

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-2025-02229

Page (1) / (27) pages

1. Applicant

- Name : Hanwha Vision Co., Ltd
- Address : 6 Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si,
Gyeonggi-do, 13488 Republic of Korea
- Date of Receipt : May. 17, 2021

2. Manufacturer

- Name : Hanwha Vision Co., Ltd

3. Use of Report :

Quality control

4. Test sample / Model :

NETWORK CAMERA / PNM-9031RV

5. Date(s) of test :

May. 17, 2021~ May. 24, 2021

6. Test Standard (Method) used :

NEMA 250-2014

Enclosures for Electrical Equipment (1000 Volts Maximum)

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

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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: HyungUk Jeon (Signature) 	Name: HoHyun Lee (Signature) 

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

Aug. 22, 2025

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REPORT No.:
CTK-2025-02229
Page (2) / (27) pages

Table of Contents

1. Testing laboratory	3
1.1 Testing laboratory information	3
1.2 Testing laboratory accreditation status	3
2. Product description and equipment information	3
2.1 Product description	3
2.1 Model description	4
2.2 Manufacturer information	4
2.3 Equipment information	5
2.4 Pre-test product images	6
3. Test Information	7
3.1 Test item particulars and Possible test case verdicts	7
3.2 General remarks and factory information	8
3.3 Type 4X Test information	9
3.4 NEMA 250-2014 Test list	11
3.5 Attachment 1 - Construction Diagram and installation method.....	14
3.6 Attachment 2 - Parts List	17
4. Hose Down Test (Clause 5.7)	23
4.1 Test date and environmental conditions.....	23
4.2 Test Conditions and methods	23
4.3 Attachment 3 - Photographs	24
4.4 Test result	25
4.5 Post-test product images	26

	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-2025-02229 Page (3) / (27) pages	
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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.	+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	

2. Product description and equipment information

2.1 Product description

Product Name	Model Name	Quantity	Comment
NETWORK CAMERA	PNM-9031RV	1 EA	—

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REPORT No. :
CTK-2025-02229
Page (4) / (27) pages

2.2 Model description

Basic Model	PNM-9031RV
Series model	PNM-C9022RV, PNM-A13022RV
Model differences	Use of the same external shape and materials (case, finishing material, PCB, cable, etc.), differences in fixed lens inside the product.

2.3 Manufacturer information

Test item description	NETWORK CAMERA
Trade Mark	 Hanwha Vision
Manufacturer	Lot O-2, Que Vo Industrial Zone extended area, Nam Son Ward, Bac Ninh province, Vietnam
Model/Type reference	PNM-9031RV
Ratings.....	PNM-9031RV: DC 12  V 1.7 A, PoE (53 V ) 0.45 A PNM-C9022RV DC 12 V  1.83 A, PoE (53 V ) 0.47 A PNM-A13022RV DC12 V  1.67 A, PoE (53 V ) 0.42 A Dimension: Ø 132.4 mm by 415.7 mm, Ø 253 mm by 794.4 mm, Ø 10 mm by 314 mm, Ø 25 mm by 78.5 mm

List of Attachments (including a total number of pages in each attachment):

Attachment 1: 14-16 pages (Construction Diagram including installation method)

Attachment 2: 17-21 pages (Parts List)

Attachment 3: 23-27 pages (photographs)

Summary of testing:

Tests performed (name of test and test clause):
Clause 5.7(Hose Down Test)

Testing location:

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REPORT No. :
CTK-2025-02229
Page (5) / (27) pages

Copy of marking plate: The artwork above may be only a draft.



2.4 Equipment information

Instr. Code	Instrument Type	Range Used	Mfr./Model	Calibration Date	
				Last	Due
S3-IP18	25.4mm Nozzle	25.4 mm	CTK/S3-IP18	-	Checked by calliper below before using
S1-SW2	Stop Watch	0.01 s	CASIO/ NONE	2021-03-03	2023-03-03
C-S1-D09	Steel Measuring Tape	5 m	KOMELON/KMC-74N	2019-07-02	2021-07-02
S3-IP23	Water flow meter	250LPM	Nuri tech/ Z-6504	2020-07-01	2021-07-01
C-S1-D03	DIGITAL VERNIER CALIPER	200 mm	MITUTOYO	2021-03-03	2022-03-03



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REPORT No.:
CTK-2025-02229
Page (6) / (27) pages

2.5 Pre-test product images

2.5.1 Test sample



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REPORT No.:
CTK-2025-02229
Page (7) / (27) pages

3. Test Information

3.1 Test item particulars and Possible test case verdicts

Test item particulars	NETWORK CAMERA
Classification of installation and use	Outdoor (Watertight/Corrosion Resistant)
Possible test case verdicts:	
- test case does not apply to the test object	N/A
- test object does meet the requirement.....	P (Pass)
- test object does not meet the requirement	F (Fail)
- test case does not evaluate to the test object:	N/E

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REPORT No. :
CTK-2025-02229
Page (8) / (27) pages

3.2 General remarks and factory information

General remarks:

"(See Enclosure #)" refers to additional information appended to the report.

"(See appended table)" refers to a table appended to the report.

Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

Clause numbers between brackets refer to clauses in NEMA 250-2014

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 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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REPORT No.:

CTK-2025-02229

Page (9) / (27) pages

3.3 Type 4X Test information

Type 4X

Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against access to hazardous parts; to provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (falling dirt and windblown dust); to provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (rain, sleet, snow, splashing water, and hose directed water); that provides an increased level of protection against corrosion; and that will be undamaged by the external formation of ice on the enclosure.

