

TEST REPORT

**CTK Co., Ltd.**

(Ho-dong) 113, Yejik-ro, Cheoin-gu, Yongin-shi
Gyeonggi-do KOREA, REPUBLIC OF
Tel: +82-31-339-9970
Fax: +82-31-624-9501

REPORT No.:

CTK-2021-02282-1

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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: 2021-05-04

2. Manufacturer

- Name: Hanwha Techwin Co., Ltd
- Address: Lot O-2, Que Vo Industrial Zone extended area, Nam Son
commune, Bac Ninh city, Bac Ninh province, Vietnam



3. Test sample / Model.....: NETWORK CAMERA / TNO-7180R

4. Date(s) of test: 2021-04-24 to 2021-04-30

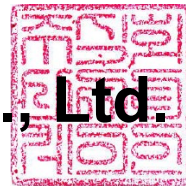
5. Test Standard (Method) used NEMA 250-2014
Enclosures for Electrical Equipment (1000 Volts Maximum)

6. 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:	 (Signature)	Technical Manager:	 (Signature)
	Min-Gi Mun		Sang Wook Woo	

2022-11-07

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Test item description..... : NETWORK CAMERA**Trade Mark**..... : **Wisenet****Manufacturer** : Lot O-2, Que Vo Industrial Zone extended area, Nam Son commune, Bac Ninh city, Bac Ninh province, Vietnam**Model/Type reference** : TNO-71870R**Ratings** : Electrical

PoE(DC 55 V, 50.0 W)

Dimension : 472 mm, 392 mm, Ø 5.8 mm by 18.212 mm,

Ø 6 mm by 18.84 mm * 4, 292 mm,

Ø 12 mm by 37.68 mm * 2, 612 mm,

322 mm, Ø 6 mm by 18.84 * 6, Ø 16 mm by 50.24 mm,

Ø 84 mm by 262.76 mm, Ø 8 mm by 25.12 mm,

Ø 80 mm by 251.2 mm, 568 mm,

Ø 10 mm by 31.4 mm * 4

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

Attachment 1: 11-12 pages (Construction Diagram including installation method)

Attachment 2: 13-15 pages (Parts List)

Attachment 3: 16-21 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 CAMERA

모델명: TNO-7180R

정격전압: DC 12V ~ 47.5W /
PoE(55V ~) 50.0W

M/C: TNO-7180R/KDO



2021.05 S/N:Serial No.

MAC ADDRESS: XX-XX-XX-XX-XX-XX

인증번호: R-R-SIW-TNO7180R

상호: 한화테크윈(주)

제조자/제조국가:한화테크윈(주)/한국



NETWORK CAMERA

MODEL: TNO-7180R

DC 12V ~ 4.0A /

PoE(55V ~) 0.92A

M/C: TNO-7180R/KUS Fac. ID: D



2021.05 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



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NETWORK CAMERA, TNO-7180RLP

DC 12V $\overline{\sim}$ 4.0A / PoE(55V $\overline{\sim}$ 0.92A)

M/C: TNO-7180RLP/KEU Fac.ID:D



2022.11 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

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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 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 TNO-71870R is basic model which was tested.

Type 4X

Enclosures constructed for either indoor or outdoor use to provide a degree of protection for personnel against access to hazardous parts; to provide a degree of protection for equipment inside the enclosure against ingress of solid foreign objects (e.g., windblown dust); to provide a degree of protection with respect to hazardous equipment due to the ingress of water (rain, sleet, snow, splashing water); that provides an increased level of protection against corrosive



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

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

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

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

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

Enclosure Type	Test Conditions	Degree of Protection	
		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

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

Enclosure Type	Test Conditions	Degree of Protection	
		Brief Description	Definition
4X	<u>Non-vented</u> 5.7	Windblown dust protected	No ingress of dust
	<u>Vented</u> 5.5.1 Dust		

Table 5-1C
Degrees of Protection against Water

Enclosure Type	Test Conditions	Degree of Protection	
		Brief Description	Definition
4X	5.7	Protected against hose directed water	Water projected against the enclosure in any direction shall not enter

Table 5-1D
Additional Protection

Enclosure Type	Test Conditions	Additional Protection	
		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 th

