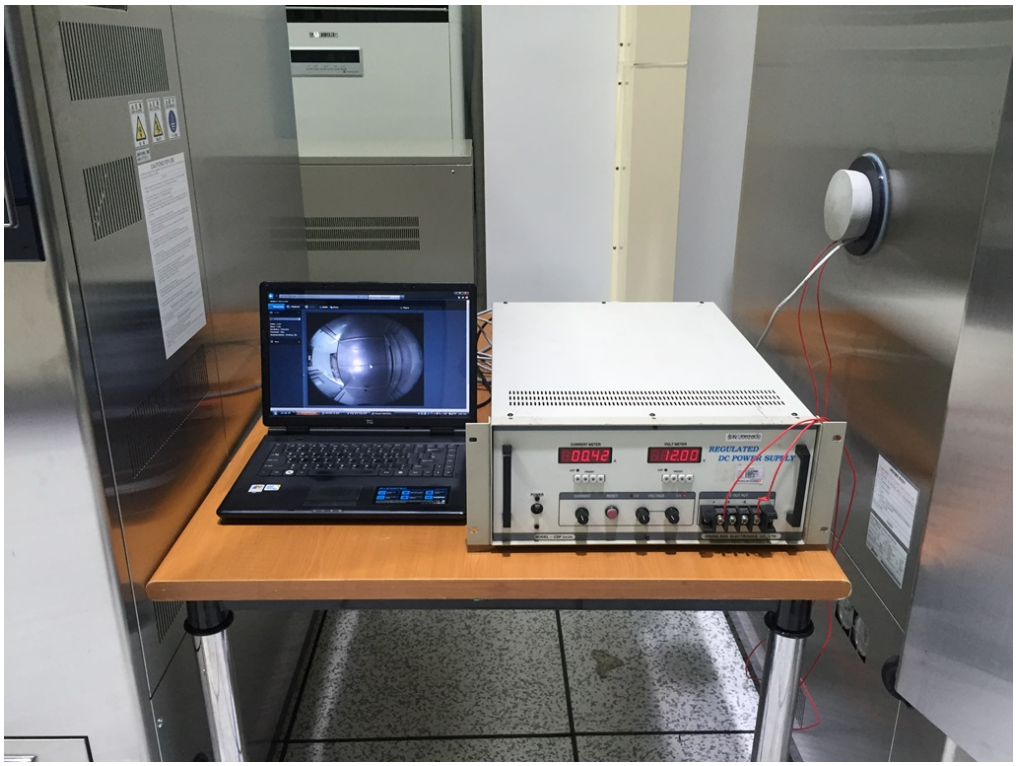
4.4.6 Temperature graph



4.4.7 Video output



[Before the test]



[During the test]

[After the test]

4.5 Dray heat test(T2)

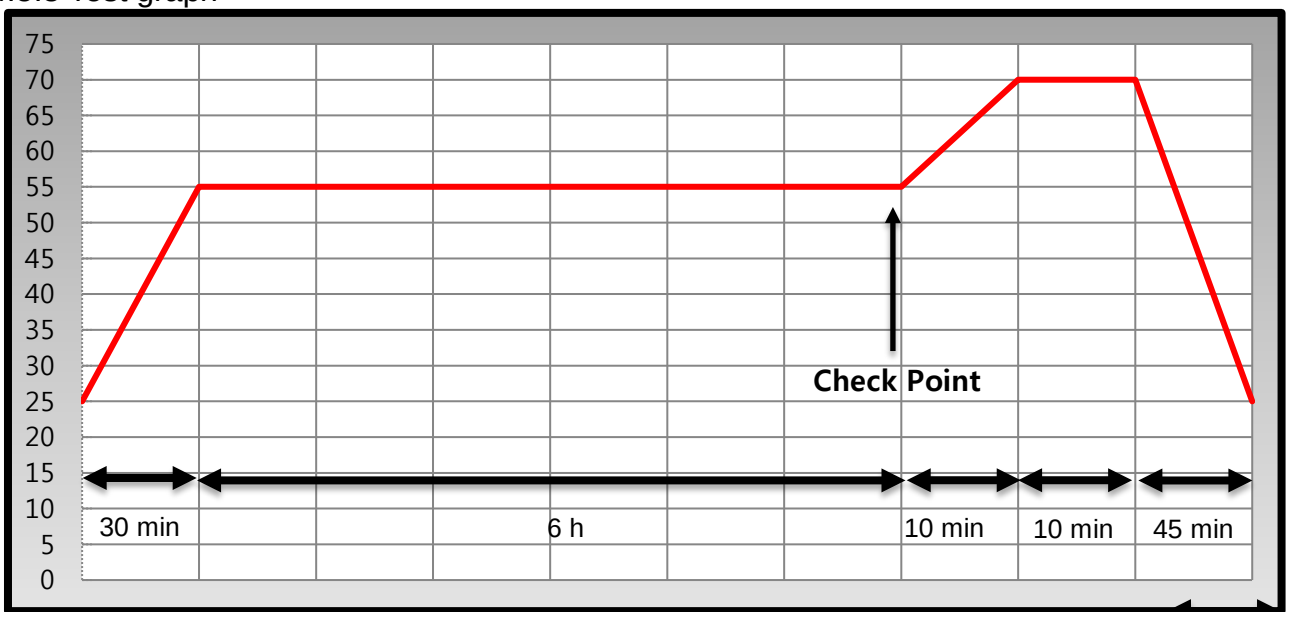
4.5.1 Test Equipment

Description	Model	Manufacturer	Serial Number	Due Cal
Chamber	EC-86LHHP	HITACHI / JAPAN	U5545656	2017. 02. 11

4.5.2 Test Condition

Test standard	EN 50155: 2007(Section 12.2.3 Class T2 # Column 2)
Test temperature	(55 ~ 70) ℃
Test time	7 h 35 min
Sample quantity	1 ea
Sample condition	Unpackaged product / Non-operation(Check point power on)
Check Point	Before the test, During the test, After the test