Table 2-1
Comparison of Specific Applications of Enclosures for Indoor Nonhazardous (Unclassified) Locations

Provides a Degree of Protection against the Following Conditions	Type of Enclosure									
	1	2	4	4X	5	6	6P	12	12K	13
Access to hazardous parts	X	X	X	X	X	X	X	X	X	X
Ingress of solid foreign objects (falling dirt)	X	X	X	X	X	X	X	X	X	X
Ingress of water (dripping and light splashing)	...	X	X	X	X	X	X	X	X	X
Ingress of solid foreign objects (circulating dust, lint, fibers, and flyings **)	...	...	X	X	...	X	X	X	X	X
Ingress of solid foreign objects (settling airborne dust, lint, fibers, and flyings **)	...	...	X	X	X	X	X	X	X	X
Ingress of water (hosedown and splashing water)	...	...	X	X	...	X	X	...	...	...
Oil and coolant seepage	...	...	...	...	...	...	...	X	X	X
Oil or coolant spraying and splashing	...	...	...	...	...	...	...	...	...	X
Corrosive agents	...	...	...	X	...	...	X	...	...	...
Ingress of water (occasional temporary submersion)	...	...	...	...	...	X	X	...	...	...
Ingress of water (occasional prolonged submersion)	...	...	...	...	...	...	X	...	...	...

** These fibers and flyings are not considered Class III type ignitable fibers or combustible flyings. For Class III type ignitable fibers or flyings see the *National Electrical Code*®, Article 500.5(D).

Table 2-2
Comparison of Specific Applications of Enclosures for Indoor & Outdoor Nonhazardous (Unclassified) Locations

Provides a Degree of Protection Against the Following Conditions	Type of Enclosure									
	3	3X	3R	3RX	3S	3SX	4	4X	6	6P
Access to hazardous parts	X	X	X	X	X	X	X	X	X	X
Ingress of solid foreign objects (falling dirt)	X	X	X	X	X	X	X	X	X	X
Ingress of water (dripping and light splashing)	X	X	X	X	X	X	X	X	X	X
Ingress of water (rain, snow, and sleet **)	X	X	X	X	X	X	X	X	X	X
Sleet ***	...	...	...	...	X	X	...	...	...	...
Ingress of solid foreign objects (windblown dust, lint, fibers, and flyings****)	X	X	...	...	X	X	X	X	X	X
Ingress of water (hosedown and splashing water)	...	...	...	...	...	...	X	X	X	X
Corrosive agents	...	X	...	X	...	X	...	X	...	X
Ingress of water (occasional temporary submersion)	...	...	...	...	...	...	...	...	X	X
Ingress of water (occasional prolonged submersion)	...	...	...	...	...	...	...	...	...	X

** External operating mechanisms are not required to be operable when the enclosure is ice covered.

*** External operating mechanisms are operable when the enclosure is ice covered. See subsection 5.6.

**** These fibers and flyings are not considered Class III type ignitable fibers or combustible flyings. For Class III type ignitable fibers or flyings see the *National Electrical Code*®, Article 500.5(D).

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REPORT No. :
CTK-2025-02229
Page (10) / (27) pages

Table 5-1A
Degrees of Protection Against Access to Hazardous Parts

Enclosure Type	Test Conditions	Degree of Protection		Corresponding IP First Characteristic Numeral
		Brief Description	Definition	
4X	5.7	Protected against access to hazardous parts with a wire	An access probe of 1.0 mm shall not penetrate	6

Table 5-1B
Degrees of Protection Against Solid Foreign Objects

Enclosure Type	Test Conditions	Degree of Protection		Corresponding IP First Characteristic Numeral
		Brief Description	Definition	
4X	<u>Non-vented</u> 5.7	Windblown dust protected	No ingress of dust	6
	<u>Vented</u> 5.5.1 Dust Blast Method			

Table 5-1C
Degrees of Protection against Water

Enclosure Type	Test Conditions	Degree of Protection		Corresponding IP Second Characteristic Numeral
		Brief Description	Definition	
4X	5.7	Protected against hose directed water	Water projected against the enclosure in any direction shall not enter	6 No Ingress Allowed*

Table 5-1D
Additional Protection

Enclosure Type	Test Conditions	Additional Protection		Corresponding IP Second Characteristic Numeral
		Brief Description	Definition	
4X	5.6 5.9 5.10	Special corrosion protection and undamaged by the external formation of ice	Enclosure provides increased corrosion protection and is not damaged by ice that forms on the outside	None

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REPORT No. :
CTK-2025-02229
Page (11) / (27) pages

3.4 NEMA 250-2014 Test list

NEMA 250-2014			
Clause	Requirement + Test	Result – Remark	Verdict
3	CONSTRUCTION		
3.1	General		P
3.2	Units of Measurement		P
3.3	Materials-General	Enclosures are made of metal or polymeric materials	P
3.4	Materials-Polymeric	More than 650 mm ² (1 in ²) in area Polymeric Materials used is declared as Min. V-2 Used to UL certified material. (See the attachment 2)	N/E
3.5	Corrosion Protection	Stainless steel and/or aluminium are declared as the materials used (See the attachment 2)	N/E
3.6	Openings	No openings in Product	N/A
3.7	Mounting	Mounting means are external to the equipment cavity (See the attachment 1)	P
3.8	Conduit Connection	No conduit connection (See the attachment 1)	N/A
3.9	Hubs and Fittings	No Hubs and Fittings	N/A
3.10	Knockouts	See the Attachment 1	P
3.11	External Operating Mechanisms	No External Operating Mechanisms	N/A
3.12	Access to Interior	Needs tool to open unit	P
3.13	Closing Hardware	No closing Hardware	N/A

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REPORT No. :
CTK-2025-02229
Page (12) / (27) pages

NEMA 250-2014

Clause	Requirement + Test	Result – Remark	Verdict
3.14	Gaskets	Gaskets made of a silicone Sponge Rubber (no Elastomeric or Thermoplastic used) (See clause 5.14 and the attachment 2)	P
3.15	Observation Windows	No Observation Window	N/A

4	MARKING		
4.1	Type Designations	“Type 4X” Marking is declared to be on the product before on the market	P
4.2	Supplemental Markings	Supplemental Marking (watertight/corrosion resistant) is declared to be used when it is on the market. The required marking shall be added on the product)	P
4.3	Location of Markings	See the Attachment 3	P
4.4	Enclosure Orientation	No Particular Mounting Orientation	N/A
4.5	Conduit Hubs and Closure Plates	No Conduit Hubs and Closure Plates	N/A
4.6	Equipment Openings	No Openings on Unit	N/A
4.7	Drainage Openings	No Drain Openings	N/A

