

TEST REPORT

 CTK Co., Ltd. The Power Leader of Global Regulatory Certification	CTK Co., Ltd. 5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Republic of Korea Tel: +82-31-339-9970 Fax: +82-31-624-9501	Report No.: CTK-2024-01386 Page (1) / (26) pages	
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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 : 2024-04-03

2. Manufacturer

◦ Name : HANWHA VISION VIETNAM COMPANY LIMITED
◦ Address : Lot O-2, Que Vo Industrial Zone extended area, Nam Son
ward, Bac Ninh city, Bac Ninh province, Vietnam

3. Use of Report : Quality control

4. Test sample / Model : NETWORK CAMERA / PNM-C32084RQZ

5. Date(s) of test : 2024-04-19 to 2024-04-26

6. Location of Test : ☒ Permanent Testing Lab ☐ On Site Testing

Address: (5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Republic of Korea)

7. Test Standard (Method) used : NEMA 250-2014

Enclosures for Electrical Equipment (1000 Volts
Maximum)

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

Pressure: (96 ±10) kPa

9. Test Results : Refer to each test items

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
This Test Report cannot be reproduced, except in full.

The test was conducted as one sample, and the test result does not depend on the number of
samples

Affirmation	Tested by HyungUk Jeon  (Signature)	Technical Manager HoHyun Lee  (Signature)
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2024-05-10

CTK Co., Ltd



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Test item description.....:	NETWORK CAMERA
Trade Mark.....:	Hanwha Vision
Manufacturer	Lot O-2, Que Vo Industrial Zone extended area, Nam Son commune, Bac Ninh city, Bac Ninh province, Vietnam
Model/Type reference.....:	PNM-C32084RQZ
Ratings.....:	Electrical PoE (55 V  1.29 A) Dimension: Ø 315 mm by 989.1 mm, Ø 265 mm by 832.1 mm, Ø 210 mm by 659.4 mm, Ø 25 mm by 78.5 mm, Ø 7.5 *6 mm by 141.3 mm, Ø 5 *4 mm by 62.8 mm

List of Attachments (including a total number of pages in each attachment): Attachment 1: 11-15 pages (Construction Diagram including installation method) Attachment 2: 16-21 pages (Parts List) Attachment 3: 22-26 pages (photographs)	
Summary of testing:	
Tests performed (name of test and test clause): Clause 5.7(Hose Down Test)	Testing location: CTK Co., Ltd. 5 Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Republic of Korea

Copy of marking plate: The artwork above may be only a draft.	
 NETWORK CAMERA,PNM-C32084RQZ PoE(55V ) 1.29A M/C: PNM-C32084RQZ/KEX Fac.ID:D  2024.05 S/N:Serial No. MAC ADDRESS: XX-XX-XX-XX-XX-XX CAN ICES-3(A)/NMB-3(A) HANWHA VISION CO.,LTD. MADE IN KOREA Rainproof/ Étanche IP66	

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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 evaluated to the test object :	N/E

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 city, Bac Ninh province, Vietnam
2. D-TECH CO., LTD. 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi-do, Korea (Suwon Industrial Complex)
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).

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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NEMA 250-2014			
Clause	Requirement + Test	Result - Remark	Verdict

3	CONSTRUCTION		
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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	No Knockouts	N/A
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
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		
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NEMA 250-2014			
Clause	Requirement + Test	Result - Remark	Verdict
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	
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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
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

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NEMA 250-2014			
Clause	Requirement + Test	Result - Remark	Verdict
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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NEMA 250-2014			
Clause	Requirement + Test	Result - Remark	Verdict

Test Information

	Hose Down Test: Clause 5.7	P
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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).