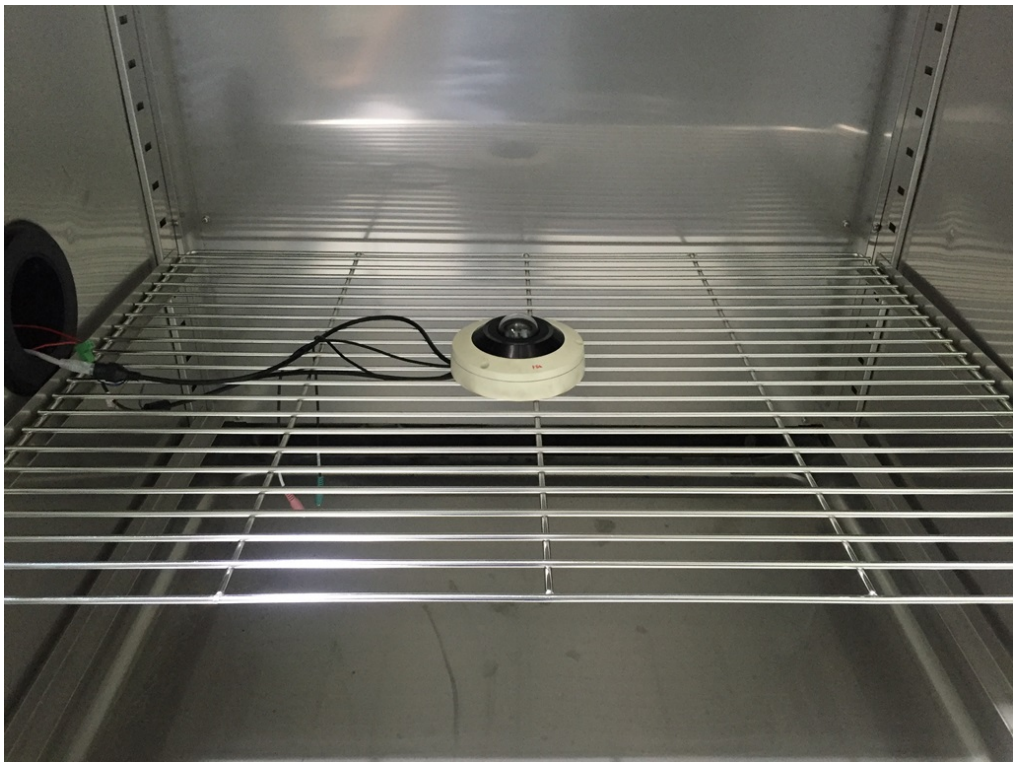
4.5.3 Test graph



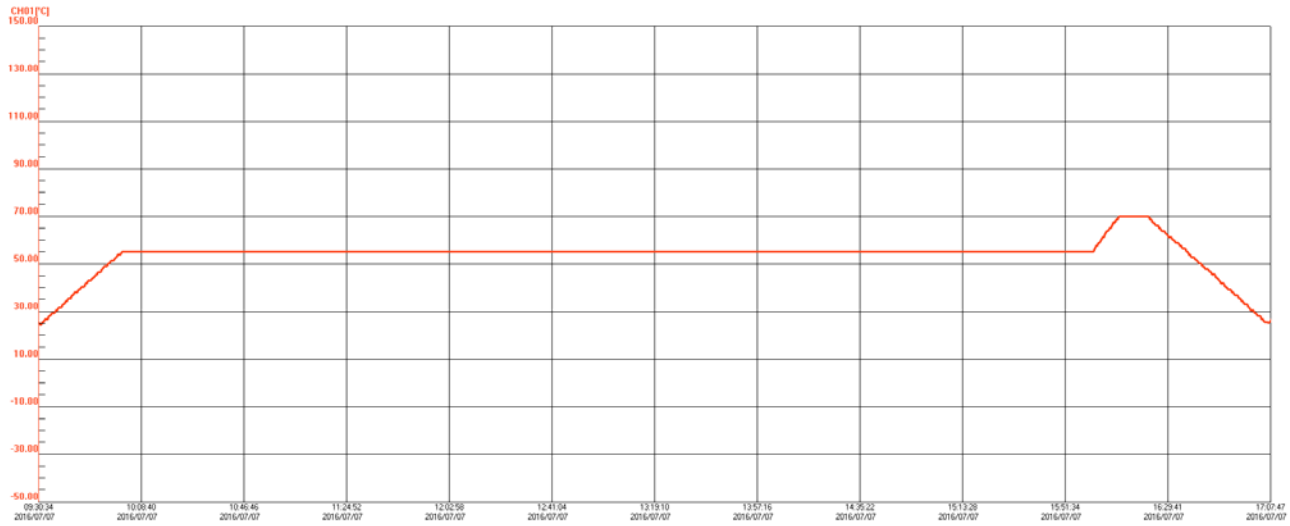
4.5.4 Test Result

Check list	Test Result
Check if deformation, crack, discoloration and corrosion	No abnormal was found
Video output (Before the test, During the test, After the test)	Refer to 4.5.7