5	DESIGN TESTS		
5.1	General	See Table 5-1A to 5-1D and 5.1.5 in the General product information	P
5.2	Tests For Protection Against Access to Hazardous Parts	Rated 4X	N/A
5.3	Tests for Protection Against Ingress of Water (Dripping and Light Splashing)	Rated 4X	N/A

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REPORT No. :
CTK-2025-02229
Page (13) / (27) pages

NEMA 250-2014

Clause	Requirement + Test	Result – Remark	Verdict
5.4	Tests for Protection Against Ingress of Water (Rain)	Rated 4X	N/A
5.5	Tests for Protection Against Ingress of Solid Foreign Objects (Setting Airborne Dust, Lint, Fibers, And Flings)	Non-vented (See clause 5.7)	N/A
5.6	External Icing Test	No external cavities to trap water when mounted in the normal position.	N/A
5.7	Tests for Protection Against Ingress of Water (Hosedown)	No entry of water See the test information	P
5.8	Indoor Corrosion Protection (Rust-Resistance Test (24-Hour Salt Spray Test))	See clause 3.5	N/E
5.9	Outdoor Corrosion Protection	See clause 3.5	N/E
5.10	Corrosion Protection-Type 3X, 3RX, 3SX, 4X Or 6P Enclosures	See clause 3.5	N/E
5.11	Test for Protection Against Ingress of Water (Temporary Submersion)	Rated 4X	N/A
5.12	Test for Protection Against Ingress of Water (Prolonged Submersion)	Rated 4X	N/A
5.13	Oil Exclusion Test	Rated 4X	N/A
5.14	GASKET MATERIAL TESTS	The product itself(including gaskets) was conditioned at 70 °C for 168 hrs according to 5.14.3(Alternate Evaluation) before performing relevant required tests.	P
5.15	Test for Sharpness of Edges	No sharp edges	P



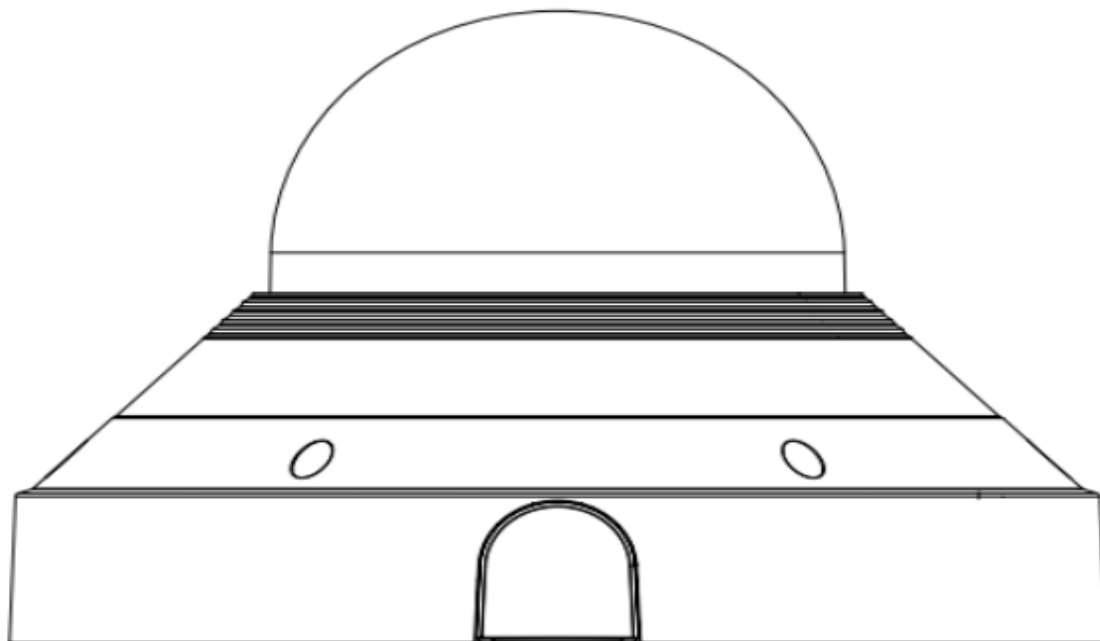
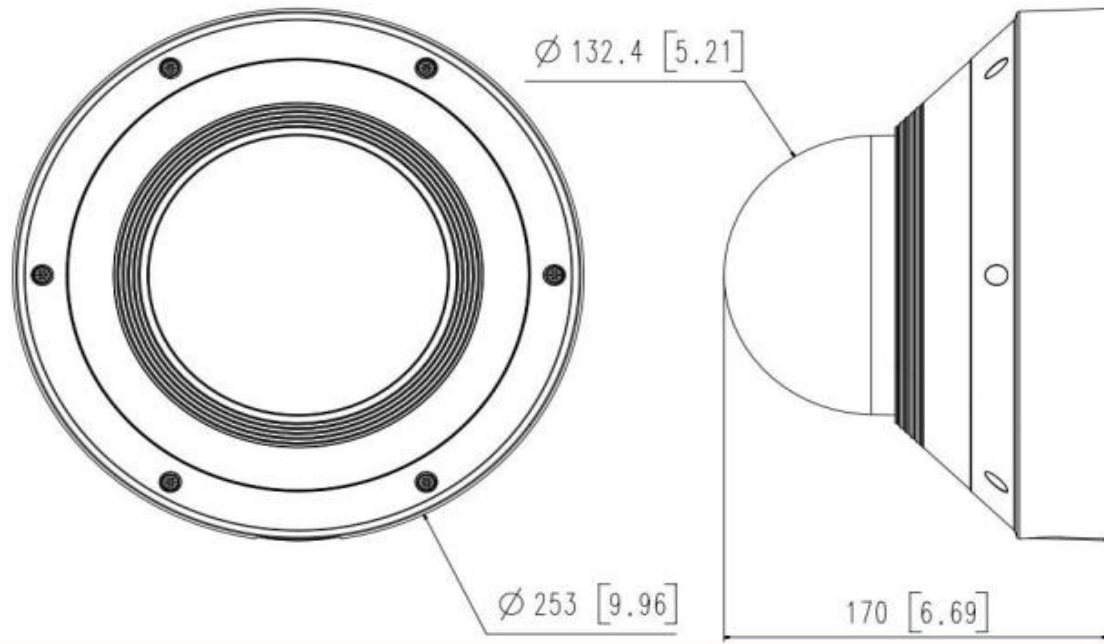
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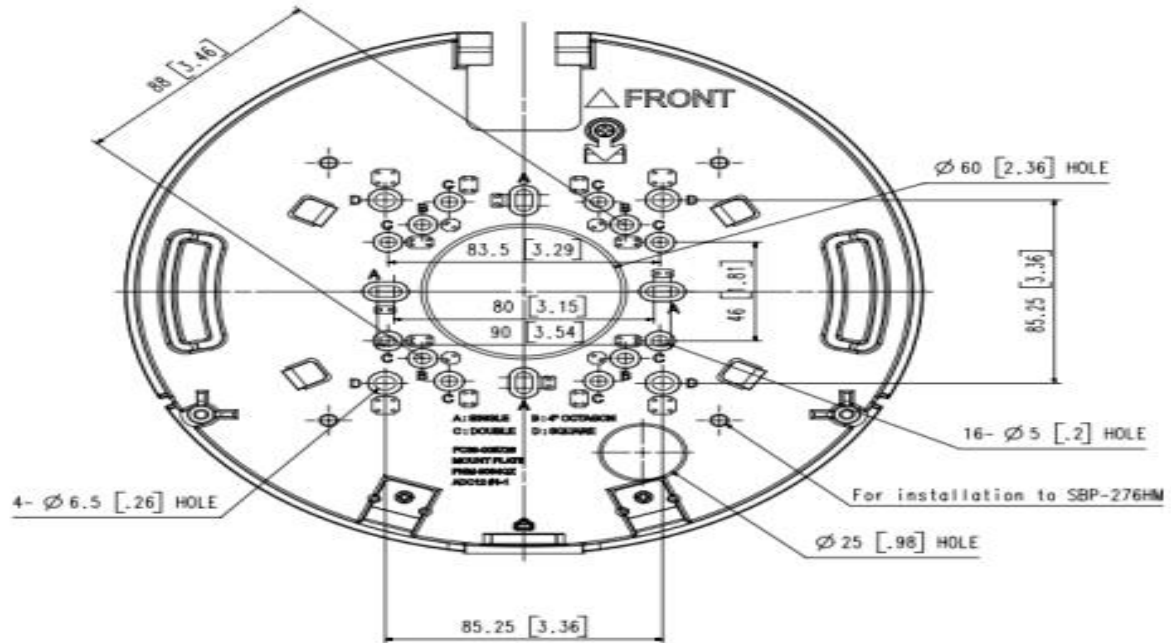
REPORT No.:
CTK-2025-02229
Page (14) / (27) pages