Sample Dimension

Ø 315 mm by 989.1 mm, Ø 265 mm by 832.1 mm,

Ø 210 mm by 659.4 mm, Ø 25 mm by 78.5 mm,

Ø 7.5 *6 mm by 141.3 mm, Ø 5 *4 mm by 62.8 mm

Test Duration = 460.53 secs

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

Test Results

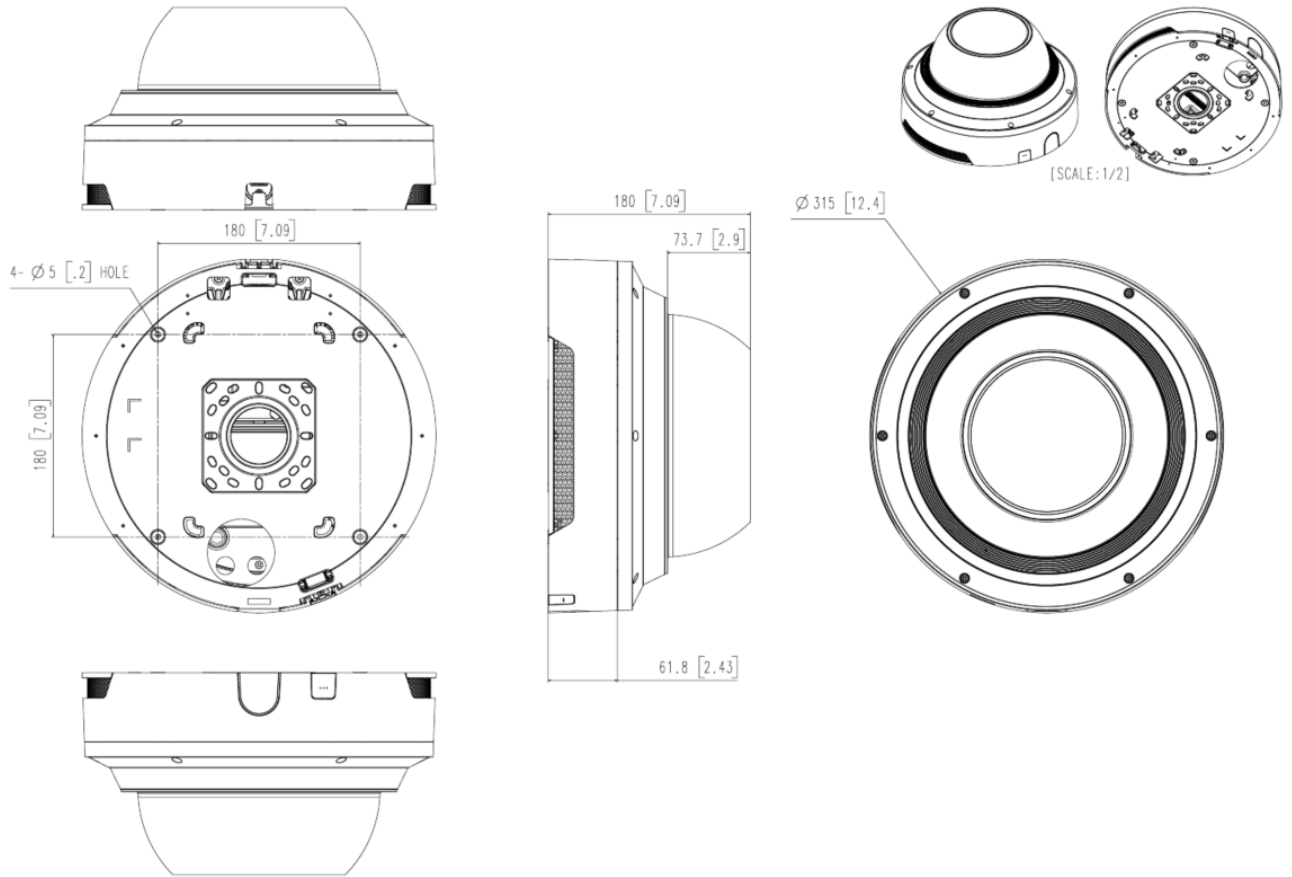
Sample No (Model)	Water Flow	Presence of water inside	Result
PNM-C32084RQZ	240 LPM	No	Pass

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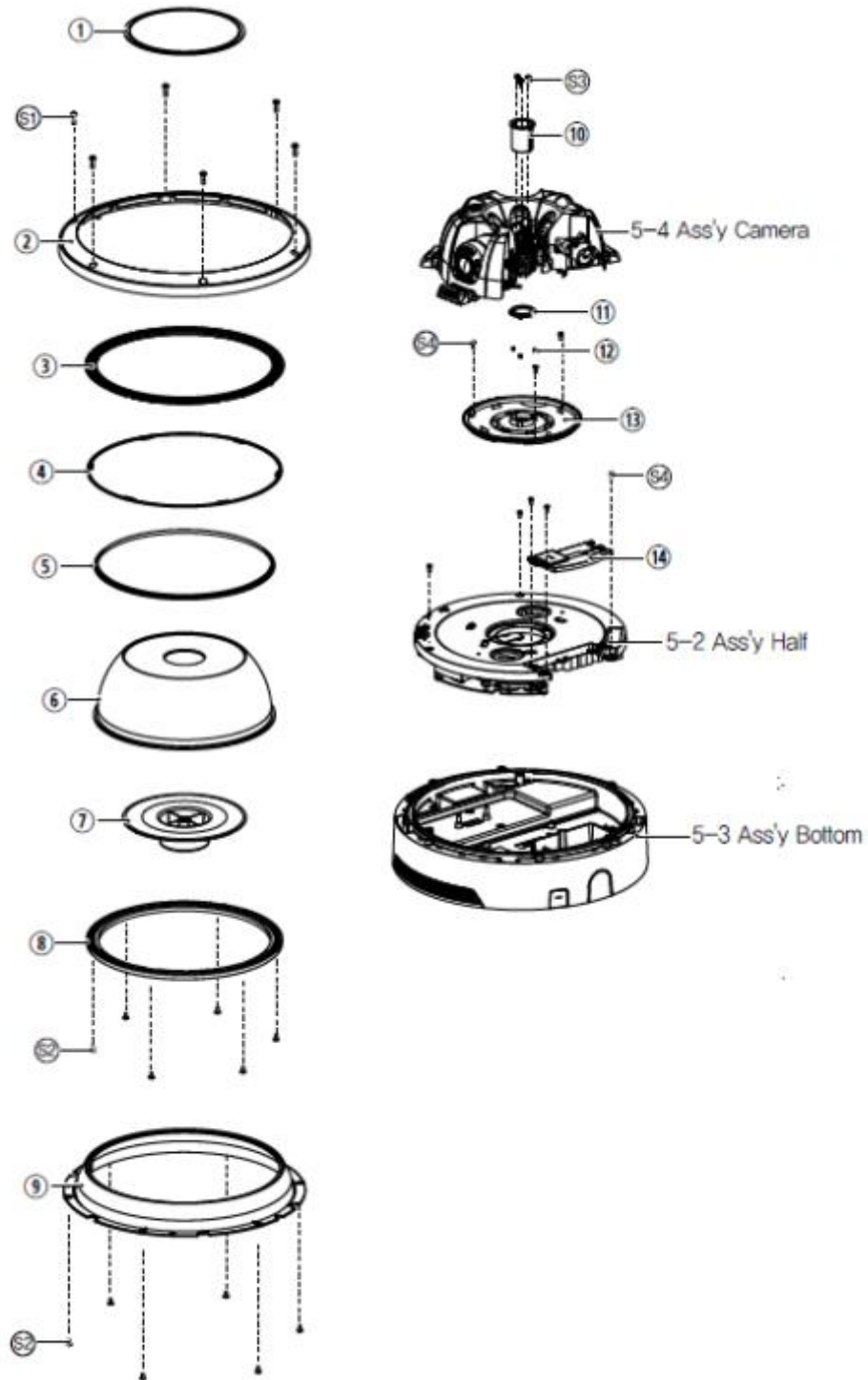
List of test equipment used:

