

# TEST REPORT

|                                                                                   |                                                                                                                                                           |                                                       |  |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|--|
|  | <b>CTK Co., Ltd.</b><br>(Ho-dong) 113, Yejik-ro, Cheoin-gu, Yongin-si,<br>Gyeonggi-do, KOREA, REPUBLIC OF<br>Tel: +82-31-339-9970<br>Fax: +82-31-624-9501 | Report No.:<br>CTK-2022-01853<br>Page(1) / (25) 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 .....: 2017-10-26

## 2. Manufacturer

- Name .....: Hanwha Techwin Co., Ltd.

3. Test sample / Model .....: THERMAL CAMERA / TNO-4040T\* (\*N:NT/P:PAL)

4. Date(s) of test .....: 2017-11-01

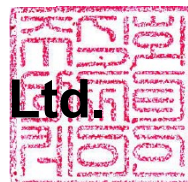
5. Test Standard (Method) used .....: NEMA 250-2014  
Enclosures for Electrical Equipment (1000 Volts Maximum)

6. Results .....: Pass

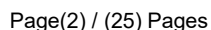
The results shown in this test report refer only to the sample(s) tested unless otherwise stated.  
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|          |                                                                                                                                |                                                                                                                                             |
|----------|--------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
| Approval | Tested by:<br>MinGi Moon<br><br>(Signature) | Technical Manager:<br>WonHyeon Choi<br><br>(Signature) |
|----------|--------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------|

**CTK Co., Ltd.**



2022-07-20



**CTK Co., Ltd.**(Ho-dong) 113, Yejik-ro, Cheoin-gu, Yongin-si,  
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**NETWORK THERMAL CAMERA**  
**MODEL : TNO-4030TP**  
 AC24V~50Hz 0.91A / DC12V ≡ 0.83A  
 PoE(37-57V≡) 0.27A  
 M/C : VCVF002PEU Fac. ID : S  
  
 Jan 2010 S/N:XXXX XXXXXXXXXXXXX  
 MAC ADDRESS : XX-XX-XX-XX-XX-XX  
 CAN ICES-3(A)/NMB-3(A)  
 HANWHA TECHWIN CO.,LTD.  
 MADE IN KOREA

PT03-002454B



**제품명칭 : NETWORK THERMAL CAMERA**  
**모 델 명 : TNO-4040TN**  
 정격전압 : AC24V~60Hz 10.5W / DC12V≡ 9W  
 PoE(37-57V≡) 10W  
 M/C : VCVK018NDO  
  
 제조년월 : 2010.01 S/N:XXXX XXXXXXXXXXXXX  
 MAC ADDRESS : XX-XX-XX-XX-XX-XX  
 인증번호 : MSIP-REM-STW-TNO4050T  
**제조사/제조국가: 한화테크윈(주) / 한국**

PT03-002454A








**NETWORK THERMAL CAMERA**  
**MODEL : TNO-4040TN**  
 AC24V~60Hz 0.91A / DC12V ≡ 0.83A  
 PoE(37-57V≡) 0.27A  
 M/C : VCVF002PEU Fac. ID : D  
  
 Jan 2010 S/N:XXXX XXXXXXXXXXXXX  
 MAC ADDRESS : XX-XX-XX-XX-XX-XX  
 CAN ICES-3(A)/NMB-3(A)  
 HANWHA TECHWIN CO.,LTD.  
 MADE IN KOREA

PT03-002454B








**NETWORK THERMAL CAMERA**  
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 PoE(37-57V≡) 0.27A  
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 Jan 2010 S/N:XXXX XXXXXXXXXXXXX  
 MAC ADDRESS : XX-XX-XX-XX-XX-XX  
 CAN ICES-3(A)/NMB-3(A)  
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**제품명칭 : NETWORK THERMAL CAMERA**  
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 제조년월 : 2010.01 S/N:XXXX XXXXXXXXXXXXX  
 MAC ADDRESS : XX-XX-XX-XX-XX-XX  
 인증번호 : MSIP-REM-STW-TNO4050T  
**제조사/제조국가: 한화테크윈(주) / 한국**

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AC24V~50Hz 0.91A / DC12V ≡ 0.83A  
PoE(37-57V ≡) 0.27A  
M/C : VCVF002PEU Fac. ID : S  
  