3.5 Attachment 1 - Construction Diagram and installation method

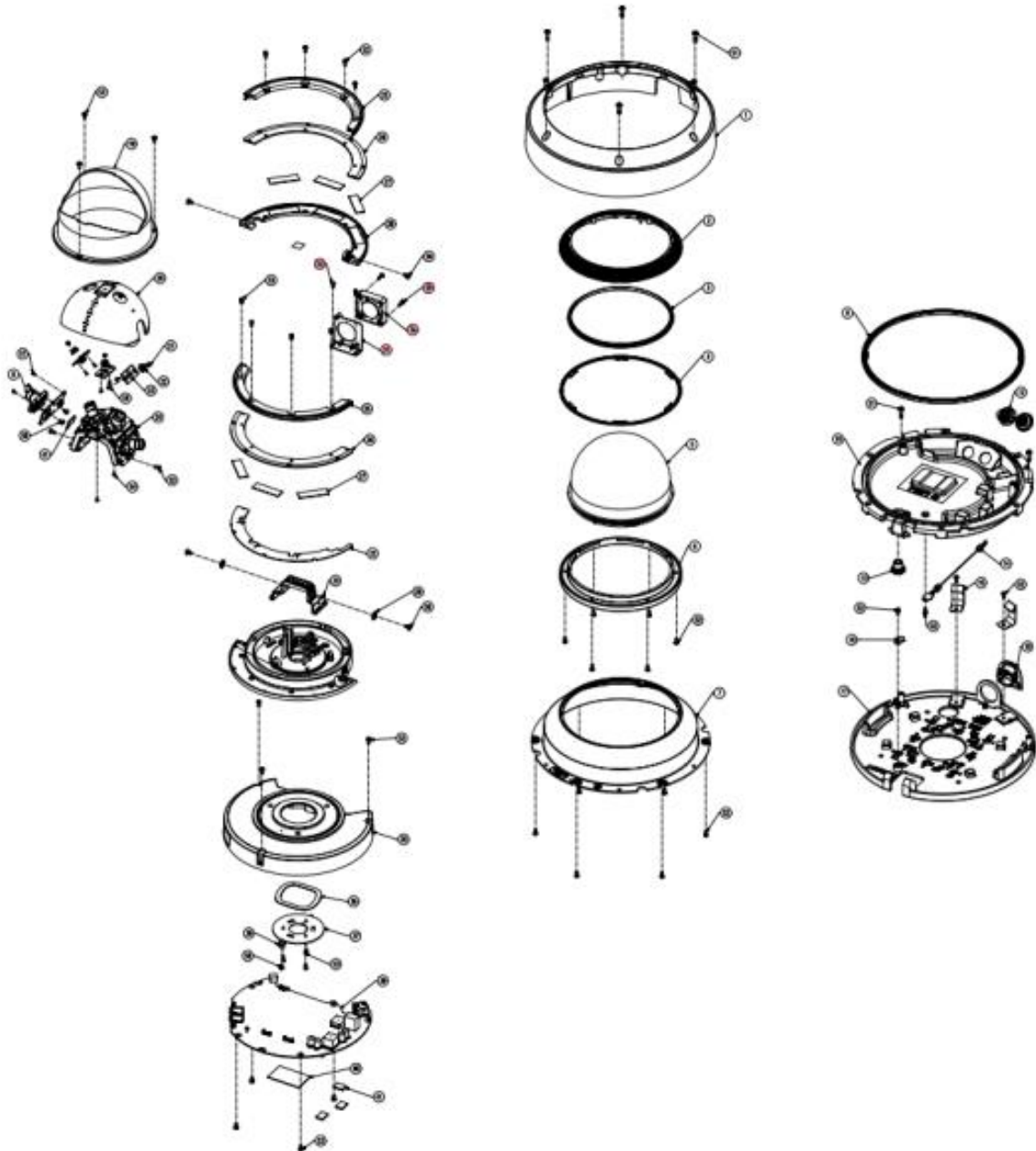
3.5.1 Construction Diagram (1)



3.5.2 Construction Diagram (2)



3.5.3 Installation method



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REPORT No.:
CTK-2025-02229
Page (17) / (27) pages

3.6 Attachment 2 - Parts List**3.6.1 Parts List (1)**

No.	Part No.	Part Name	Q'ty
1	FC29-013952A	CASE-TOP-PNM-9031RV-WN;ADC12	1
2	FC29-013950A	CASE-DOME-PNM-9031RV;ADC12	1
3	FC10-001221A	RUBBER-DOME-PNM-9031RV;SILICON	1
4	FC10-001222A	RUBBER-IR-PNM-9031RV;SILICON	1
5	FC15-007580B	COVER-OPTICAL_HC;DOME-INDOOR-PTZ	1
6	FC09-012378A	BRACKET-IR-PNM-9031RV;ADC12	1
7	FC15-008209A	COVER-IR-PNM-9031RV;PC	1
8	FC36-001358A	SHEET-PROTECT-DOME-280MM	1
9	FC10-001134A	RUBBER-GASKET_PNM-9000VQ;-	1
10	FC29-013951A	CASE-BOTTOM-PNM-9031RV;ADC12	1
11	MC06-001082A	BUSHING-CABLE FLEXIBLE;SILICON,GRAY	1
12	MC06-001042A	BUSHING-CABLE SET;SILICON,PNV-9080R	1
13	HP06-001187	VENT-GORE-PMF100585;MEMBRANE,SCREW IN,PM	1
14	RM01-004164A	WIRE,METALIC-SAFETY_9080VQ;STS304	1
15	FC38-001138A	SPRING,ETC-FIXED_9080VQ;SUS CSP	2
16	FC09-006670A	BRACKET-WIRE-SNO-8081R;SUS304,1.2	1
17	FC15-006682B	COVER-BOT-XNV-6081Z;PC	1
18	FC39-005726A	MOUNT-PLATE_PNM-9084QZ;ADC12,WHITE	1
19	FC29-013949A	CASE-SHIELD-PNM-9031RV;PC	1
20	FC15-008210A	COVER-INNER-PNM-9031RV;PC	1
21	FC15-008208A	COVER-CDS-PNM-9031RV;PC	2
22	FC10-001220A	RUBBER-CDS-PNM-9031RV;SILICON	2
23	AM06-009914A	ASSY,PCB-PNM-9031RV LIGHT SENSOR	2
24	AM08-006791A	ASSY-FRAME-LENS-PNM-9031RV	1
25	FC28-003349A	REFLECTOR-IR-PNM-9031RV;-	2
26	AM06-009911A	ASSY,PCB-PNM-9031RV IR LED	2
27	FC28-003373A	PAD-THERMAL-PNM-9031RV	6
28	FC15-008211A	COVER-DOOR-PNM-9031RV;ADC12	1
29	FC10-001068A	RUBBER-TILT_9020;SILICON	2
30	EP07-002670	FAN,ELECTRIC-HT-04010D12M;DC12V,REVISION	0
31	FC09-012379A	BRACKET-BLOWER-PNM-9031RV;SECC	0
32	EP07-001615A	SINK,HEAT-IR-PNM-9031RV;C5210P	1
33	FC09-012380A	BRACKET-TILT-PNM-9031RV;ADC12	1
34	FC39-006481A	FRAME-PAN-PNM-9031RV;PC	1



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REPORT No.:
CTK-2025-02229
Page (18) / (27) pages

3.6.2 Parts List (2)

35	FC39-006482A	FRAME-MAIN-PNM-9031RV;PC	1
36	FC18-003696A	WASHER,WAVE-WW,46,D47,D61,T0.4,H5.5,SK-5	1
37	FC30-004990A	PLATE-PAN FIXED 9020	1
38	FC29-011838A	STOPPER-PAN_XNV-6081R;AL	1
39	AM06-009907A	ASSY_PCB-PNM-9031RV MAIN	1
40	FC28-003047A	PAD-THERMAL-48X30XT1,K=7W/M-K	1
41	FC28-002489A	PAD-THERMAL_1014T2_V6430BNH	3

No.	Part No.	Part Name	Q'ty
S1	FC18-004000A	SCREW-BUILT-IN_TORX20;0.7,15,NO,4	8
S2	Z9642306007	MACHINE SCREW(M3xL6,Zn-B,넵비머리)	24
S3	Z6003012701A	TSPH_M3L6_BL	12
S4	Z6003019801A	SCREW-TAPTYPE;6003-001440,BH,+,B,M2,L4,	6
S5	Z9642308001	SCREW-TAPTITE;BH,M3,0.5,L6,S,1,1,BLACK	0
S6	Z6009001301A	TAPPING SCREW(M3xL6,와샤볼이형머리,Zn-B)	4
S7	FC18-001254A	SCREW-FLAT HEAD ,M3L8;M3,0.5,L8,MIG,MIG,	3
S8	FC18-005043A	SCREW,TAPPING-M2L4-PWH-WHITE;TAPPING,4,P	1

	PNM-9031RV
10. Thermal pad 재질 정보	KGP-1
11. Internal Plastic 재질 정보	NH-1035
12. 외부 Enclosure	
Top Enclosure (Metal)	Aluminum min. 2.0 mm
Bottom Enclosure (Metal)	Aluminum min. 2.0 mm
Mounted bracket Enclosure	Aluminum min. 2.0 mm
Cover dome 재질정보	S-3000(&6)(f1) min 1.8 mm