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	2024.01.23	2026.01.23
C-S1-D09	Steel Measuring Tape	5 m	KOMELON/KMC-74N	2023.02.02	2025.02.02
S3-IP23	Water flow meter	250LPM	Nuri tech/ Z-6504	2024.02.28	2025.02.28
C-S1-D02	DIGITAL VERNIER CALIPER	150 mm	MITUTOYO/150 mm	2023.07.31	2024.07.31

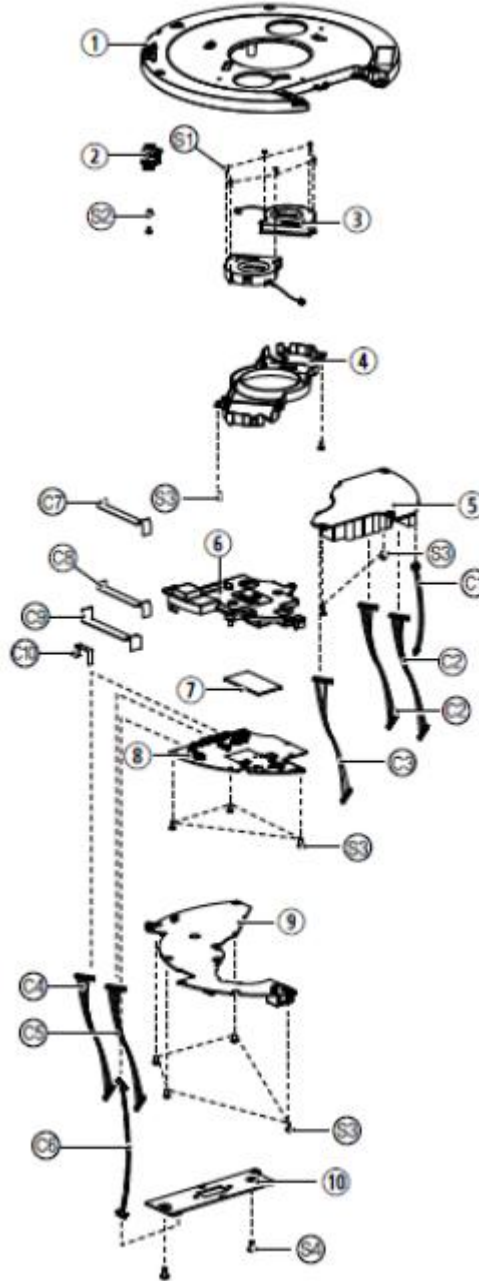
Attachment 1 – Construction Diagram and installation method



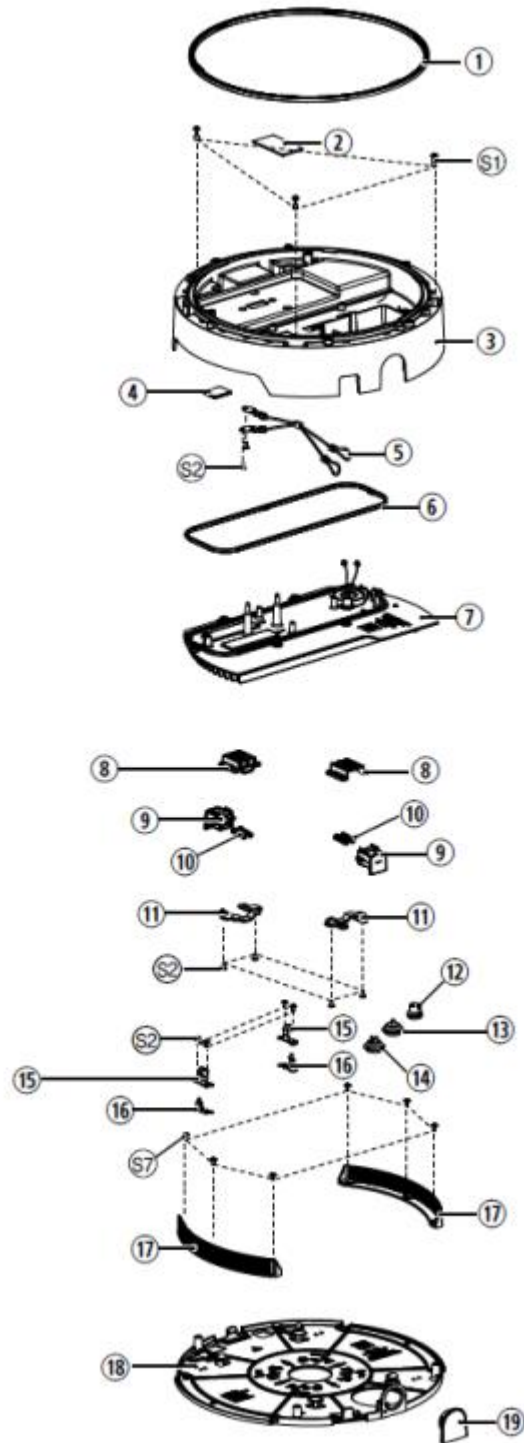
Attachment 1 – Construction Diagram and installation method