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Clause	Requirement + Test	Result - Remark	Verdict
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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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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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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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Clause	Requirement + Test	Result - Remark	Verdict
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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(472 mm, 392 mm, Ø 5.8 mm by 18.212 mm, Ø 6 mm by 18.84 mm *4, 292 mm,
Ø 12 mm by 37.68 mm * 2, 612 mm, 322 mm, Ø 6 mm by 18.84 * 6,
Ø 16 mm by 50.24 mm, Ø 84 mm by 262.76 mm, Ø 8 mm by 25.12 mm,
Ø 80 mm by 251.2 mm, 568 mm, Ø 10 mm by 31.4 mm * 4)


Test Duration = 610 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
TNO-71870R	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	2021-03-19	2023-03-03
C-S1-D09	Steel Measuring Tape	5 m	KOMELON/KMC-74N	2019-07-22	2021-07-02
S3-IP23	Water flow meter	250LPM	Nuri tech/ Z-6504	2020-07-22	2021-07-01
C-S1-D02	DIGITAL VERNIER CALIPER	150 mm	MITUTOYO/150 mm	2020-09-19	2021-08-24

Model description

Basic Model	TNO-7180R
Series model	TNO-7180RLP
Model differences	The model TNO-7180RLP is identical to TNO-7180R except model designation.

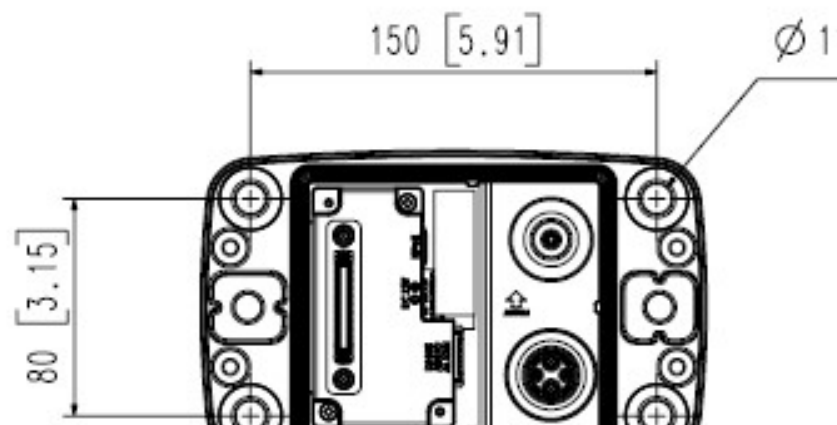
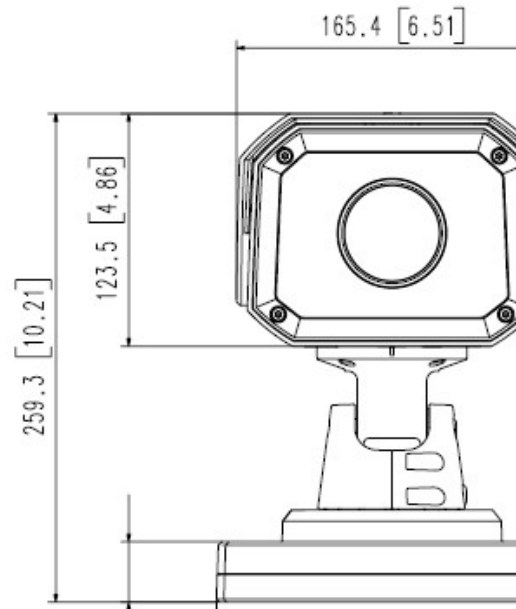
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Attachment 1 – Construction Diagram and installation method