	PNM-9031RV
투명 Dome	S-3000(&6)(f1) min 1.8 mm
외부 Metal 사이에 있는 검정 plastic enclosure	QC-1220UR min 1.5 mm
내부 검정 plastic enclosure	HN-1068 min 1.5 mm
내부 은색 deco enclosure	HN-1068 min 1.5 mm Al+Sn 진공증착



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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-2025-02229
Page (19) / (27) pages

3.6.3 Parts List (3)

 Component - Plastics File Number: E115797		
LOTTE CHEMICAL CORPORATION 56 GOSAN-RO UIWANG-SI, GYEONGGI-DO 16073 Republic of Korea INFINO: HN-1068(+)(f1) Polycarbonate (PC), pellets (+) - May be replaced by one, two, or three numbers and/or letter(s) (f1) - Suitable for outdoor use with respect to exposure to Ultraviolet Light, Water Exposure and Immersion in accordance with UL 746C.		
		
Flammability	Value	Test Method
Flame Rating		UL 94
1.5 mm, ALL	V-0	IEC 60695-11-10, -20
3.0 mm, ALL	V-0	
Glow Wire Flammability Index		IEC 60695-2-12
1.5 mm	960 °C	
3.0 mm	960 °C	
Glow Wire Ignition Temperature		IEC 60695-2-13
1.5 mm	825 °C	
3.0 mm	825 °C	
Electrical	Value	Test Method
Hot-wire Ignition (HWI) (1.5 mm)	PLC 3	UL 746
High Amp Arc Ignition (HAI) (1.5 mm)	PLC 3	UL 746
Comparative Tracking Index (CTI)	PLC 3	UL 746
Dielectric Strength	32 kV/mm	ASTM D149
Volume Resistivity	1.0E+17 ohms-cm	ASTM D257 IEC 60093
Thermal	Value	Test Method
RTI Elec		UL 746
1.5 mm	130 °C	
3.0 mm	130 °C	
RTI Imp		UL 746
1.5 mm	130 °C	
3.0 mm	130 °C	
RTI Str		UL 746
1.5 mm	130 °C	
3.0 mm	130 °C	
Ball Pressure Test (130°C)	Pass	IEC 60695-10-2
Physical	Value	Test Method
Outdoor Suitability	f1	UL 746C



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Gyeonggi-do, Republic of Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

REPORT No.:
CTK-2025-02229
Page (20) / (27) pages

3.6.4 Parts List (4)

QMFZ2.E245303 - Plastics - Component

페이지 1 / 2



ONLINE CERTIFICATIONS DIRECTORY

QMFZ2.E245303 Plastics - Component

For enhanced search functionality, please visit UL's [QTM Family of Databases](#).
Click on a product designation for complete information.

[Page Bottom](#)

Plastics - Component

[See General Information for Plastics - Component](#)

KOMOTECH CO LTD
992-2 GUMSAN-RI
WAEGWAN-EUP
CHILGOK-GUN, KYOUNGSANGBUK-DO REPUBLIC OF KOREA

E245303

										H	D		
Material Dsg	Color	Min.	Flame	W	H	RTI		V	4	C			
		Thk		W	A	Elec	Mech	T	9	T			
		mm		Class	I	I	Imp	Str	R	S	I		
PET with silicone adhesive, furnished as sheets.													
JC-01(#)SN	GY	0.18-1.02	-	-	-	50	50	50	-	-	-	-	-
Silicone "Room Temperature Vulcanizing" (RTV), furnished as sheets.													
RM-2	NC	0.2 - 1.5	V-0	-	-	150	150	150	-	-	-	-	-
Silicone (SI), with adhesive, furnished as sheets.													
GP-1	NC	0.35	V-0	-	-	150	150	150	-	-	-	0	
		3.2	V-0	-	-	150	150	150					
TR-F	NC	0.35	V-0	-	-	150	150	150	-	-	-	0	
		3.2	V-0	-	-	150	150	150					
Silicone (SI), furnished as Sheet or Roll.													
SGP-Z	NC	2.0	V-0	-	-	105	105	105	-	-	-	-	-
		3.0	V-0	-	-	105	105	105					
Silicone (SI), furnished as sheets.													
SGEL COH-1307	NC	0.45	V-0	-	-	105	105	105	-	-	-	-	-
		1.0	V-0	-	-	105	105	105					
		3.0	V-0	-	-	105	105	105					
SGP-1	NC	0.2	V-0	-	-	105	105	105	-	-	-	-	-
		3.0	V-0	-	-	105	105	105					
TR-E	NC	0.5	V-1	-	-	150	150	150	-	-	-	-	-
		0.9	V-1	-	-	150	150	150					
		3.0	V-0	-	-	150	150	150					
TR-EA-1	NC	0.9	V-1	-	-	150	150	150	-	-	-	-	-
		3.0	V-0	-	-	150	150	150					
TR-EA-2	NC	0.9	V-0	-	-	150	150	150	-	-	-	-	-
		3.0	V-0	-	-	150	150	150					
TR-H	NC	1.8	V-1	-	-	150	150	150	-	-	-	-	-
		0.2-1.5	V-0	-	-	150	150	150					
TR-M	NC	0.4	V-0	-	-	150	150	150	-	-	-	-	-
		0.9	V-0	-	-	150	150	150					

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5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si,
Gyeonggi-do, Republic of Korea
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Fax: +82-31-624-9501

REPORT No.:
CTK-2025-02229
Page (21) / (27) pages

3.6.5 Parts List (5)



UL Certification

INFINO	Grade	QC-1220UR
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Component - Plastics

Grade Information

LOTTE ADVANCED MATERIALS CO LTD

56 Gyeon-ro, Gyeonggi-do Gyeonggi-do 427-711 KR

QC-122(+979)

Polycarbonate (PC) "INFINO", furnished as pellets

Color	Min. T _g (°C)	Class	UL94	HTI	HTI	HTI	HTI
ALL	1.6	V-2	3	6	136	125	125
	3.2	V-2	2	6	136	130	130

Comparative Tracking Index (CTI) II

Dielectric Strength (kV/mm)

High-Voltage Arc Tracking Rate (hVTR) 2

Dimensional Stability (%)

Incised Plane Tracking (PT) V₀

Volume Resistivity (10¹² ohm-cm) 10

High Volt. Low Current Arc Resist (DAR) 5

(+) - May be replaced by one, two, or three numbers and/or letters.