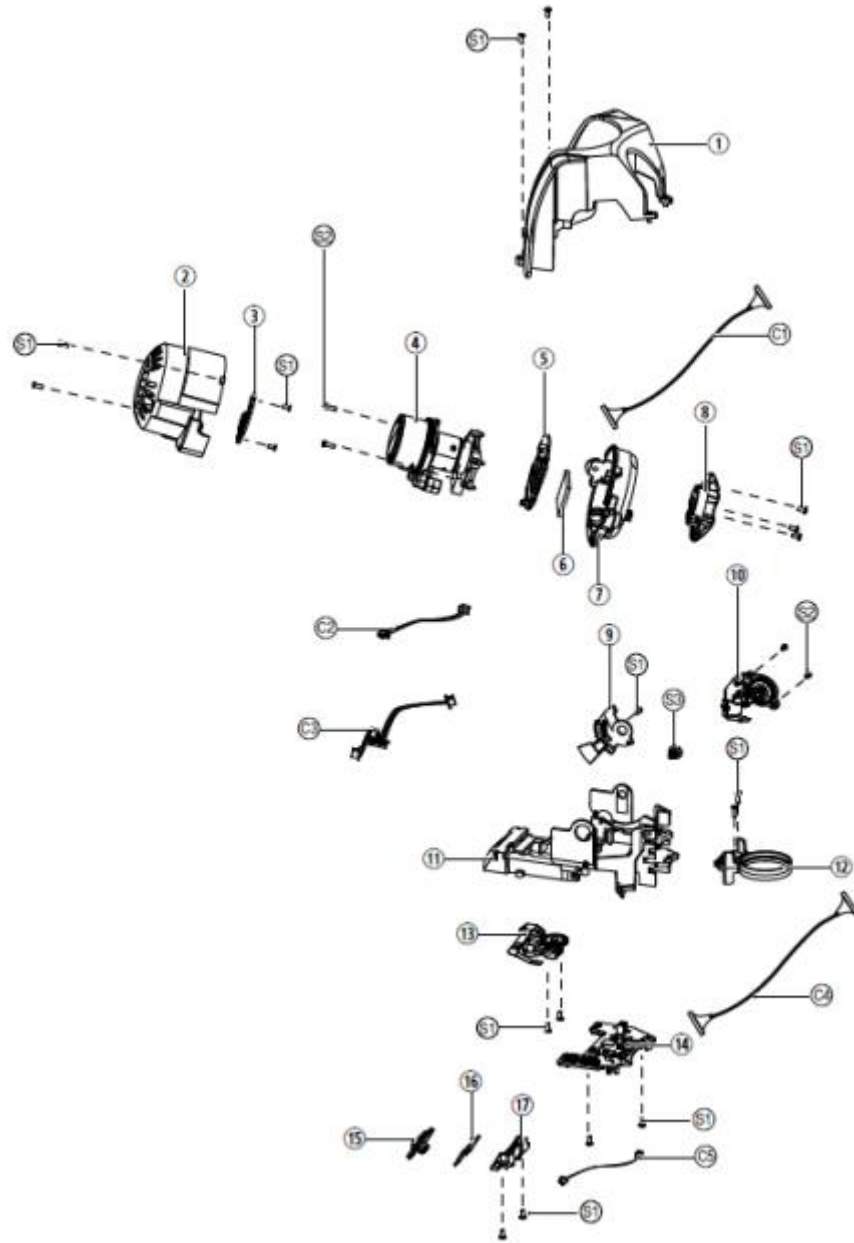
Attachment 1 – Construction Diagram and installation method



Attachment 1 – Construction Diagram and installation method



Attachment 1 – Construction Diagram and installation method





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Attachment 2 – Parts List

부품위치	부품번호	품명	수량	공급여부	비고
1	FC15-007194A	COVER-TOP_DECO_PNM-9084RQZ;PC,BLACK	1	SA	
2	FC29-017000A	CASE-TOP_PNM-C32084RQZ	1	SA	
3	FC29-016999A	CASE-DOME_PNM-C32084RQZ	1	SA	
4	HP07-001464A	GASKET-IR_PNM-9084RQZ;SILICON	1	SA	
5	HP07-001466A	GASKET-DOME_PNM-9084RQZ;SILICON	1	SA	
6	FC15-007199C	COVER-GLASS_PNM-9084RQZ;PC,HARD-COATED	1	SA	
7	FC15-010508A	COVER-GHOST_PNM-C32084RQZ	1	SA	
8	FC09-010688A	BRACKET-IR_PNM-9084RQZ;ADC12	1	SA	
9	FC15-010510A	COVER-IR_PNM-C32084RQZ	1	SA	
10	MC19-004028A	SHAFT-PAN 32083RQZ	1	SA	
11	FC15-007117A	COVER-SPRING-9084;MOLD	1	SA	
12	FC38-001167A	SPRING,COM-6085;SUS304WPB	3	SA	
13	MC11-006857A	GEAR,PAN-32083RQZ;MD	1	SA	
14	FC15-010511A	COVER-OUTPUT_CABLE_PNM-C32083RQZ	1	SA	
S1	FC18-004000A	SCREW-SPECIAL PH,TR20,M4,L12+5,SUS,FP	6	SA	
S2	Z6001047201A	SCREW-MACHINE:TH,+,M3,L6,SUS	12	SA	
S3	Z6003013801A	SCREW-TAPTITE BH,+,M3,L8,BLK,B-TYPE	3	SA	
S4	Z9642306007	SCREW-MACHINE:PH,+,M3,L6,BLK,FP	8	SA	