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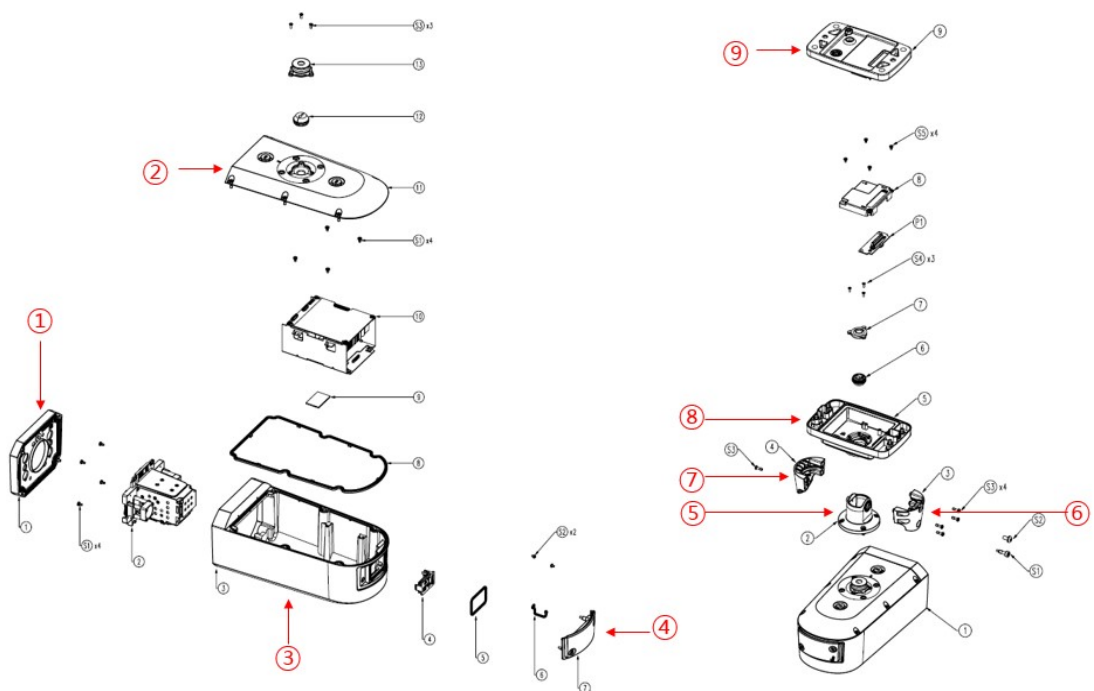
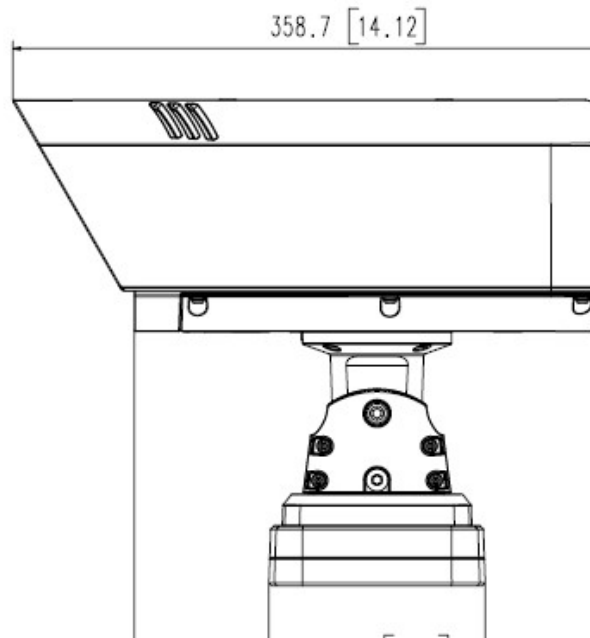
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Attachment 1 – Construction Diagram and installation method



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Attachment 2 – Parts List

구분	재질	품명	재질
1	알루미늄	COVER-FRONT	AL
2	알루미늄	COVER-BOTTOM	AL
3	알루미늄	COVER-TOP	AL
4	알루미늄	COVER-INTERFACE	AL
5	알루미늄	BRACKET-PAN	AL
6	알루미늄	BRACKET-TILT-R	AL
7	알루미늄	BRACKET-TILT-L	AL
8	알루미늄	COVER-TOP-BACKBOX	AL
9	알루미늄	COVER-BOTTOM-BACKBOX	AL

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Attachment 2 – Parts List**Component - Plastics**

File Number: E67171

LG CHEM LTD
20 YOIDO-DONG
YONGDUNGPO-GU
SEOUL, 150-721 Republic of Korea

LI996(&)

Acrylonitrile Styrene Acrylate (ASA), pellets

(&) - May be replaced by one, two, or three numbers and/or letter, except Grade AF367SH, XR401B, AF366F

Flammability	Value	
Flame Rating		U
2.0 mm, ALL	V-0	IE
3.0 mm, ALL	V-0	
Electrical	Value	
Hot-wire Ignition (HWI)		U
2.0 mm	PLC 4	
3.0 mm	PLC 4	
High Amp Arc Ignition (HAI)		U
2.0 mm	PLC 0	
3.0 mm	PLC 0	
Comparative Tracking Index (CTI)	PLC 2	U
High Voltage Arc Tracking Rate (HVTR)	PLC 2	U
Arc Resistance	PLC 5	A
Thermal	Value	
RTI Elec		U
2.0 mm	50.0 °C	
3.0 mm	50.0 °C	
RTI Imp		U
2.0 mm	50.0 °C	
3.0 mm	50.0 °C	
RTI Str		U
2.0 mm	50.0 °C	
3.0 mm	50.0 °C	

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Attachment 2 – Parts List**Component - Plastics**

File Number: E56070

CHI MEI CORPORATION

59-1 SAN CHIA

JEN TE

TAINAN, 717 Taiwan

WONDERLITE: PC-6715VT(f1)(a)

Polycarbonate (PC), pellets

(a) - Ball pressure temperature is in accordance with IEC 60695-10-2 Method B.

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

Flammability	Value
Flame Rating	
1.5 mm, ALL	V-0
3.0 mm, ALL	V-0, 5VA
Glow Wire Flammability Index	
1.5 mm	960 °C
3.0 mm	960 °C
Glow Wire Ignition Temperature	
1.5 mm	825 °C
3.0 mm	850 °C
Electrical	Value
Hot-wire Ignition (HWI)	
1.5 mm	PLC 3
3.0 mm	PLC 3
High Amp Arc Ignition (HAI)	
1.5 mm	PLC 1
3.0 mm	PLC 1
Comparative Tracking Index (CTI)	PLC 2
Dielectric Strength	30 kV/mm
High Voltage Arc Tracking Rate (HVTR)	PLC 2
Volume Resistivity	1.0E+14 ohms-cm
Arc Resistance	PLC 6
Thermal	Value
RTI Elec	
1.5 mm	130 °C
3.0 mm	130 °C
RTI Imp	
1.5 mm	115 °C
3.0 mm	120 °C
RTI Str	
1.5 mm	125 °C
3.0 mm	130 °C



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Attachment 3 – Photographs

<Photo 1 > Test Unit



<Photo 2 >





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Attachment 3 – Photographs

<Photo 3> Hose down test





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Attachment 3 – Photographs

<Photo 4 > Test Result



<Photo 5 >





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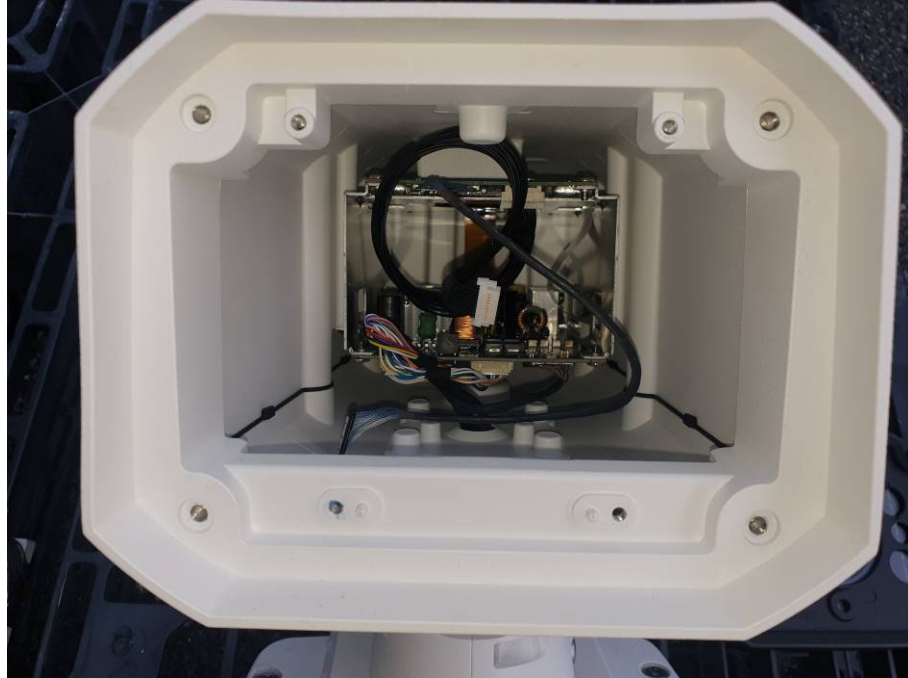
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Attachment 3 – Photographs

<Photo 6 > Test Result



<Photo 7 >





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Attachment 3 – Photographs

<Photo 8 > Test Result



<Photo 9 >





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