(V) - Subject to outdoor use with respect to exposure to ultraviolet light, water exposure and immersion in accordance with UL 746C

NOTES: All test results and data shall conform to testing methods, techniques and related standards. (NOTES: All test results and data shall conform to testing methods, techniques and related standards.)

Report Date: 2020-10-11

Last Revised: 2020-12-11

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IEC and ISO Test Methods

Test Name	Test Method	Units	Value
Flammability	IEC 60695-11-10	Class (color)	1.6 3.2 V-2 (ALL)
Slow-Wire Flammability (SWFI)	IEC 60695-2-12	°C	1.6 3.2 800
Slow-Wire Ignition (SWTI)	IEC 60695-2-13	°C	1.6 3.2 875
IEC Comparative Tracking Index	IEC 60112	Value (Max)	-
IEC Ball Pressure	IEC 60695-10-2	°C	-
ISO Heat Deflection (1.80 MPa)	ISO 75-2	°C	-
ISO Tensile Strength	ISO 527-2	MPa	-
ISO Flexural Strength	ISO 178	MPa	-
ISO Tensile Impact	ISO 6256	kJ/m ²	-
ISO Izod Impact	ISO 180	kJ/m ²	-
ISO Charpy Impact	ISO 179-2	kJ/m ²	-

Component - Plastics

Grade Information

LOTTE ADVANCED MATERIALS CO LTD

56 Gyeon-ro, Gyeonggi-do Gyeonggi-do 427-711 KR

QC-122(+)979

Polycarbonate (PC) "INFINO", furnished as pellets

Color	Min. T _g (°C)	Flame Class	UL94	UL94	UL94	UL94	UL94
NC	0.8	V-2	—	—	60	60	80
ALL	1.8	V-2	1	6	100	125	125
	3.2	V-2	2	6	100	130	130

Comparative Tracking Index (CTI) II

Dielectric Strength (kV/mm)

High-Voltage Arc Tracking Rate (hVTR) 2

Dimensional Stability (%)

Incised Plane Tracking (PT) V₀

Volume Resistivity (10¹² ohm-cm) 10

High Volt. Low Current Arc Resist (DAR) 5

(+) - May be replaced by one, two, or three numbers and/or letters.

(V) - Subject to outdoor use with respect to exposure to ultraviolet light, water exposure and immersion in accordance with UL 746C, where the acceptability for outdoor use is to be determined by UL.

NOTES: All test results and data shall conform to testing methods, techniques and related standards. (NOTES: All test results and data shall conform to testing methods, techniques and related standards.)

Report Date: 2020-10-11

Last Revised: 2020-12-11

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UL and ISO Test Methods

Test Name	Test Method	Units	Value (min)	Value
Flammability	IEC 60695-11-10	Class (color)	0.8	V-2 (NC)
			1.6	V-2 (ALL)
			3.2	V-2 (ALL)
Slow-Wire Flammability (SWFI)	IEC 60695-2-12	°C	1.6	800
			3.2	800
Slow-Wire Ignition (SWTI)	IEC 60695-2-13	°C	1.6	800
			3.2	875
IEC Comparative Tracking Index	IEC 60112	Value (Max)	—	—
IEC Ball Pressure	IEC 60695-10-2	°C	—	—
ISO Heat Deflection (1.80 MPa)	ISO 75-2	°C	—	—
ISO Tensile Strength	ISO 527-2	MPa	—	—
ISO Flexural Strength	ISO 178	MPa	—	—
ISO Tensile Impact	ISO 6256	kJ/m ²	—	—
ISO Izod Impact	ISO 180	kJ/m ²	—	—
ISO Charpy Impact	ISO 179-2	kJ/m ²	—	—



CTK Co., Ltd.

5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si,
Gyeonggi-do, Republic of Korea
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REPORT No. :
CTK-2025-02229
Page (22) / (27) pages

3.6.6 Parts List (6)

Component - Plastics

E41179

MITSUBISHI ENGINEERING PLASTICS CORP

ENVIRONMENT & QUALITY ASSURANCE DEPT., DIV. 1, SHODOME SUMITOMO-BLDG 25TH FL., 1-8-2 HOASHI-SHINBASHI, MINATO-KU TOKYO 105-0021 JF

S-2000V+(F1), S-2001V+(F1), S-2003V+(F1)

Polycarbonate (PC), unreinforced, furnished as pellets

Color	Min Thk (mm)	Flame Class	HMM	HAI	RTI Elec	RTI Imp	RTI Str
ALL	0.38	V-2	-	-	80	80	80
	1.5	V-2	3	0	125	115	125
	3.0	V-2	3	0	125	115	125

Comparative Tracking Index (CTI): 2

Inclined Plane Tracking (IPT): -

Dielectric Strength (kV/mm): 20

Volume Resistivity (10⁹ ohm-cm): 7

High-Voltage Arc Tracking Rate (HVTIR): 0

High Volt., Low Current Arc Resis (D495): 5

Dimensional Stability (%): 0

(F1) - Suitable for outdoor use with respect to exposure to Ultraviolet Light, Water Exposure and Immersion in accordance with UL 746C.

+ - Suffix optional, exceptions: The following cannot be used as optional suffixes: "T" for grade 2038, "A" for 1581, 1582, 1511, 1521 & 2582, "B" for NKG5858, NKG5838, NKG5581, & CGF-(v)(u), "S1" for F20-54.

ASTM/UL 94 small-scale test data does not pertain to building materials, furnishings and related contents. ASTM/UL 94 small-scale test data is intended solely for determining the flammability of plastic materials used in the components and parts of end-product devices and appliances, where the acceptability of the combination is determined by UL.