부품위치	부품번호	품명	수량	공급여부	비고
1	FC39-007645A	FRAME_BODY_PNM-C32084RQZ	1	SA	
2	AM08-011345A	ASSY,PCB-PNM-C32083RQZ SD	1	SA	
3	EP07-004226	FAN,ELECTRIC-EF50101BX;0.192A,-10~70	2	SA	
4	FC15-010512A	COVER_DUCT_PNM-C32083RQZ	1	SA	
5	EP08-005922A	SUPPLY,POWER,ETC-PNM-C32084RQZ;HPOE,12V,	1	SA	
6	EP07-002012A	SINK,HEAT_CV5_PNM-C32083RQZ	1	SA	
7	FC29-003541A	PAD_THERMAL_54*30*2_7.0	1	SA	
8	AM08-011355A	ASSY,PCB-PNM-C32084RQZ MAIN	1	SA	
9	AM08-011339A	ASSY,PCB-PNM-C32083RQZ SUB	1	SA	
10	AM08-011359A	ASSY,PCB-PNM-C32084RQZ CONNECTOR	1	SA	
S1	Z6003019601A	SCREW-TAPTYPE ,M2,L6 ,BLK,FP	6	SA	
S2	Z6001055901A	SCREW-TAPTYPE ,M3,L4 ,BLK,FP	2	SA	
S3	Z9642306007	SCREW-MACHINE:PH,+,M3,L6,BLK,FP	11	SA	
S4	FC18-006594A	SCREW_ETC_SHOULDER M3	2	SA	
C1	EP02-005318A	HARNESS-KNP-C9310R;WIRE,4P,4P,160MM	1	SA	
C2	EP02-005421A	HARNESS--HOUSING-TERMINAL,1:1,WIRE,15P-	2	SA	
C3	EP02-005420A	HARNESS--HOUSING-TERMINAL,1:1,WIRE,8P-8	1	SA	
C4	EP02-005424A	CABLE-PNM-C32083RQZ;1:1,FFC,20P,-,110MM/	1	SA	
C5	EP16-003681A	FPCB-PNM-C32084RQZ;MAIN TO SD,PI,2L,0.3,	1	SA	
C6	EP02-005419A	HARNESS--HOUSING-TERMINAL,1:1,WIRE,14P-	1	SA	
C7	EP16-003680A	FPCB-PNM-C32084RQZ;MAIN TO CONNECTOR,PI,	1	SA	
C8	EP02-005417A	HARNESS--HOUSING-TERMINAL,1:1,WIRE,8,9P	1	SA	
C9	EP02-005418A	HARNESS--HOUSING-TERMINAL,1:1,WIRE,12P-	1	SA	
C10	EP02-005423A	HARNESS--HOUSING-TERMINAL,1:1,WIRE,8P-8	1	SA	



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Attachment 2 – Parts List

부품위치	부품번호	품명	수량	공급여부	비고
1	HP07-001898A	GASKET-BOTTOM_PNM-C32083RQZ	1		
2	FC28-003541A	PAD_THERMAL_54*30*2_7.0	1	SA	
3	FC29-017001A	CASE-BOTTOM_PNM-C32084RQZ	1	SA	
4	FC28-004006A	PAD-THERMAL_PET_25*21*2;7W/M-K	1	SA	
5	EP24-001020A	WIRE-SAFETY_PNM-C32084RQZ,SUS	1	SA	
6	HP07-001897A	GASKET,NVIDIA_PNM-C32084RQZ	1	SA	
7	FC15-010516A	COVER,NVIDIA_PNM-C32084RQZ	1	SA	
8	FC09-016574A	BRACKET,SWITCH-BTM_PNM-C32083RQZ	2	SA	
9	FC29-016993A	HOLDER,SWITCH-BTM_PNM-C32083RQZ	2	SA	
10	FC38-001373A	SPRING,ETC-SWITCH-BTM_PNM-C32083RQZ,SUS304	4	SA	
11	FC15-010514A	COVER,SWITCH-BTM_PNM-C32083RQZ	2	SA	
12	HP08-001187	VENT-GORE-PMF100585,MEMBRANE,SCREW IN,PM	1	SA	
13	MC08-001082A	BUSHING-CABLE FLEXIBLE,SILICON,GRAY	1	SA	
14	MC08-001042A	BUSHING-CABLE SET,SILICON,PNV-9080R	1	SA	
15	FC29-015085A	HOLDER-SAFETY_WIRE,PD,1.5,SUS304	2	SA	
16	FC38-001316A	SPRING,PLT-SAFETY_WIRE_9084RQZ,SUS304CSP	2	SA	
17	FC09-016629A	BRACKET-MESH_PNM-C32083RQZ,PC	1	SA	
18	FC39-007646A	MOUNT,PLATE_PNM-C32083RQZ	1	SA	
19	FC15-009322A	COVER-CONDUIT_PNM-C32083RVQ,PC,CONDUIT_HOL	1	SA	
S1	FC18-004000A	SCREW-SPECIAL-PH,TR20,M4,L12+5,SUS,FP	3	SA	
S2	Z6001047201A	SCREW-MACHINE:TH,+,M3,L6,SUS	16	SA	

부품위치	부품번호	품명	수량	공급여부	비고
1	FC15-010507A	COVER-IR 32083RQZ,MD	1	SA	
2	FC15-010504A	COVER-FRONT 32083RQZ,MD	1	SA	
3	AM06-011349A	ASSY,PCB-PNM-C32083RQZ CDS	1	SA	
4	EP14-001289	LENS SET YT30033DB IR 8MP	1	SA	
5	AM06-011338A	ASSY,PCB-PNM-C32083RQZ SENSOR	1	SA	
6	FC28-003715A	Thermal Pad	1	SA	
7	AM03-060864A	ASSY COVER GEAR ROTATE C32084RQZ	1	SA	
8	EP07-002009A	SINK HEAT SENSOR 32083RQZ	1	SA	
9	MC11-006856A	GEAR TILT 32083RQZ	1	SA	
10	AM07-017169A	ASSY TILT C32083RQZ	1	SA	
11	FC15-010505A	COVER BASE32083RQZ	1	SA	
12	FC15-010506A	COVER HOLDER PAN 32083RQZ	1	SA	
13	AM07-017171A	ASSY PAN C32083RQZ	1	SA	
14	AM06-011353A	ASSY,PCB-PNM-C32083RQZ INTERFACE	1	SA	
15	AM06-011347A	ASSY PCB PNM-C32083RQZ IR	1	SA	
16	FC28-003923A	Thermal Pad IR	1	SA	
17	EP07-002010A	SINK HEAT IR 32083RQZ	1	SA	
C1	EP02-005414A	CABLE PNM C32083RQZ MCX 40P	1	SA	
C2	EP02-005211A	HARNESS 5P	1	SA	
C3	EP02-004376A	HARNESS 4P 55MM	1	SA	
C4	EP02-005410A	CABLE PNM C32083RQZ MCX 30P	1	SA	
C5	EP02-005422A	HARNESS 2P	1	SA	
S1	Z6003019601A	SCREW-TAPTITE-PH,+,M2,L6,BLK,B-TYPE	11	SA	
S2	Z6003020401A	SCREW-TAPTITE-CH,+,M1.7,L4,BLK,B-TYPE	4	SA	
S3	FC18-004952A	SCREW SPECIAL TT M3	1	SA	

Attachment 2 – Parts List

UL 인증 | 롯데첨단소재

INFINO

Grade

NH-1035

iq.ul.com

Component - Plastics [\[guide info\]](#)

E115797

Lotte Advanced Materials Co Ltd

56 Gosan-ro, Uiwang-si Gyeonggi-do 437-711 KR

NH-1035(+)

Polycarbonate (PC), "INFINO", furnished as pellets

Color	Min Thk (mm)	Flame Class	HWI	HAI	RTI Elec	RTI Imp	RTI Str
ALL	1.5	V-0	-	-	80	80	80
	2.0-2.7	V-0, 5VB	-	-	80	80	80

Comparative Tracking Index (CTI): -

Dielectric Strength (kV/mm): -

High-Voltage Arc Tracking Rate (HVTR): -

Dimensional Stability (%): -

Inclined Plane Tracking (IPT): -

Volume Resistivity (10⁸ ohm-cm): -

High Volt, Low Current Arc Resis (D495): -

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

ANSI/UL 94 small-scale test data does not pertain to building materials, furnishings and related contents. ANSI/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: 1998-08-24

Last Revised: 2008-02-15

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IEC and ISO Test Methods

Test Name	Test Method	Units	Thk (mm)	Value
Flammability	IEC 60695-11-10, IEC 60695-11-20	Class (color)	1.5	V-0 (ALL)
			2.0-2.7	V-0, 5VB (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 (1.80 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 180	kJ/m ²	-	-
ISO Charpy Impact	ISO 179-2	kJ/m ²	-	-

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Attachment 2 – Parts List

	Component - Plastics	Yellow Card™
	S-2000V+(f1), S-2001V+(f1)	

mitsubishi engineering-plastics corp

File Number: E41179

ENVIRONMENT & QUALITY ASSURANCE DEPT
SHIODOME SUMITOMO-BLDG 25TH FL
1-9-2 HIGASHI-SHINBASHI
MINATO-KU, TOKYO 105-0021 Japan

S-2000V+(f1), S-2001V+(f1)

Polycarbonate (PC), unreinforced, pellets

(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: "NF" for grade NXG5050, "N" for grade NXG5030, "N" for grade MB2112+, "S1" for grade F20-54, "V" for grades S-2000+(f1), S-2001+(f1), S-2003+(f1), the last letter "L" for grade CFH2520+, "W" for ELV2010 included in Grade ELV20(a5)+, "V" for grade MB2210+.



Flammability	Value	Test Method
Flame Rating		UL 94
0.38 mm, ALL	V-2	IEC 60695-11-10, -20
1.5 mm, ALL	V-2	
3.0 mm, ALL	V-2	
Electrical	Value	Test Method
Hot-wire Ignition (HWI)		UL 746A
1.5 mm	PLC 3	
3.0 mm	PLC 3	
High Amp Arc Ignition (HAI)		UL 746A
1.5 mm	PLC 0	
3.0 mm	PLC 0	
Comparative Tracking Index (CTI)	PLC 2	UL 746A
Dielectric Strength	20 kV/mm	ASTM D149
High Voltage Arc Tracking Rate (HVTR)	PLC 0	UL 746A
Volume Resistivity	1.0E+7 ohms-cm	ASTM D257 IEC 60093
Arc Resistance	PLC 5	ASTM D495



CTK Co., Ltd.

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Attachment 2 – Parts List



Component - Plastics

File Number: E115797

LOTTE CHEMICAL CORPORATION
56 GOSAN-RO
UIWANG-SI, GYEONGGI-DO 16073 Republic of Korea



INFINO: QC-122(+)(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
1.6 mm, ALL	V-2	IEC 60695-11-10, -20
3.2 mm, ALL	V-2	
Glow Wire Flammability Index		IEC 60695-2-12
1.6 mm	850 °C	IEC 60695-2-13
3.2 mm	850 °C	
Glow Wire Ignition Temperature		
1.6 mm	900 °C	IEC 60695-2-13
3.2 mm	875 °C	
Electrical	Value	Test Method
Hot-wire Ignition (HWI)		UL 746
1.6 mm	PLC 3	UL 746
3.2 mm	PLC 2	
High Amp Arc Ignition (HAI)		UL 746
1.6 mm	PLC 0	UL 746
3.2 mm	PLC 0	
Comparative Tracking Index (CTI)	PLC 0	UL 746
High Voltage Arc Tracking Rate (HVTR)	PLC 2	UL 746
Volume Resistivity	1.0E+16 ohms-cm	ASTM D257 IEC 60093
Arc Resistance	PLC 5	ASTM D495
Thermal	Value	Test Method
RTI Elec		UL 746
1.6 mm	130 °C	UL 746
3.2 mm	130 °C	
RTI Imp		UL 746
1.6 mm	125 °C	UL 746
3.2 mm	130 °C	
RTI Str		UL 746
1.6 mm	125 °C	UL 746
3.2 mm	130 °C	
Physical	Value	Test Method
Outdoor Suitability	f1	UL 746C

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Attachment 2 – Parts List

 Component - Plastics HN-1068(+)(f1) Yellow Card™		
LOTTE CHEMICAL CORPORATION 56 GOSAN-RO UIWANG-SI, GYEONGGI-DO 16073 Republic of Korea		File Number: E115797
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 746A
High Amp Arc Ignition (HAI) (1.5 mm)	PLC 3	UL 746A
Comparative Tracking Index (CTI)	PLC 3	UL 746A
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 746B
1.5 mm	130 °C	
3.0 mm	130 °C	
RTI Imp		UL 746B
1.5 mm	130 °C	
3.0 mm	130 °C	
RTI Str		UL 746B
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

Attachment 3 – Photographs

Test Unit



Front



Rear



Left side



Right side



Top



Bottom



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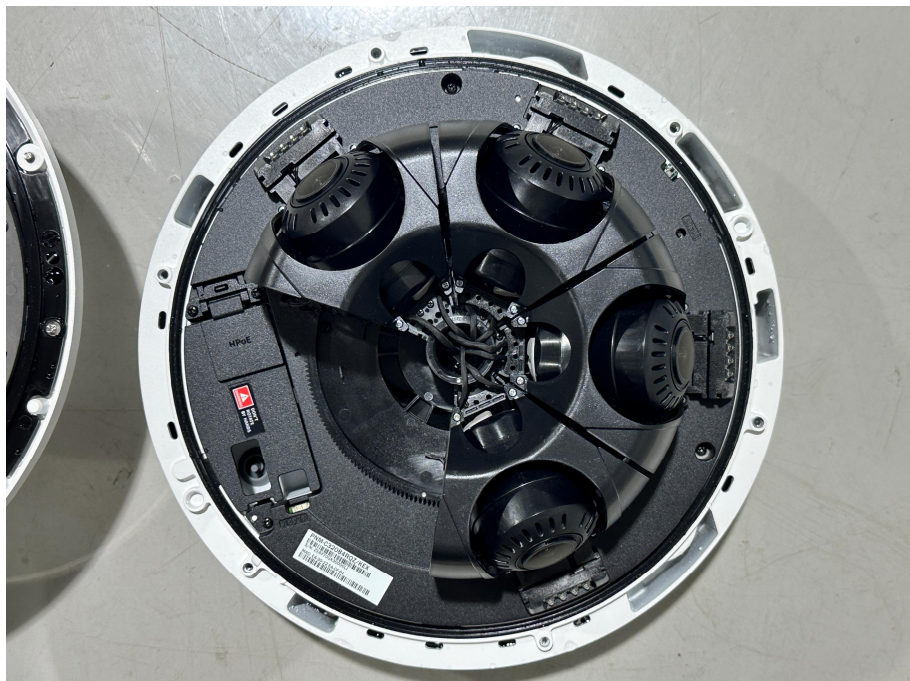
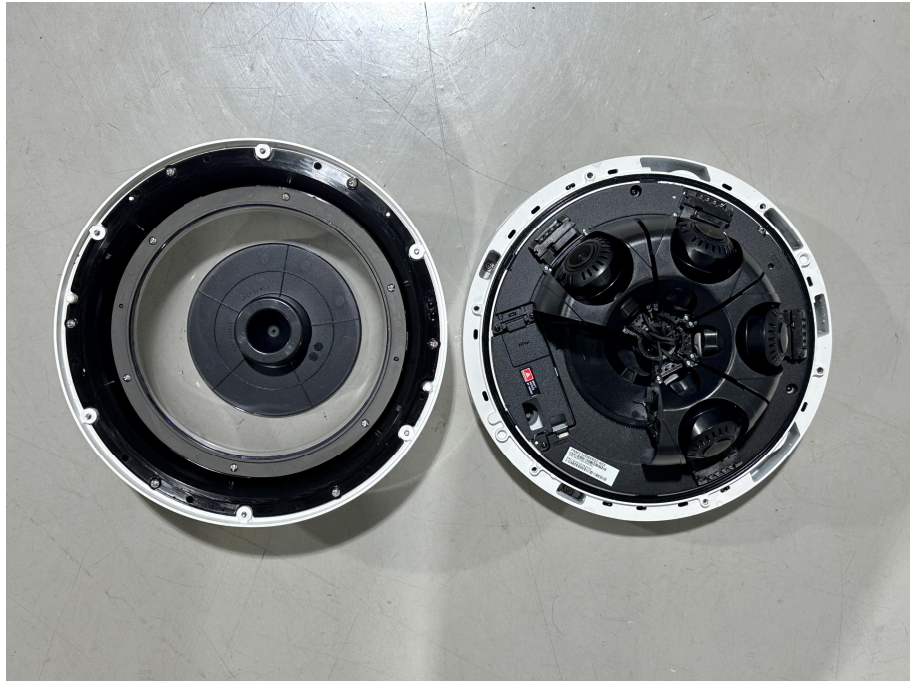
Attachment 3 – Photographs