4.5.5 Test Photograph

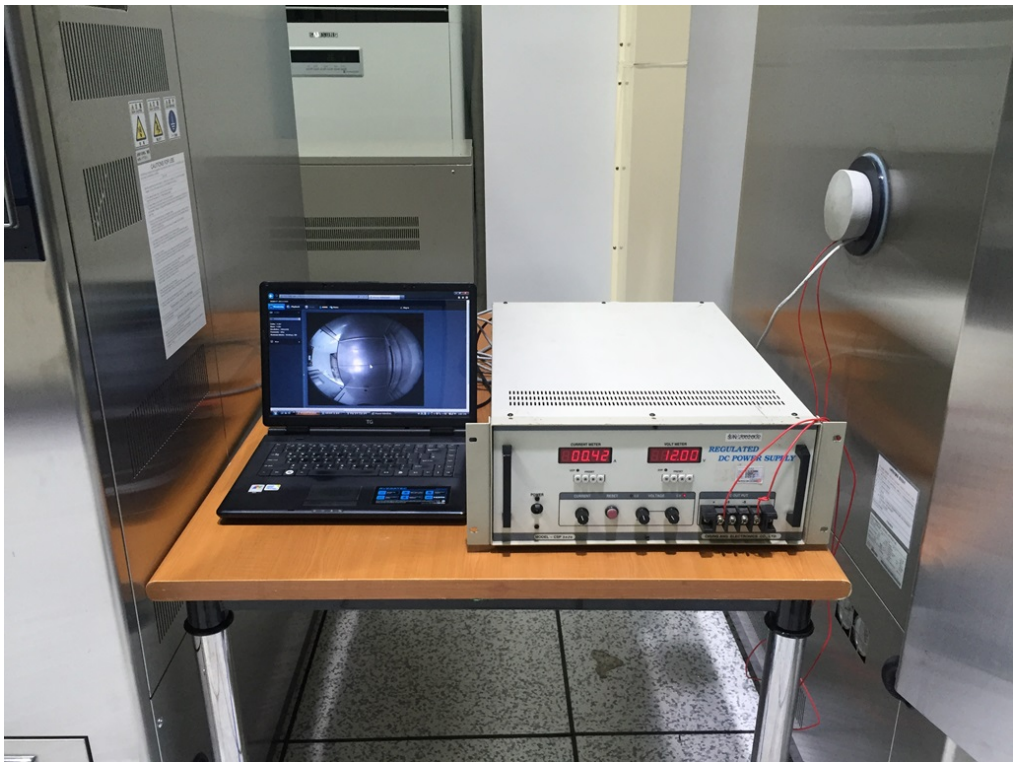


4.5.6 Temperature graph



4.5.7 Video output

[Before the test]



[During the test]

[After the test]

4.6 Dray heat test(TX)

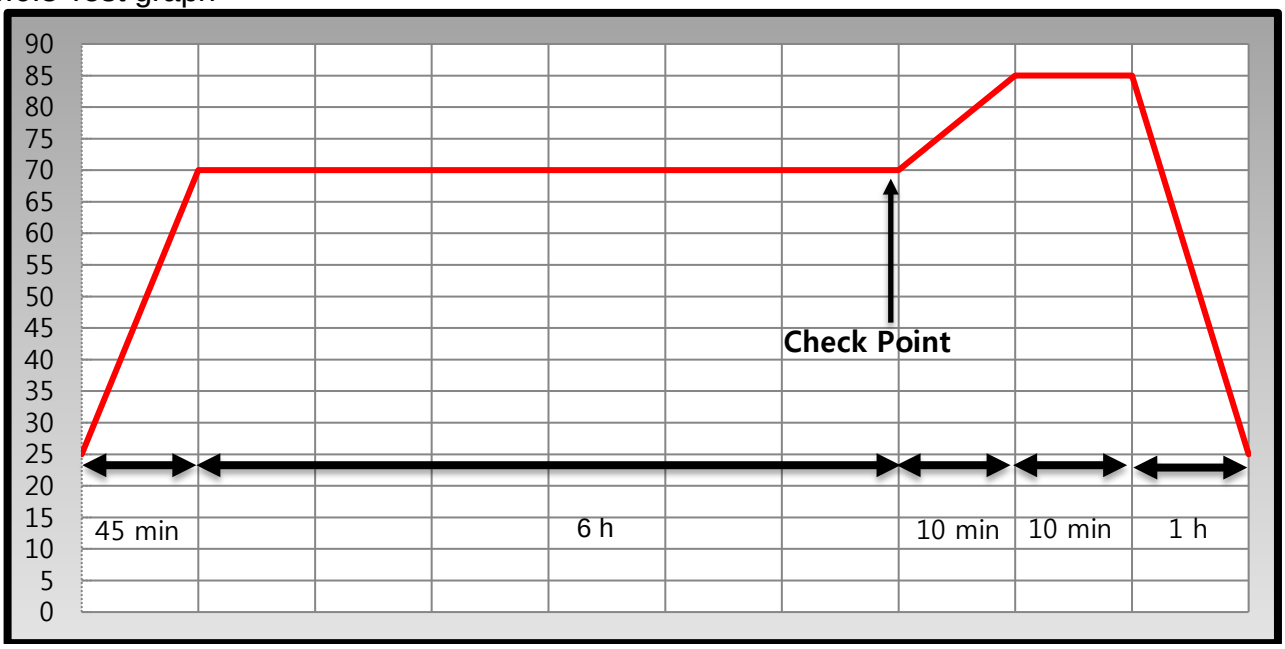
4.6.1 Test Equipment

Description	Model	Manufacturer	Serial Number	Due Cal
Chamber	EC-86LHHP	HITACHI / JAPAN	U5545656	2017. 02. 11

4.6.2 Test Condition

Test standard	EN 50155: 2007(Section 12.2.3 Class T2 # Column 2)
Test temperature	(70 ~ 85) ℃
Test time	8 h 5 min
Sample quantity	1 ea
Sample condition	Unpackaged product / Non-operation(Check point power on)
Check Point	Before the test, During the test, After the test