Report Date: 1992-10-01

Last Revised: 2004-03-23

Underwriters Laboratories Inc®

IEC and ISO Test Methods

Test Name	Test Method	Units	Thickness Tested (mm)	Value
Flammability	IEC 60695-11-10	Class (color)	8.38	V-2 (ALL)
			1.5	V-2 (ALL)
			3.8	V-2 (ALL)
Glow-Wire Flammability (GWFI)	IEC 60695-2-12	C	-	-
Glow-Wire Ignition (GWIT)	IEC 60695-2-13	C	-	-
IEC Comparative Tracking Index	IEC 60112	Volts (Max)	-	-
IEC Ball Pressure	IEC 60695-10-2	C	-	-
ISO Heat Deflection (1.88 MPa)	ISO 75-2	C	-	-
ISO Tensile Strength	ISO 527-2	MPa	-	-
ISO Flexural Strength	ISO 178	MPa	-	-
ISO Tensile Impact	ISO 8256	kJ/m ²	-	-
ISO Izod Impact	ISO 188	kJ/m ²	-	-
ISO Charpy Impact	ISO 179-2	kJ/m ²	-	-

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Gyeonggi-do, Republic of Korea
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REPORT No. :
CTK-2025-02229
Page (23) / (27) pages

4. Hose Down Test (Clause 5.7)

4.1 Test date and environmental conditions

4.1.1 Test date: May. 17, 2025~ May. 24, 2025

4.1.2 Measured Environmental Conditions

Item	Temperature (°C)	Humidity (% R.H.)	Pressure (kPa)
Measurement	24.2	52.5	101.1

4.2 Test Conditions and methods

4.2.1 Description of Test

The enclosure and its external mechanisms were subjected to a stream of water from a hose that has a 25.4 mm (1 in) inside diameter nozzle and delivers at least 240 L (65 gal) per minute. The nozzle was held from 3.0 to 3.5 m (10 to 12 feet) from the enclosure, and the spray of water was directed at all points of potential water entry such as seams, joints, external operating mechanisms, and such. The nozzle was moved along each test point one time at a uniform rate of 6 mm/sec (1/4 in/sec).

4.2.2 Sample Dimension

Ø 132.4 mm by 415.7 mm, Ø 253 mm by 794.4 mm, Ø 10 mm by 314 mm, Ø 25 mm by 78.5 mm

Test Duration = 224.77 secs

4.2.3 Acceptance conditions

The enclosure shall be considered to have met the requirements if at the conclusion of the test no water has entered the enclosure



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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-2025-02229
Page (24) / (27) pages

4.3 Attachment 3 - Photographs

4.3.1 Hose down test



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Gyeonggi-do, Republic of Korea
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REPORT No.:
CTK-2025-02229
Page (25) / (27) pages

4.4 Test result**4.4.1 Test result table**

Sample No (Model)	Water Flow	Presence of water inside	Result
PNM-9031RV	240 LPM	No	Normal

※ Refer to the product photos after the completion of testing in section 4.5.



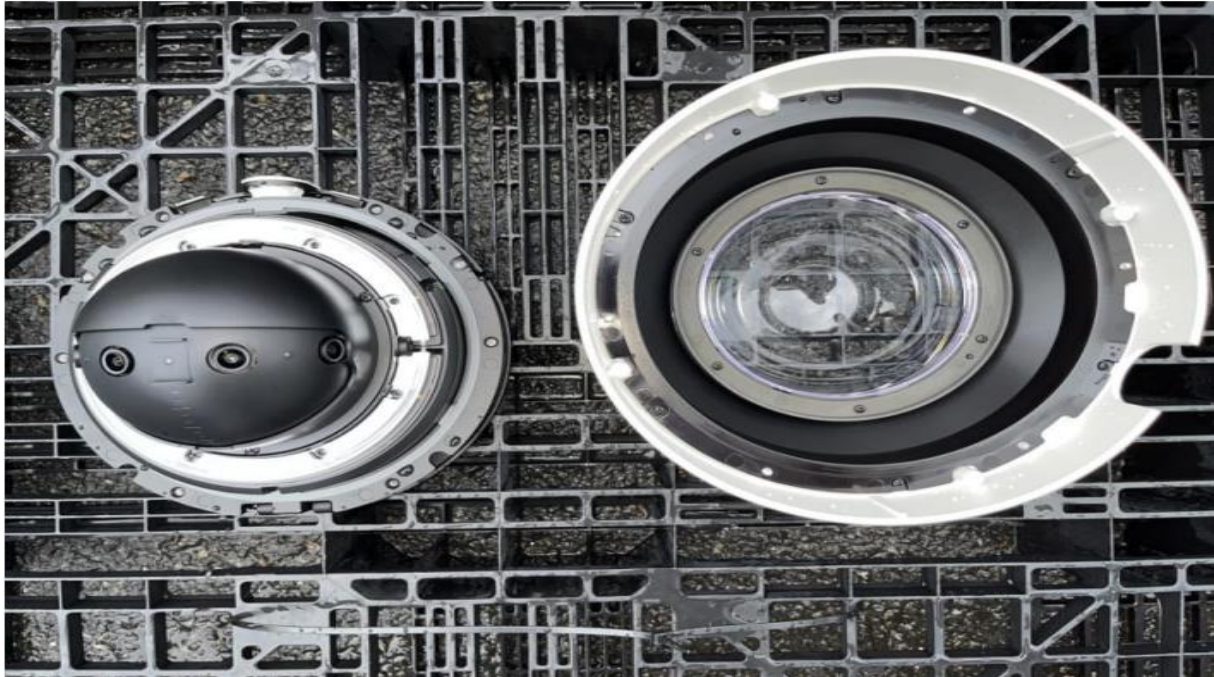
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Gyeonggi-do, Republic of Korea
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REPORT No.:
CTK-2025-02229
Page (26) / (27) pages

4.5 Post-test product images

4.5.1 Test sample image (1)





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REPORT No.:
CTK-2025-02229
Page (27) / (27) pages

4.5.2 Test sample image (2)



- End -