Jan 2010 S/N:XXXX XXXXXXXXXXXXX  
MAC ADDRESS : XX-XX-XX-XX-XX-XX  
CAN ICES-3(A)/NMB-3(A)  
HANWHA TECHWIN CO.,LTD.  
MADE IN KOREA

PT03-002454B

  
NETWORK THERMAL CAMERA  
MODEL : TNO-4040TR  
AC24V~60Hz 0.91A / DC12V ≡ 0.83A  
PoE(37-57V ≡) 0.27A  
M/C : VCVF002PEU Fac. ID : D  
  
Jan 2010 S/N:XXXX XXXXXXXXXXXXX  
MAC ADDRESS : XX-XX-XX-XX-XX-XX  
CAN ICES-3(A)/NMB-3(A)  
HANWHA TECHWIN CO.,LTD.  
MADE IN KOREA

PT03-002454B

  
제품명칭 : NETWORK THERMAL CAMERA  
모 델 명 : TNO-4040TR  
정격전압 : AC24V~60Hz 10.5W / DC12V ≡ 9W  
PoE(37-57V ≡) 10W  
M/C : VCVK018NDO  
  
제조년월 : 2010.01 S/N:XXXX XXXXXXXXXXXXX  
MAC ADDRESS : XX-XX-XX-XX-XX-XX  
인증번호 : R-R-StW-TNO4040TR  
제조사/제조국가: 한화테크윈(주) / 한국

PT03-002454A

  
제품명칭 : NETWORK THERMAL CAMERA  
모 델 명 : TNO-4030TR  
정격전압 : AC24V~60Hz 10.5W / DC12V ≡ 9W  
PoE(37-57V ≡) 10W  
M/C : VCVK018NDO  
  
제조년월 : 2010.01 S/N:XXXX XXXXXXXXXXXXX  
MAC ADDRESS : XX-XX-XX-XX-XX-XX  
인증번호 : R-R-StW-TNO4040TR  
제조사/제조국가: 한화테크윈(주) / 한국

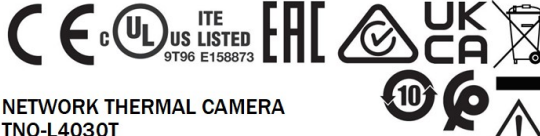
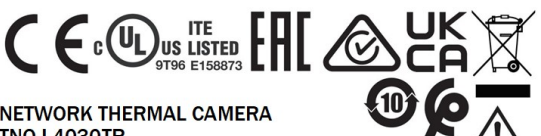
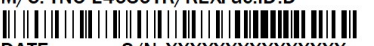
PT03-002454A

  
NETWORK THERMAL CAMERA  
MODEL : TNO-4030TR  
AC24V~60Hz 0.91A / DC12V ≡ 0.83A  
PoE(37-57V ≡) 0.27A  
M/C : VCVF002PEU Fac. ID : D  
  
Jan 2010 S/N:XXXX XXXXXXXXXXXXX  
MAC ADDRESS : XX-XX-XX-XX-XX-XX  
CAN ICES-3(A)/NMB-3(A)  
HANWHA TECHWIN CO.,LTD.  
MADE IN KOREA

PT03-002454B

  
NETWORK THERMAL CAMERA  
MODEL: TNO-3050T  
AC 24V ~ 50/60Hz 0.7A/DC 12V ≡ 0.65A  
/PoE(48V ≡) 0.18A  
M/C: TNO-3050T/KUS Fac. ID: D  
  
2021.03 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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|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|--|

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <br><b>NETWORK THERMAL CAMERA</b><br><b>TNO-L4030T</b><br>AC 24V~50/60Hz 0.91A/DC 12V --- 0.83A/<br>PoE(37-57V --- ) 0.27A<br>M/C: TNO-L4030T/KEX Fac.ID:D<br><br>DATE S/N: XXXXXXXXXXXXXXXX<br>MAC ADDRESS: XX-XX-XX-XX-XX-XX<br>CAN ICES-3(A)/NMB-3(A)<br>HANWHA TECHWIN CO.,LTD.<br>MADE IN KOREA | <br><b>NETWORK THERMAL CAMERA</b><br><b>TNO-L4030TR</b><br>AC 24V~50/60Hz 0.91A/DC 12V --- 0.83A/<br>PoE(37-57V --- ) 0.27A<br>M/C: TNO-L4030TR/KEX Fac.ID:D<br><br>DATE S/N: XXXXXXXXXXXXXXXX<br>MAC ADDRESS: XX-XX-XX-XX-XX-XX<br>CAN ICES-3(A)/NMB-3(A)<br>HANWHA TECHWIN CO.,LTD.<br>MADE IN KOREA |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                                                                                                                                                                                                                                       |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Test item particulars</b> ..... : Network Camera                                                                                                                                                                                                                                   |
| <b>Classification of installation and use</b> ..... : Outdoor(Watertight/Corrosion Resistant)                                                                                                                                                                                         |
| <b>Possible test case verdicts:</b><br>- test case does not apply to the test object..... : N/A<br>- test object does meet the requirement ..... : P (Pass)<br>- test object does not meet the requirement..... : F (Fail)<br>- test case does not evaluated to the test object : N/E |

|                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>General remarks:</b><br>"(See Enclosure #)" refers to additional information appended to the report.<br>"(See appended table)" refers to a table appended to the report.<br>Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.<br>Clause numbers between brackets refer to clauses in NEMA 250-2014 |
| <b>Name and address of factory (ies):</b><br>1)HANWHA TECHWIN SECURITY VIETNAM CO.,LTD<br>Lot O-2, Que Vo Industrial Zone extended area, Nam Son commune, Bac Ninh city, Bac Ninh province,<br>Vietnam<br>2)D-TECH CO.,LTD.<br>173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi-do, Korea(Suwon Industrial Complex)                                                                     |

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**General product information:**

Applied NEMA Rating : 4X

Model TNO-4040T\* (\*N:NT/P:PAL) is basic model which was tested.

|                    |                                                                                     |
|--------------------|-------------------------------------------------------------------------------------|
| Basic Model .....  | TNO-4040T* (*N:NT/P:PAL)                                                            |
| Series model ..... | TNO-4030T, TNO-4050T, TNO-4030TR, TNO-4040TR,<br>TNO-3050T, TNO-L4030T, TNO-L4030TR |

**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 against access to hazardous parts; to provide a degree of protection for equipment inside the enclosure against ingress of solid foreign objects (falling dirt, windblown dust); to provide a degree of protection with respect to hazardous liquids (water) due to the ingress of water (rain, sleet, snow, splashing water); that provides an increased level of protection against corrosion.

**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  |
| 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   |



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**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   |   |
| 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   | X   |   |
| Ingress of water (rain, snow, and sleet **)                                      | 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   |   |
| Ingress of water (hosedown and splashing water)                                  | ...               | ... | ... | ... | ... | ... | X   |   |
| Corrosive agents                                                                 | ...               | X   | ... | X   | ... | X   | ... |   |
| Ingress of water (occasional temporary submersion)                               | ...               | ... | ... | ... | ... | ... | ... |   |
| Ingress of water (occasional prolonged submersion)                               | ...               | ... | ... | ... | ... | ... | ... |   |

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

| Enclosure Type | Test Conditions | Degree of Protection                                    |                                               | Reference |
|----------------|-----------------|---------------------------------------------------------|-----------------------------------------------|-----------|
|                |                 | 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><br>5.7    | Windblown dust protected | No ingress of dust |
|                | <u>Vented</u><br>5.5.1 Dust |                          |                    |

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**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<br>5.9<br>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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**NEMA 250-2014**

| Clause | Requirement + Test | Result - Remark | Verdict |
|--------|--------------------|-----------------|---------|
|--------|--------------------|-----------------|---------|

|          |                     |  |  |
|----------|---------------------|--|--|
| <b>3</b> | <b>CONSTRUCTION</b> |  |  |
|----------|---------------------|--|--|

|      |                               |                                                                                                                                                                            |     |
|------|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| 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 <sup>2</sup> (1 in <sup>2</sup> ) in area<br>Polymeric Materials used is declared as Min. V-0<br>Used to UL certified material.<br>(See the attachment 2) | N/E |
| 3.5  | