

TEST REPORT

 CTK Co., Ltd. The Prime Leader of Global Regulatory Certification	CTK Co., Ltd. (Ho-dong) 113, Yejik-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, KOREA, REPUBLIC OF Tel: +82-31-339-9970 Fax: +82-31-624-9501	Report No.: CTK-2020-03117 Page(1) / (22) Pages	
---	---	--	--

1. Applicant

- Name: Hanwha Techwin Co., Ltd.
- Address.....: Hanwha Techwin R&D center, 6 Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, 13488 KOREA
- Date of Receipt.....: 2020-06-18

2. Manufacturer

- Name: Hanwha Techwin Co., Ltd.

3. Use of Report: Quality control

4. Test sample / Model: NETWORK CAMERA / XNF-9010RV

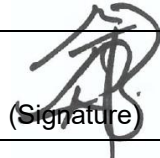
5. Date(s) of test: 2020-06-18 - 2020-06-26

NEMA 250-2014

6. Test Standard (Method) used....: Enclosures for Electrical Equipment (1000 Volts Maximum)

7. Results: Pass

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.
 This report shall not be reproduced except in full without the written approval of CTK

Approval	Tested by: SooChan Bae  (Signature)	Technical Manager: YenHwang Jung  (Signature)
----------	---	---

2020-08-06

CTK Co., Ltd.

	CTK Co., Ltd. (Ho-dong) 113, Yejik-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, KOREA, REPUBLIC OF Tel: +82-31-339-9970 Fax: +82-31-624-9501	Report No.: CTK-2020-03117 Page(2) / (22) Pages	
---	---	---	--

Test place

Institution name	CTK Co., Ltd.
Address	142, Dongbu-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, Republic of Korea

 CTK Co., Ltd. The Prime Leader of Global Regulatory Certification	CTK Co., Ltd. (Ho-dong) 113, Yejik-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, KOREA, REPUBLIC OF Tel: +82-31-339-9970 Fax: +82-31-624-9501	Report No.: CTK-2020-03117 Page(3) / (22) Pages	
---	---	--	--

Test item description	NETWORK CAMERA
Trade Mark	
Manufacturer	HANWHA TECHWIN SECURITY VIETNAM CO.,LTD Lot O-2, Que Vo Industrial Zone extended area, Nam Son commune, Bac Ninh city, Bac Ninh province, Vietnam
Model/Type reference	XNF-9010RV
Ratings	Electrical : DC 12 V $\approx$ 1.1 W / PoE(48 $\approx$) 12.95 W DC 12 V $\approx$ 0.92 A / PoE(48 $\approx$) 0.27 A
	Dimension : $\varnothing$ 160 mm by 503 mm, $\varnothing$ 160 mm by 503 mm, $\varnothing$ 98 mm by 308 mm, $\varnothing$ 48 mm by 151 mm,

List of Attachments (including a total number of pages in each attachment):	
Attachment 1: 11-13 pages (Construction Diagram including installation method)	
Attachment 2: 14-19 pages (Parts List)	
Attachment 3: 20-22 pages (photographs)	
Summary of testing:	
Tests performed (name of test and test clause): Clause 5.7(Hose Down Test)	Testing location: CTK Co., Ltd. 142, Dongbu-ro, Cheoin-gu, Yongin-si, Gyeonggi- do, Republic of Korea

Copy of marking plate: The artwork above may be only a draft.	
 기기명칭: NETWORK CAMER 모델명: XNF-9010RV 정격전압: DC 12V $\approx$ 1.1W/ PoE (48 $\approx$) 12.95W M/C: XNF-9010RV/KDO Fac. ID: D DATE S/N: Serial No. MAC ADDRESS: XX-XX-XX-XX-XX-XX 인증번호: R-R-SIW-XNF9010RV 상호: 한화테크윈(주) 제조자/제조국가:한화테크윈(주)/한국	 NETWORK CAMERA MODEL: XNF-9010RV DC 12V $\approx$ 0.92A/ PoE (48 $\approx$) 0.27A M/C: XNF-9010RV/KUS Fac. ID: D DATE S/N: Serial No. MAC ADDRESS: XX-XX-XX-XX-XX-XX CAN ICES-3(A)/NMB-3(A) HANWHA TECHWIN CO.,LTD. MADE IN KOREA

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	
- test object does meet the requirement.....	
	N/A P (Pass)

**CTK Co., Ltd.**

(Ho-dong) 113, Yejik-ro, Cheoin-gu, Yongin-si,
Gyeonggi-do, KOREA, REPUBLIC OF

Tel: +82-31-339-9970

Fax: +82-31-624-9501

Report No.:

CTK-2020-03117

Page(4) / (22) Pages

- 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 TECHWIN SECURITY VIETNAM CO.,LTD

Lot O-2, Que Vo Industrial Zone extended area, Nam Son commune, 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)

General product information:

Applied NEMA Rating : 4X

Model XNF-9010RV is basic model which was tested.

Basic Model	XNF-9010RV
Series model	XNF-9010RVM, ANF-9010RV, ANF-9010RVM, PNF-A9011RV, PNF-A9011RVM, XNF-8011RV, XNF-8011RVM

Model differences:

Series model differences are only for function not related to the quality of enclosure integrity.

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

 CTK Co., Ltd. The Prime Leader of Global Regulatory Certification	CTK Co., Ltd. (Ho-dong) 113, Yejik-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, KOREA, REPUBLIC OF Tel: +82-31-339-9970 Fax: +82-31-624-9501	Report No.: CTK-2018-00456 Page(7) / (22) Pages	
---	---	--	--

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. HB 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		
----------	----------------	--	--

 CTK Co., Ltd. The Prime Leader of Global Regulatory Certification	CTK Co., Ltd. (Ho-dong) 113, Yejik-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, KOREA, REPUBLIC OF Tel: +82-31-339-9970 Fax: +82-31-624-9501	Report No.: CTK-2018-00456 Page(8) / (22) Pages	
---	---	--	--

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	
----------	---------------------	--

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

 CTK Co., Ltd. The Prime Leader of Global Regulatory Certification	CTK Co., Ltd. (Ho-dong) 113, Yejik-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, KOREA, REPUBLIC OF Tel: +82-31-339-9970 Fax: +82-31-624-9501	Report No.: CTK-2018-00456 Page(9) / (22) Pages	
---	--	---	--

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

 CTK Co., Ltd. The Prime Leader of Global Regulatory Certification	CTK Co., Ltd. (Ho-dong) 113, Yejik-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, KOREA, REPUBLIC OF Tel: +82-31-339-9970 Fax: +82-31-624-9501	Report No.: CTK-2018-00456 Page(10) / (22) Pages	
---	---	---	--

Test Information

	Hose Down Test : Clause 5.7	P
--	------------------------------------	----------

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 160 mm by 503 mm, Ø 160 mm by 503 mm, Ø 98 mm by 308 mm,
Ø 48 mm by 151 mm,)

Test Duration = 245 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
XNF-9010RV	240 LPM	No	Pass

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	2019-04-03	2021-04-03
S1-D09	Steel Measuring Tape	5 m	KOMELON/KMC-74N	2019-02-25	2021-02-25
S3-IP20	Water flow meter	250LPM	Nuri tech/Z-4007	2019-07-04	2020-07-04
S1-D03	DIGITAL VERNIER CALIPER	200 mm	MITUTOYO/200 mm	2020-03-26	2021-03-26



CTK Co., Ltd.

(Ho-dong) 113, Yejik-ro, Cheoin-gu, Yongin-si,
Gyeonggi-do, KOREA, REPUBLIC OF

Tel: +82-31-339-9970

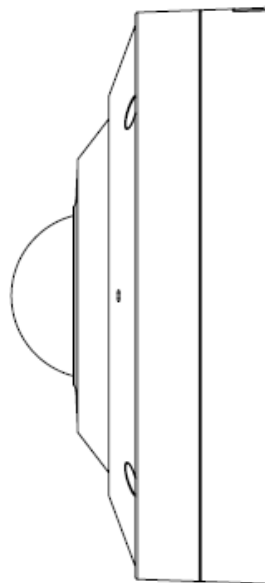
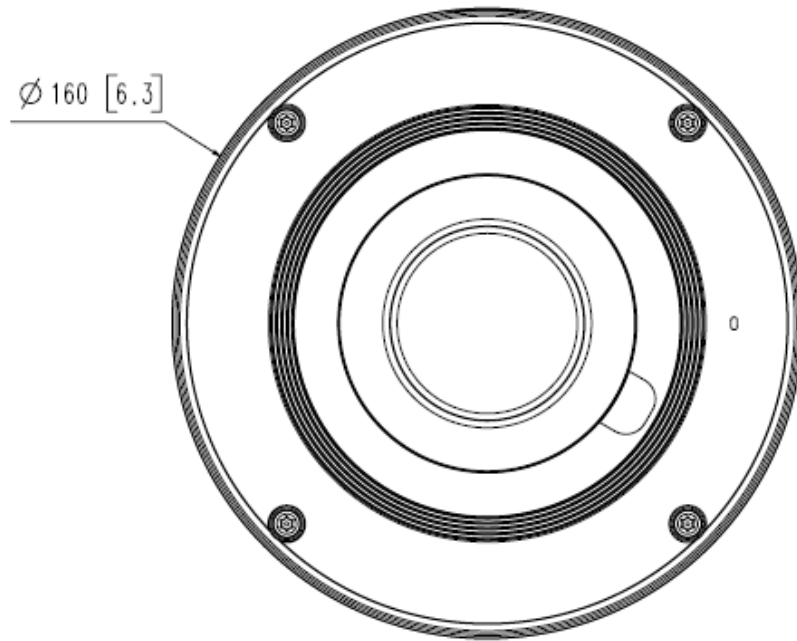
Fax: +82-31-624-9501

Report No.:

CTK-2018-00456

Page(11) / (22) Pages

Attachment 1 – Construction Diagram and installation method





CTK Co., Ltd.

(Ho-dong) 113, Yejik-ro, Cheoin-gu, Yongin-si,
Gyeonggi-do, KOREA, REPUBLIC OF

Tel: +82-31-339-9970

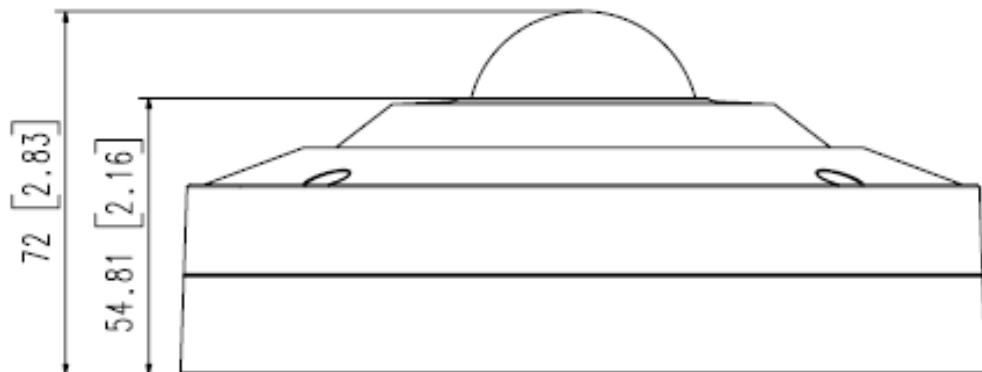
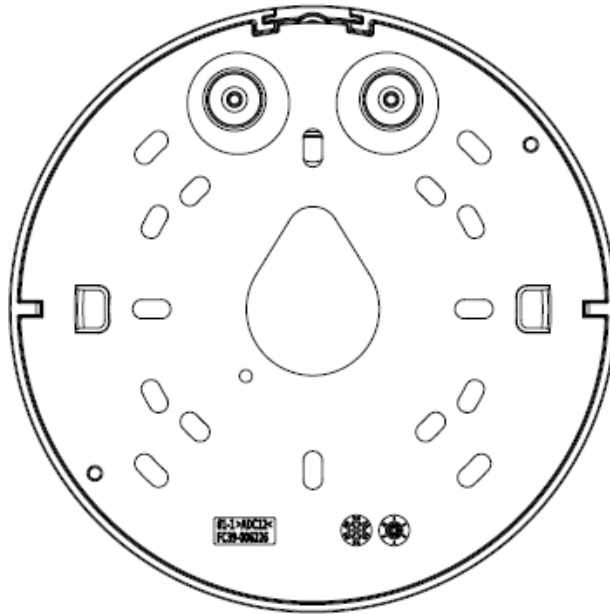
Fax: +82-31-624-9501

Report No.:

CTK-2018-00456

Page(12) / (22) Pages

Attachment 1 – Construction Diagram and installation method





CTK Co., Ltd.

(Ho-dong) 113, Yejik-ro, Cheoin-gu, Yongin-si,
Gyeonggi-do, KOREA, REPUBLIC OF

Tel: +82-31-339-9970

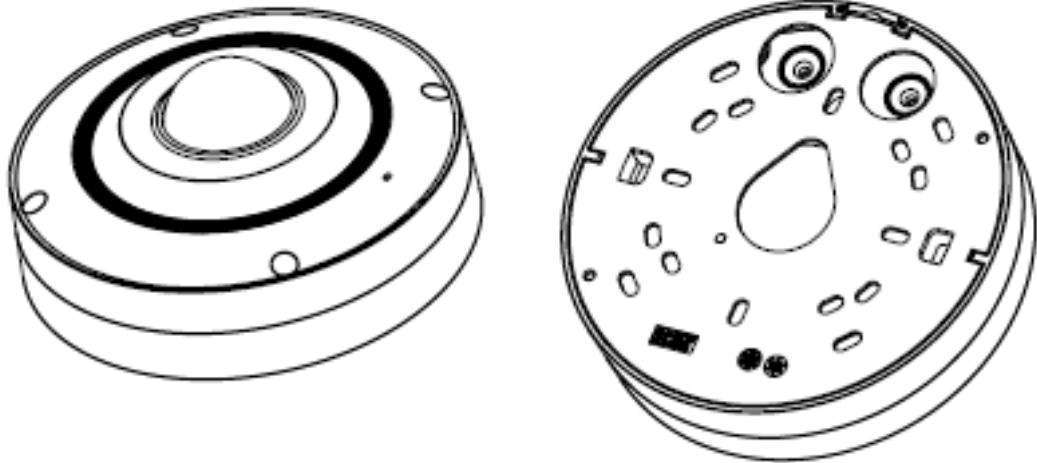
Fax: +82-31-624-9501

Report No.:

CTK-2018-00456

Page(13) / (22) Pages

Attachment 1 – Construction Diagram and installation method





CTK Co., Ltd.
The Prime Leader of Global Regulatory Certification

CTK Co., Ltd.

(Ho-dong) 113, Yejik-ro, Cheoin-gu, Yongin-si,
Gyeonggi-do, KOREA, REPUBLIC OF

Tel: +82-31-339-9970

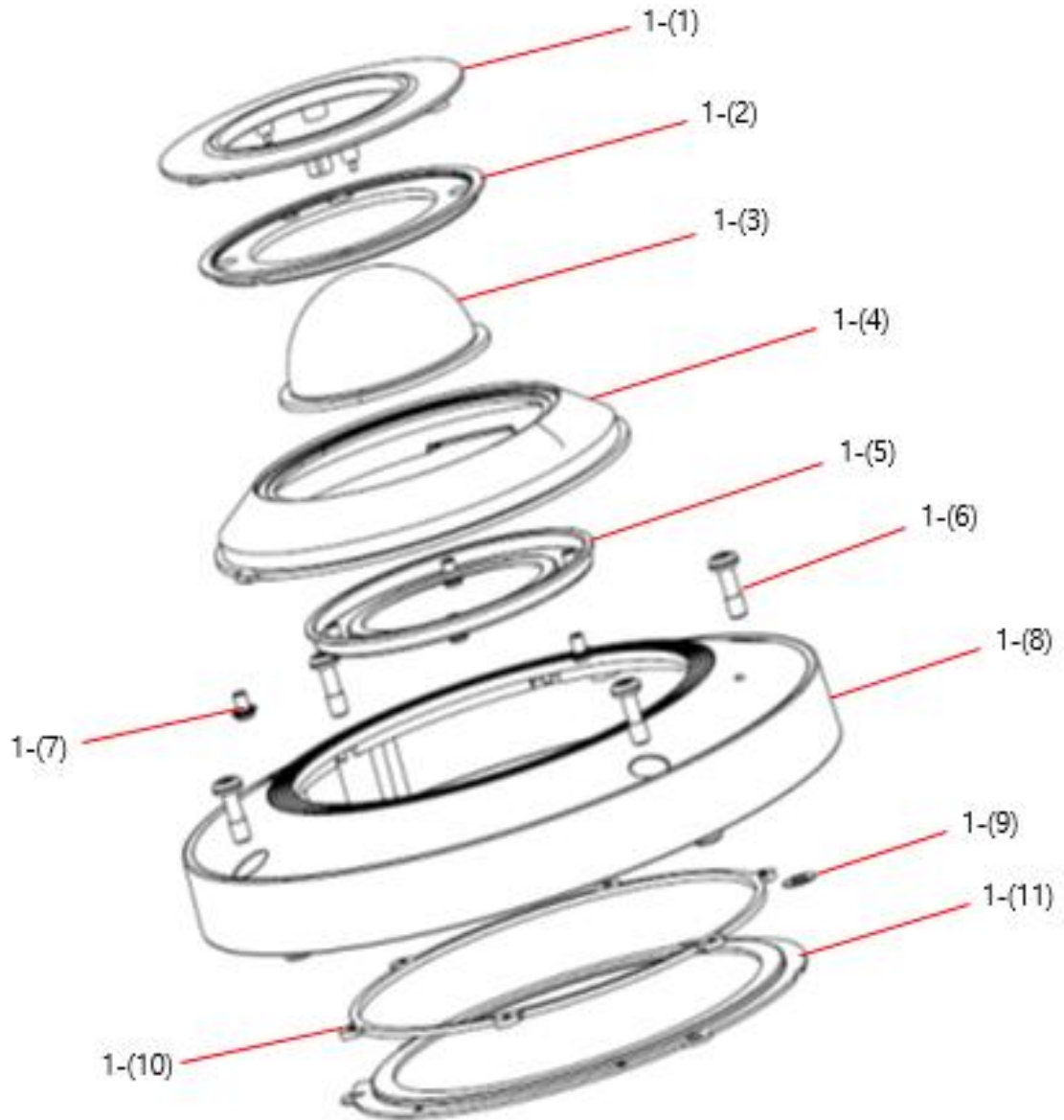
Fax: +82-31-624-9501

Report No.:

CTK-2018-00456

Page(14) / (22) Pages

Attachment 2 – Parts List





CTK Co., Ltd.
The Prime Leader of Global Regulatory Certification

CTK Co., Ltd.

(Ho-dong) 113, Yejik-ro, Cheoin-gu, Yongin-si,
Gyeonggi-do, KOREA, REPUBLIC OF

Tel: +82-31-339-9970

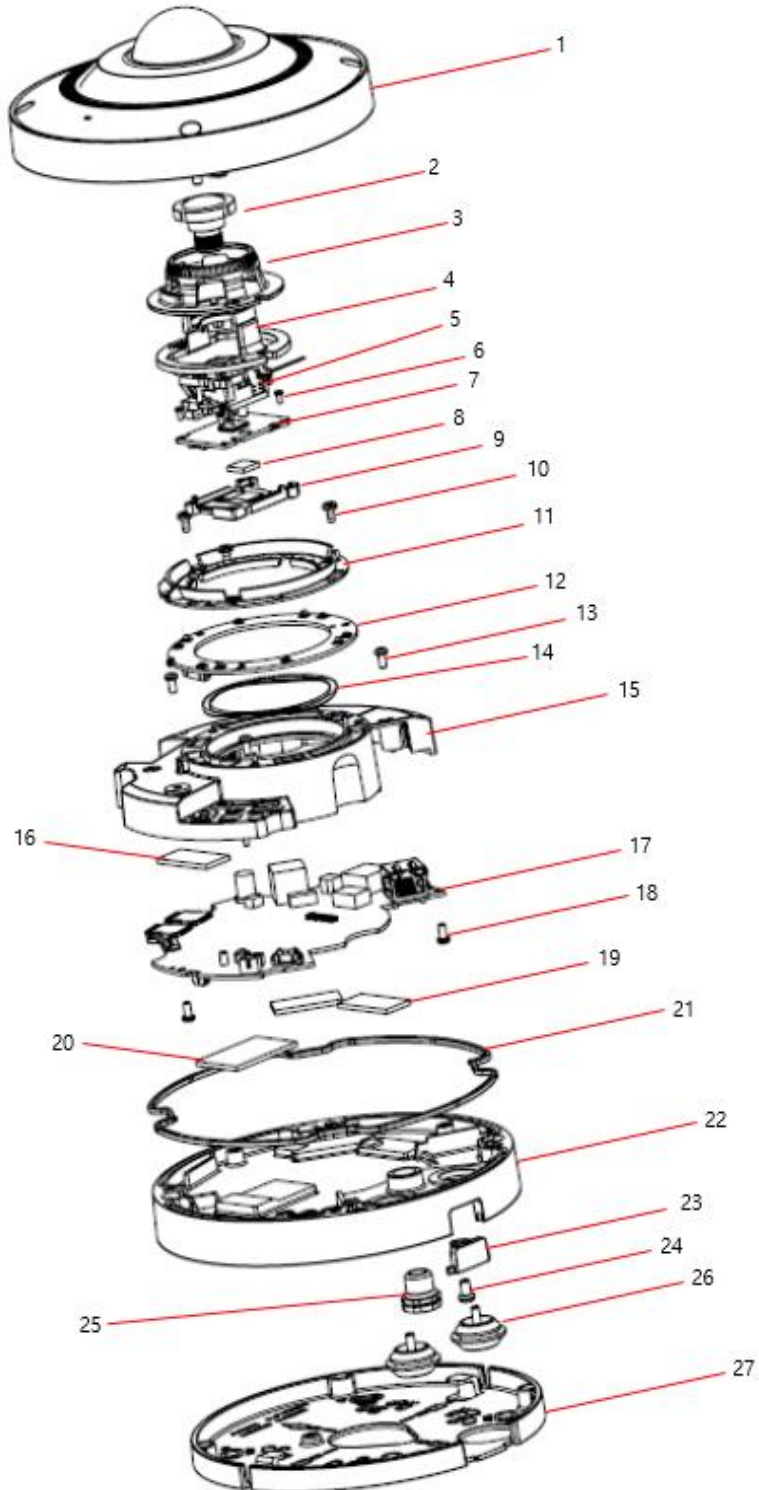
Fax: +82-31-624-9501

Report No.:

CTK-2018-00456

Page(15) / (22) Pages

Attachment 2 – Parts List





CTK Co., Ltd.

(Ho-dong) 113, Yejik-ro, Cheoin-gu, Yongin-si,
Gyeonggi-do, KOREA, REPUBLIC OF

Tel: +82-31-339-9970

Fax: +82-31-624-9501

Report No.:

CTK-2018-00456

Page(16) / (22) Pages

Attachment 2 – Parts List

No	Part Number	Part Name	ea	Material Type
1	AM07-014448A	ASSY,CASE-TOP_XNF-9010RV_WISENET	1	
1-(1)	FC29-013189A	CASE-DOME_XNF-9010RV	1	ALDC
1-(2)	HP07-001566A	GASKET-DOME_XNF-9010RV	1	SILICON RUBBER
1-(3)	FC15-007583B	COVER-DOME_FISHEYE_HC,PC,COATING	1	PC
1-(4)	FC15-005078A	COVER-GLASS_IR_PNF-9010RV;COVER	1	PC
1-(5)	FC09-011730A	BRACKET-DOME_XNF-9010RV	1	SECC
1-(6)	FC18-004000A	SCREW-BUILT-IN_TORX20;0.7,15,N0,4	4	SUS
1-(7)	Z6001055901A	SCREW-MACHINE;6001-001785,PWH,+,M3,L4,Z	7	SWRCH18A
1-(8)	FC29-013164A	CASE-TOP_XNF-9010RV_WISENET	1	ALDC
1-(9)	FC36-001015	SHEET-GORE-ACOUSTIC-GAW3250408P	1	
1-(10)	HP07-001567A	GASKET-CASE_TOP_XNF-9010RV	1	SILICON RUBBER
1-(11)	FC09-011731A	BRACKET-CASE_TOP_XNF-9010RV	1	SECC
2	AM07-013218B	ASSY-LENS-TOTAL_CL1-ABF	1	
3	FC15-007736A	COVER-LENS_XNF-9010RV;-	1	PC
4	FC09-011728A	BRACKET-LENS_XNF-9010RV	1	ALDC
5	AM08-006603A	ASSY-AF_MODULE_XNF-9010RV	1	
6	Z6001055101A	SCREW-MACHINE;6001-001707,BH,+,M2,L4,ZP	6	SWCH18A
7	AM06-009541A	ASSY,PCB-XNF-9010RV,SENSOR	1	
8	FC28-003056A	PAD-THERMAL-10X10XT2,K=7W/M-K	1	SILICONE
9	FC29-013190A	HOLDER-SENSOR_XNF-9010RV	1	ALDC
10	Z6001053501A	SCREW-MACHINE;6001-001476,BH,+,M3,L6,Ni	3	SWCH18A
11	FC28-003187A	REFLECTOR-IR_XNF-9010RV;-	1	PC
12	AM06-009537A	ASSY,PCB-XNF-9010RV,IR	1	
13	Z9642306007	MACHINE SCREW(M3xL6,Zn-B,땀비 머리)	3	SWCH18A
14	FC18-005707A	WASHER,WAVE-XNF-9010RV;- 59	1	SUS
15	FC39-006215A	FRAME-MAIN_XNF-9010RV	1	ALDC
16	FC28-002822A	PAD-THERMAL-30X15XT2,K=7W/M-K	1	SILICONE
17	AM08-009538A	ASSY,PCB-XNF-9010RV,NET WORK	1	
18	Z9642306007	MACHINE SCREW(M3xL6,Zn-B,땀비 머리)	2	SWCH18A
19	FC28-002822A	PAD-THERMAL-30X15XT2,K=7W/M-K	2	SILICONE
20	FC28-002821A	PAD-THERMAL-38X25XT2,K=7W/M-K	1	SILICONE
21	HP07-001568A	GASKET-BOTTOM_XNF-9010RV	1	SILICON RUBBER
22	FC29-013191A	CASE-BOTTOM_XNF-9010RV	1	ALDC
23	FC15-007735A	COVER-CABLE_XNF-9010RV;-	1	ALDC
24	FC18-001118A	SCREW-MACHINE;TORX T20,BH,M4,0.7,L8,SUS	1	SUS
25	HP06-001187	VENT-GORE-PMF100585,MEMBRANE,SCREW IN,PM	1	
26	MC06-001082A	BUSHING-CABLE FLEXIBLE,SILICON,GRAY	2	SILICON RUBBER
27	FC39-006226A	MOUNT-PLATE_XNF-9010RV	1	ALDC

Page(17) / (22) Pages

Attachment 2 – Parts List

Component - Plastics

E41179

MITSUBISHI ENGINEERING-PLASTICS CORP

ENVIRONMENT & QUALITY ASSURANCE DEPT., DIV 1, SHODOME SUMITOMO-BLDG 25TH FL., 1-9-2 HIGASHI-SHINBASHI, MINATO-KU TOKYO 105-0021 J.P.

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 (HVTR): 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 2030, "A" for 1501, 1502, 1511, 1521 & 2502, "N" for NXG5050, NXG5030, NXG5501, & CGF-(v)(u),"S1" for F20-54.

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: 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)	0.38	V-2 (ALL)
			1.5	V-2 (ALL)
			3.0	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 (1.80 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	-	-

Underwriters Laboratories Inc®

Attachment 2 – Parts List



UL 인증 | 롯데첨단소재

INFINO

Grade

SC-1220UR

iq.ul.com

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

E115797

Lotte Advanced Materials Co Ltd

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

SC-122(+)

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

Color	Min Thk (mm)	Flame Class	HWI	HA1	RTI Elec	RTI Imp	RTI Str
ALL	0.75	V-2	-	-	80	80	80
	1.5	V-2	-	-	80	80	80
	2.5	V-2	-	-	80	80	80
	3.0	V-2	-	-	80	80	80
NC	3.2	V-2	-	-	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: 2016-04-16

© 2016 UL LLC



IEC and ISO Test Methods

Test Name	Test Method	Units	Thk (mm)	Value
Flammability	IEC 60695-11-10	Class (color)	0.75	V-2 (ALL)
			1.5	V-2 (ALL)
			2.5	V-2 (ALL)
			3.0	V-2 (ALL)
			3.2	V-2 (NC)
Glow-Wire Flammability (GWFI)	IEC 60695-2-12	C	1.5	900
			2.5	925
			3.2	925
Glow-Wire Ignition (GWIT)	IEC 60695-2-13	C	1.5	800
			2.5	825
			3.2	850
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	-	-



CTK Co., Ltd.