Hose down test



Attachment 3 – Photographs

Test Result





CTK Co., Ltd.

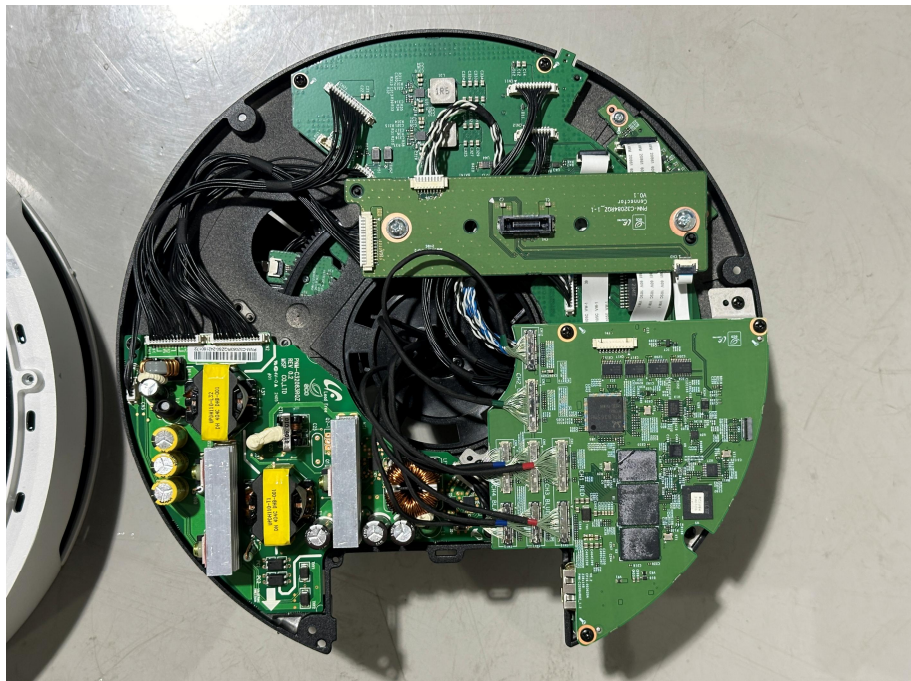
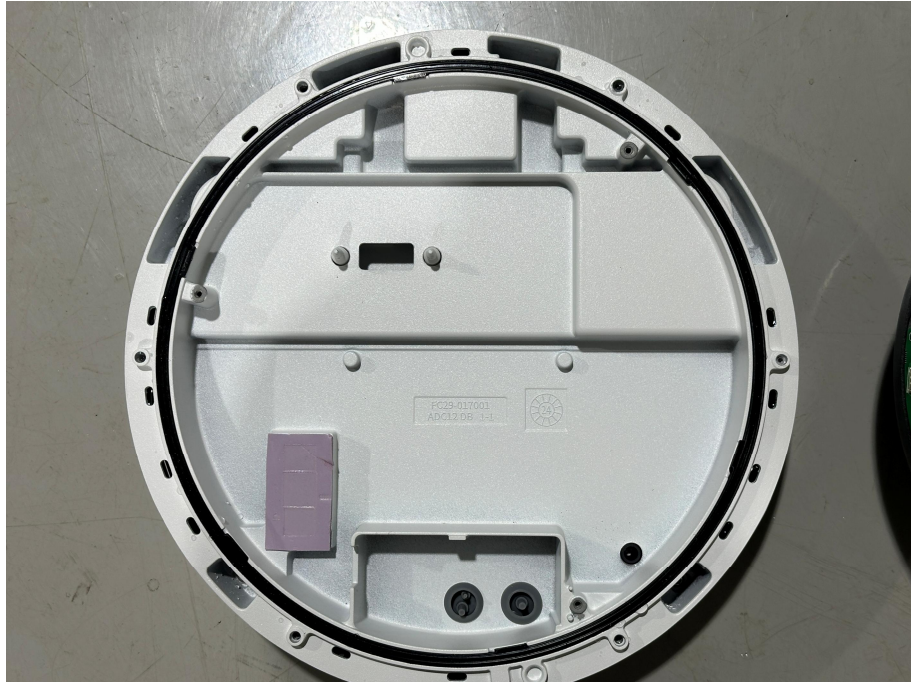
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Attachment 3 – Photographs



Attachment 3 – Photographs



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