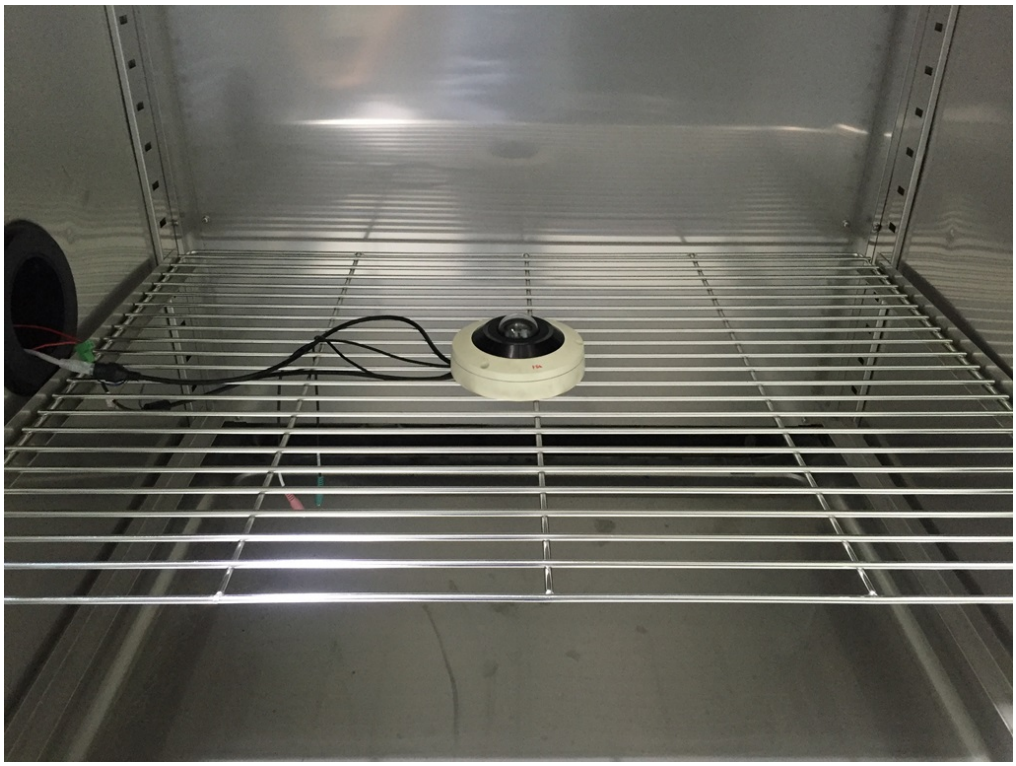
4.6.3 Test graph



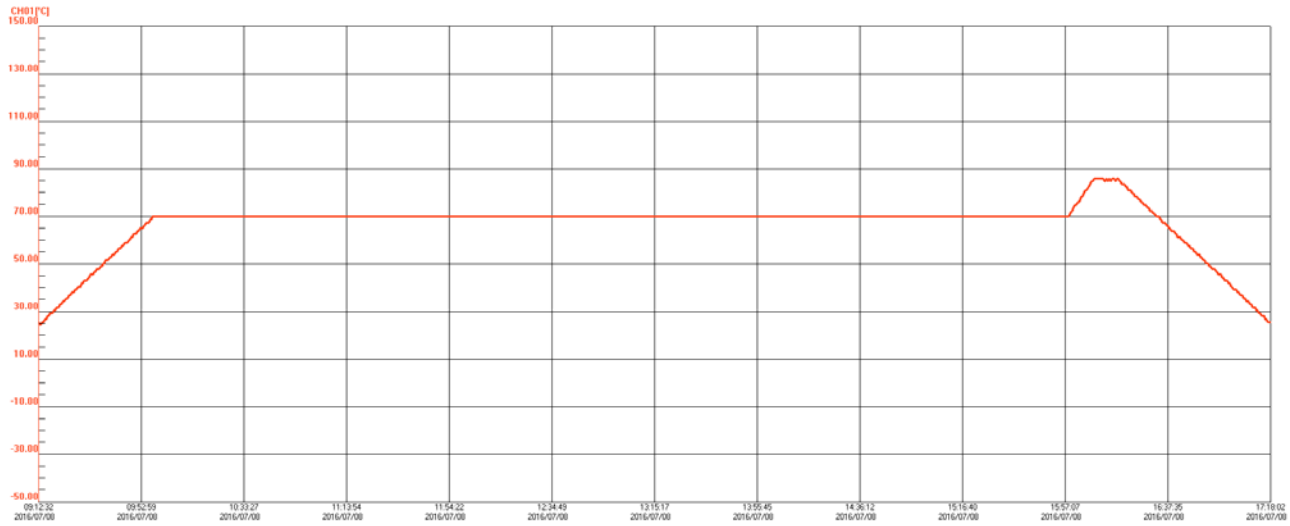
4.6.4 Test Result

Check list	Test Result
Check if deformation, crack, discoloration and corrosion	No abnormal was found
Video output (Before the test, During the test, After the test)	Refer to 4.6.7