(Ho-dong) 113, Yejik-ro, Cheoin-gu, Yongin-si,
Gyeonggi-do, KOREA, REPUBLIC OF

Tel: +82-31-339-9970

Fax: +82-31-624-9501

Report No.:

CTK-2018-00456

Page(19) / (22) Pages

Attachment 2 – Parts List

143(f1), 143R(f1)

Polycarbonate (PC) "Lexan", furnished as pellets

Color	Min Thk (mm)	Flame Class	HWI	HAI	RTI Elec	RTI Imp	RTI Str
ALL	0.75	HB	-	-	120	120	120
	1.5	HB	4	2	130	125	125
	3.0	HB	4	1	130	130	130

Comparative Tracking Index (CTI): 2

Dielectric Strength (kV/mm): -

High-Voltage Arc Tracking Rate (HVTR): 2

Dimensional Stability (%): 0

Inclined Plane Tracking (IPT): -

Volume Resistivity (10^9 ohm-cm): -

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

(f1) - Suitable for outdoor use with respect to exposure to Ultraviolet Light, Water Exposure and Immersion in accordance with UL 746C.

NOTE - Material designations may be followed by a color nomenclature consisting of either an alpha/numeric or a numeric/alpha combination.

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: 1995-11-06

Last Revised: 2011-02-08

© 2017 UL LLC



IEC and ISO Test Methods

Test Name	Test Method	Units	Thk (mm)	Value
Flammability	IEC 60695-11-10	Class (color)	0.75	HB75 (ALL)
			1.5	HB75 (ALL)
			3.0	HB40 (ALL)
Glow-Wire Flammability (GWI)	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	-	-



CTK Co., Ltd.

(Ho-dong) 113, Yejik-ro, Cheoin-gu, Yongin-si,
Gyeonggi-do, KOREA, REPUBLIC OF

Tel: +82-31-339-9970

Fax: +82-31-624-9501

Report No.:

CTK-2018-00456

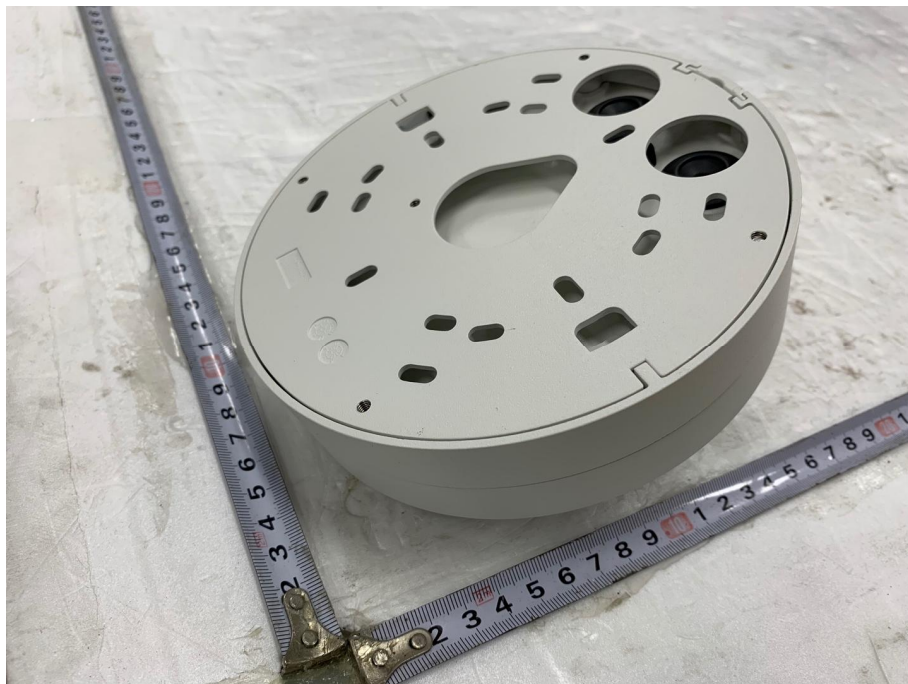
Page(20) / (22) Pages

Attachment 3 – Photographs

<Photo 1 > Test Unit



<Photo 2 > Test Unit





CTK Co., Ltd.

(Ho-dong) 113, Yejik-ro, Cheoin-gu, Yongin-si,
Gyeonggi-do, KOREA, REPUBLIC OF

Tel: +82-31-339-9970

Fax: +82-31-624-9501

Report No.:

CTK-2018-00456

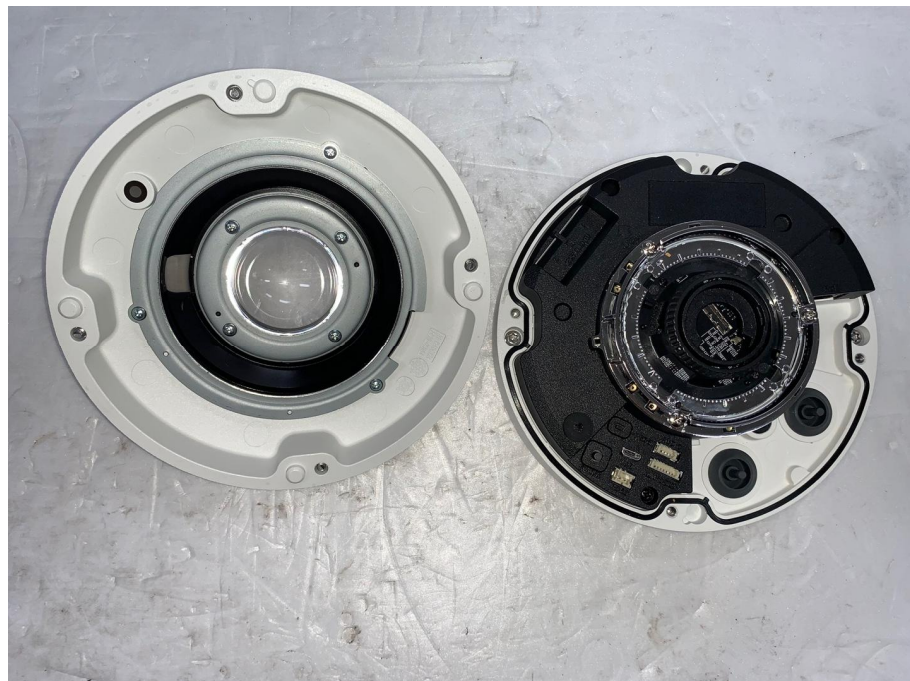
Page(21) / (22) Pages

Attachment 3 – Photographs

<Photo 3 > Hose down test



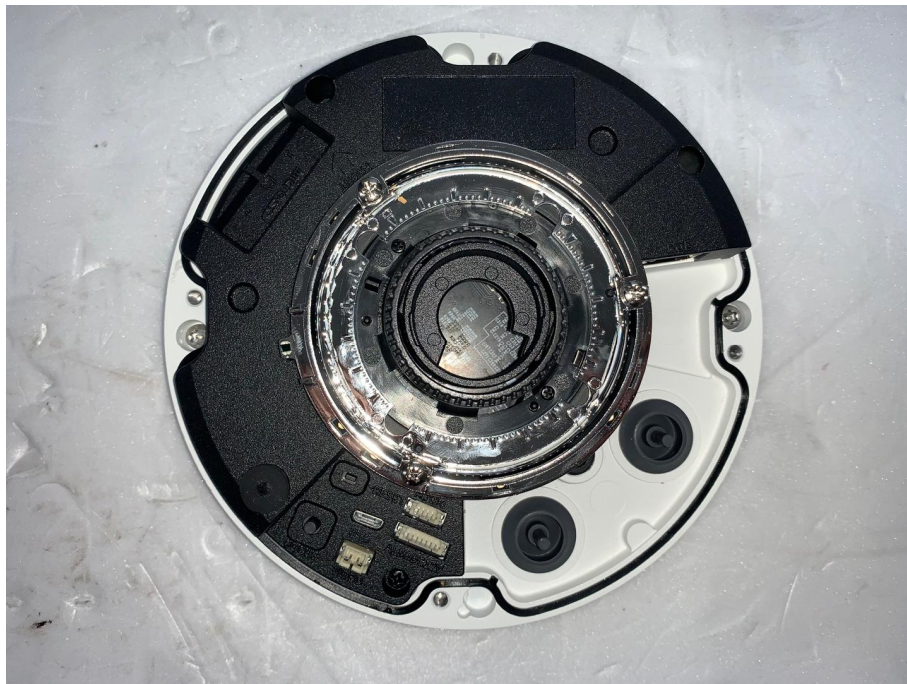
<Photo 4 > Test Result



 CTK Co., Ltd. The Prime Leader of Global Regulatory Certification	CTK Co., Ltd. (Ho-dong) 113, Yejik-ro, Cheoin-gu, Yongin-si, Gyeonggi-do, KOREA, REPUBLIC OF Tel: +82-31-339-9970 Fax: +82-31-624-9501	Report No.: CTK-2018-00456 Page(22) / (22) Pages	
---	--	--	--

Attachment 3 – Photographs

<Photo 5 > Test Result



<Photo 6 >