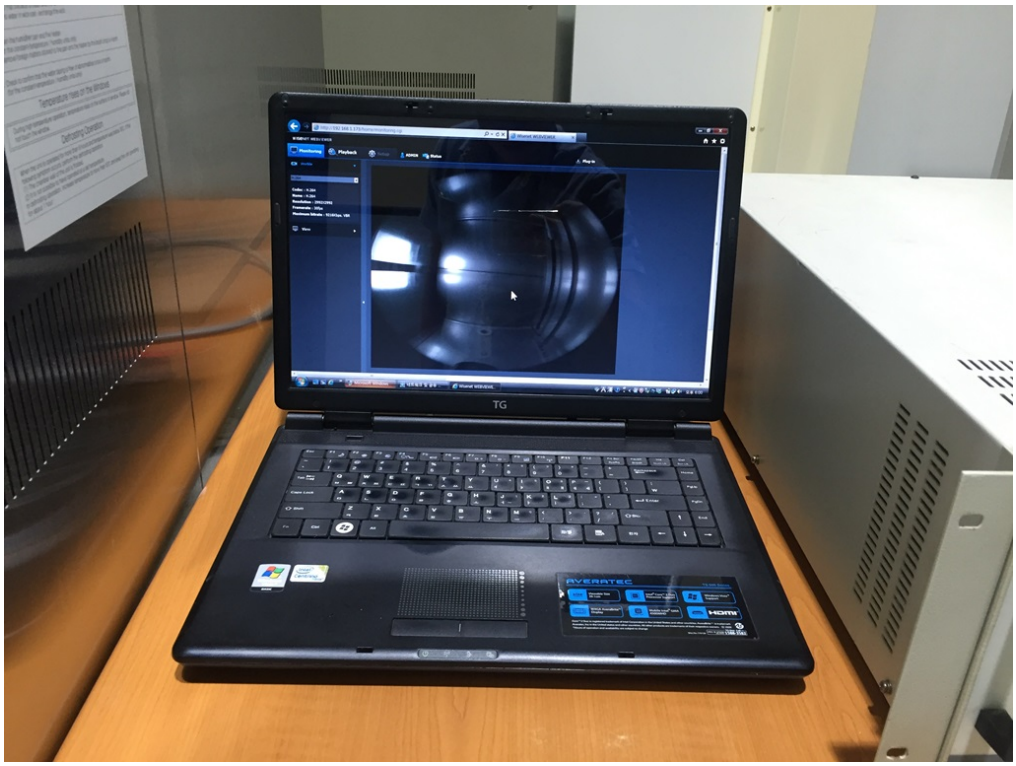
4.6.5 Test Photograph



4.6.6 Temperature graph

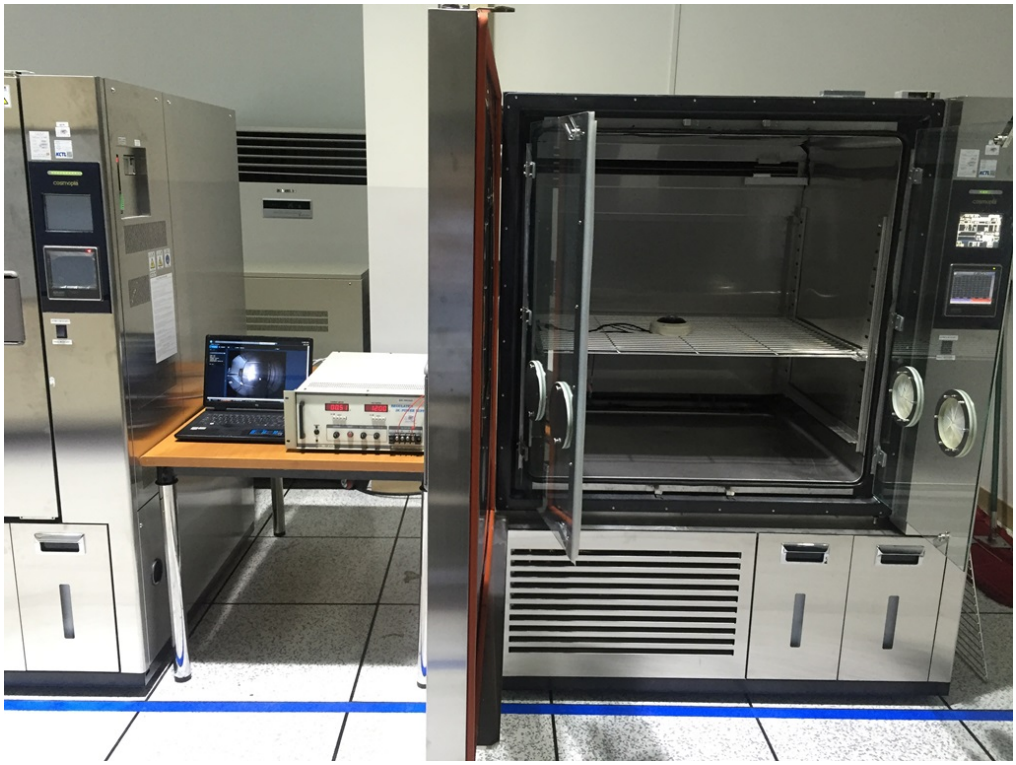


4.6.7 Video output



[Before the test]

[During the test]



[After the test]

4.7 Protection against access to hazardous parts (IP6X)

4.7.1 Test Equipment

Instrument description	Model	Manufacturer	Serial number	Due Cal
Test Probe D	None	CERTIS	None	2018-01-15
Push Pull Gauge	AP-20	ATTONIC	21888	2017-03-17

4.7.2 Test Conditions

Item	Description
First characteristic numeral	IP6X (Protected against access to hazardous parts with a wire)
Test condition	1. Access probe: 1.0 mm ø, 100 mm length, 2. Test force: 1 N ± 10 %
Test location	All of the outside openings
Definition	The access probe of 1.0 mm ø shall not penetrate

4.7.3 Test Method

1) The access probe is pushed against or (in case of the test for first characteristic numeral 2) inserted through any openings of the enclosure with the force specified

4.7.4 Test Result

Check List	Test Result
Protected against access to hazardous parts with a wire	No abnormal was found

4.7.5 TEST Photograph

[During the test]

4.8 Protection against solid foreign objects test (IP6X)

4.8.1 Test Equipment

Instrument description	Model	Manufacturer	Serial number	Due Cal
Dust Chamber	JFMD-002	JFM	20160201	N/A
Vacuum gauge	(-0.1~0) MPa	M.S	N/A	2017-02-19
STOP WATCH	HS-3	CASIO	510Q07	2017-12-01

4.8.2 Test Conditions

Item	Description
First characteristic numeral	IP6X (Dust-tight)
Enclosures	Category 1
Test condition	The talcum powder used shall be able to pass through a square-meshed sieve the nominal wire diameter of which is 50 µm and the nominal width of a gap between wires 75 µm. The amount of talcum powder to be used is 2 kg per cubic metre of the test chamber volume
Test time	8 h
Definition	No ingress of dust

4.8.3 Test Method

1) The enclosure under test is supported inside the test chamber and the pressure inside the enclosure is maintained below the surrounding atmospheric pressure by a vacuum pump
2) The suction connection shall be made to a hole specially provided for this test
3) The object of the test is to draw into the enclosure, by means of depression, a volume of air 80 times the volume of the sample enclosure tested without exceeding the extraction rate of 60 volumes per hour. In no event shall the depression exceed 2 kPa (20 mbar) on the manometer
4) If an extraction rate of 40 to 60 volumes per hour is obtained the duration of the test is 2 h.
5) If, with a maximum depression of 2 kPa (20 mbar), the extraction rate is less than 40 volumes per hour, the test is continued until 80 volumes have been drawn through, or a period of 8 h has elapsed.

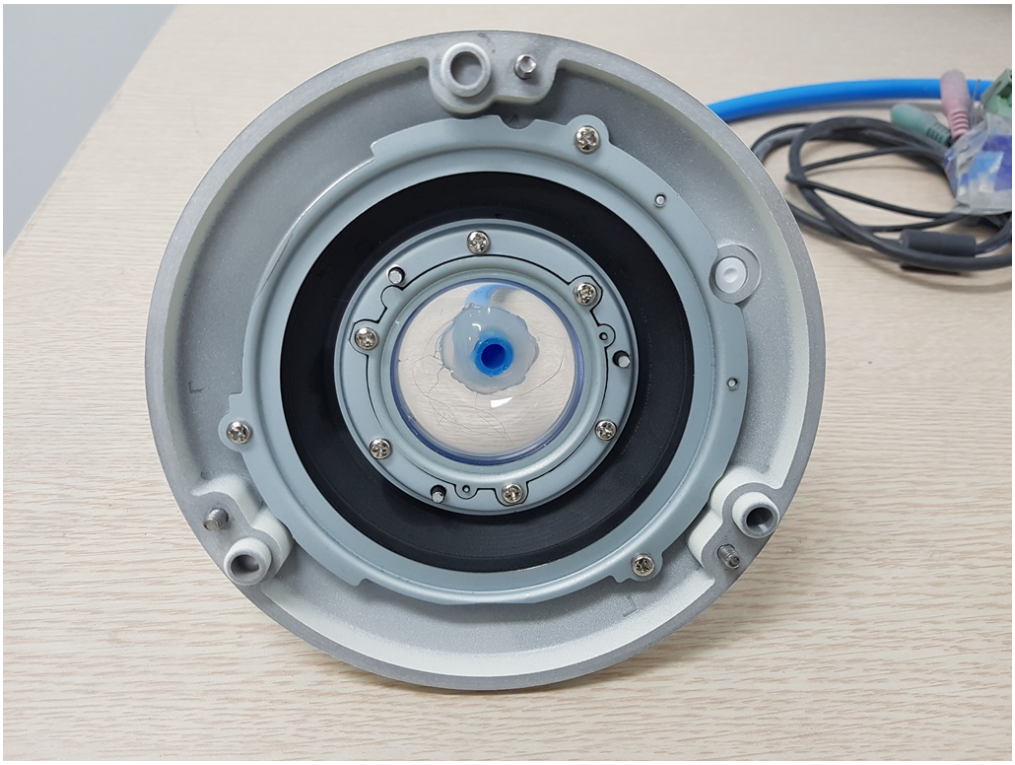
4.8.4 Test Result

Check List	Test Result
Dust-tight	No abnormal was found

4.8.5 TEST Photograph

[During the test]

[After test]



[Test result confirme]

4.9 Protection against water test (IPX6)

4.9.1 Test Equipment

Instrument description	Model	Manufacturer	Serial number	Due Cal
Flow Meter	F-1000-RT	BLUE-WHITE	01	2017-03-02
Spray Nozzle for IPX6	IP06-N	ELEX POLYTECH	0160054	2017-03-17
Measuring Tape	3.5m	KOMELON	-	2018-07-07
STOP WATCH	HS-3	CASIO	510Q07	2017-12-01

4.9.2 Test Conditions

Item	Description
Second characteristic numeral	IPX6 (Protected against powerful water jets)
Test condition	1. Water jet hose nozzle diameter: 12.5 mm 2. Water flow rate: 100 L/min ± 5 % 3. Distance: 2.5 ~ 3.0 m
Test time	1 min/m^2, at least 3 min
Definition	Water projected in powerful jets against the enclosure from any direction shall have no harmful effects

4.9.3 Test Method

1) The tests are conducted with fresh water

2) The water pressure is adjusted to give the specified delivery rate

3) The test is made by spraying the enclosure from all practicable directions with a stream of water from a standard test nozzle

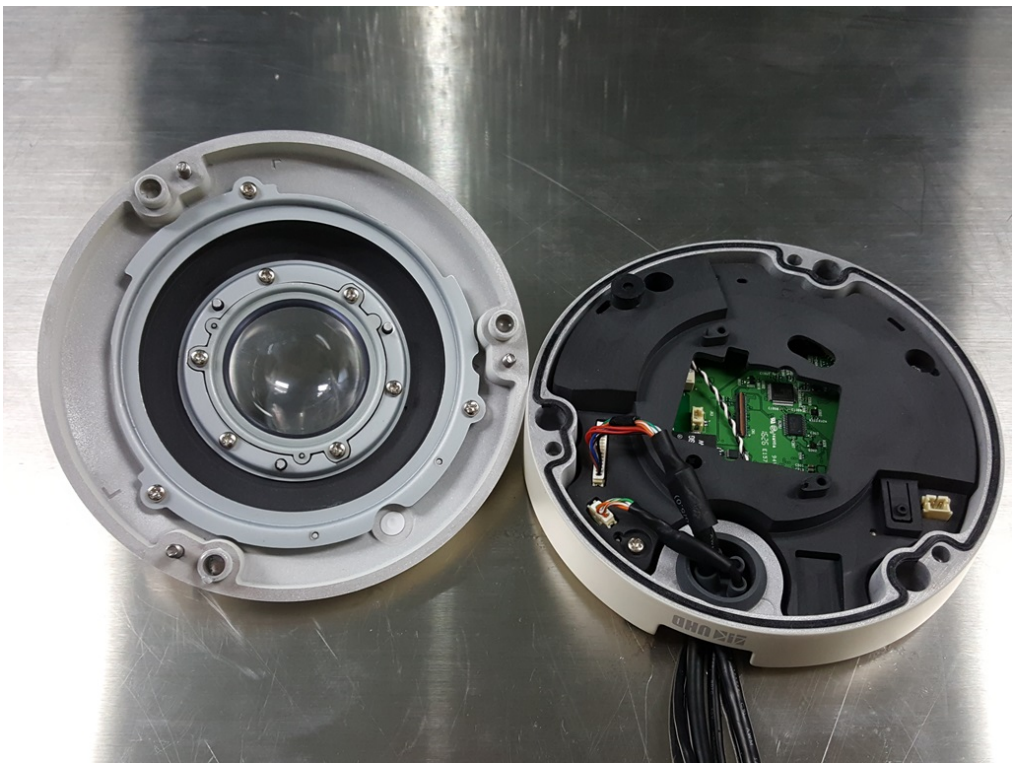
4.9.4 Test Result

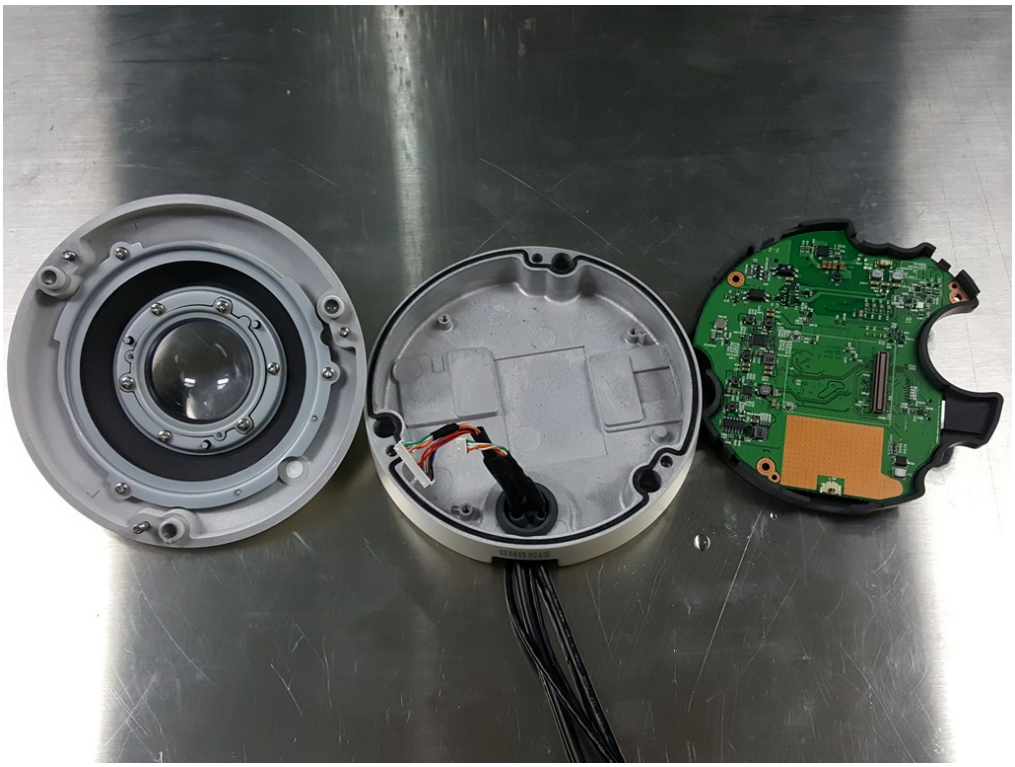
Check List	Test Result
Protected against powerful water jets	No abnormal was found

4.9.5 TEST Photograph

[During the test]]

[During the test_Water flow rate]





[Test result confirme]

4.10 IK10 Impacts Test

4.10.1 Test Equipment

Instrument description	Model	Manufacturer	Serial number	Due Cal
20J IMPACT ELEMENT	N/A	CERTIS	N/A	2016. 12. 05
Measuring Tape	3.5 m	Komelon	N/A	2018.07.07
ELECTRONIC BALANCE	DB-60H	CAS	IY1142	2017. 02. 28
Pendulum Hammer	N/A	N/A	N/A	N/A

4.10.2 Reference Documents

IEC 62262 and IEC 60068-2-75
Degrees of protection provided by enclosure for electrical equipment against external mechanical impacts (IK code)

4.10.3 Test Performed

Degree of protection provided by enclosure for external impacts IK10

4.10.4 Test Conditions

According to standard IEC 62262 and IEC 60068-2-75
The verification of IK10 has been done positioning the enclosure on a rigid support.
5 impacts have been applied on each surface in sight with the enclosure.
For the test used Pendulum Hammer

IK10 (Characteristrics of impact test):

Energy: 20 Joule
Mass: 5.0 kg
High △h: 400 mm

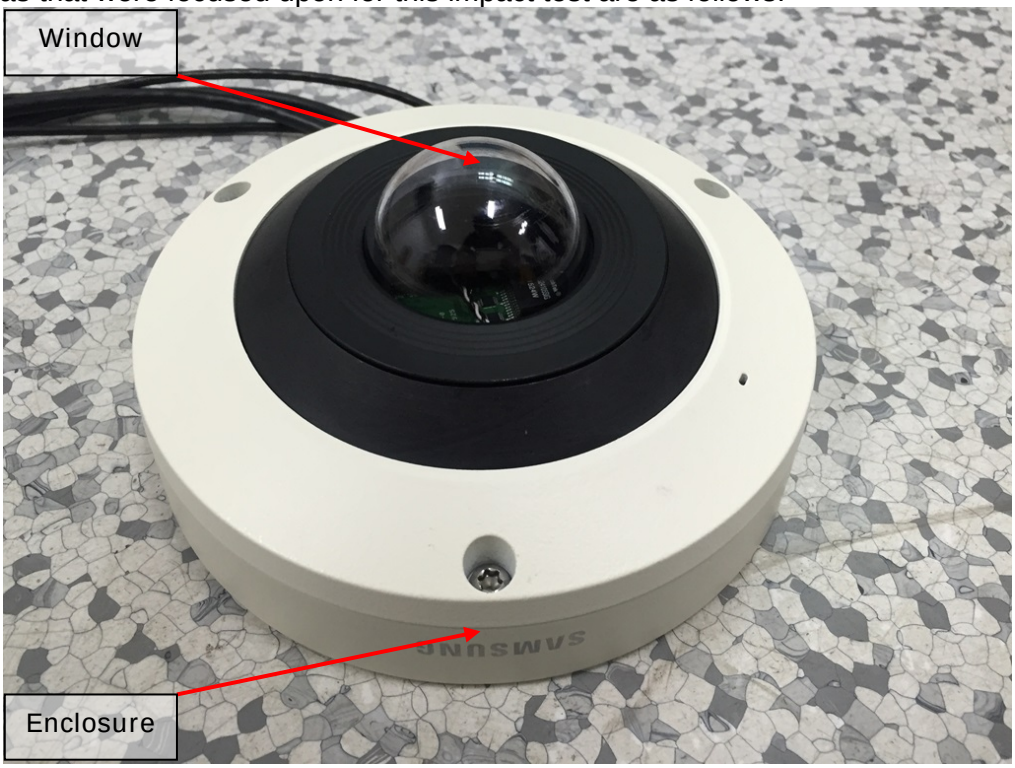
Allow extent of damage: Allow the damage of enclosure some crack

4.10.5 Test Criteria

Visual inspection after impact test.
Check if breakage, Crack, separation occur.
Protection against direct contact

4.10.5 Drop Zones:

The areas that were focused upon for this impact test are as follows:



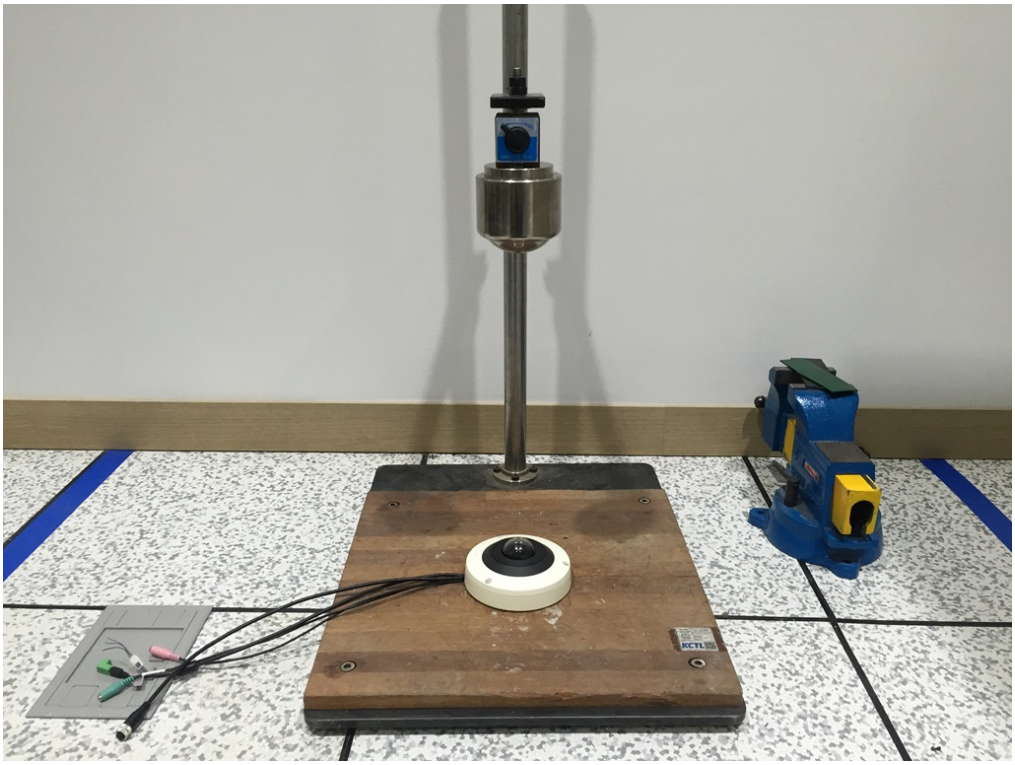
4.10.6 Test Results

Drop Zone: Window		
Drop #	**Orientation**	**Results**
Drop 1	Vertical drop onto center of Window.	No abnormal was found ※ Refer to 4.10.8

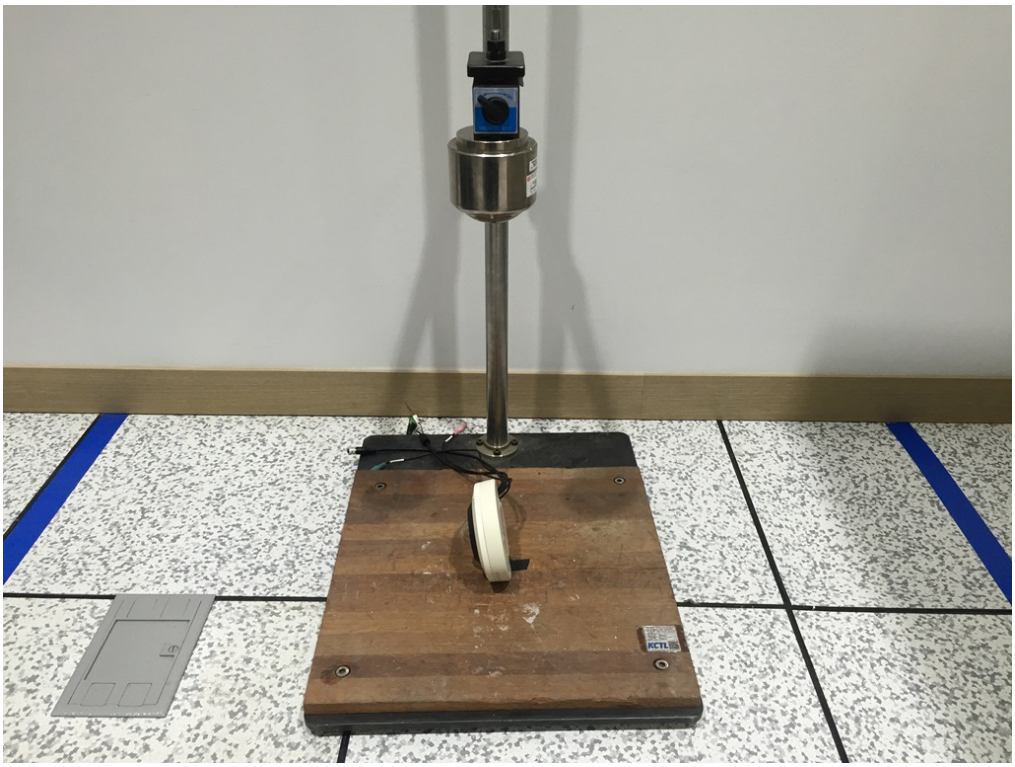
Drop Zone: Enclosure		
Drop #	**Orientation**	**Results**
Drop 1	Normal to surface of enclosure.	No abnormal was found ※ Refer to 4.10.8
Drop 2	Normal to surface of enclosure, about 90° circumferentially from previous drop.	
Drop 3	Normal to surface of enclosure, about 90° circumferentially from previous drop.	
Drop 4	Normal to surface of enclosure, about 90° circumferentially from previous drop.	
Drop 5	Normal to surface of enclosure, about 90° circumferentially from previous drop.	

-Allow extent of damage: Crack less than 10 mm

4.10.7 TEST Photograph



[During the test_Window]



[During the test_Enclosure]

3.10.8 Test Result Photograph

[Test result_Enclosure]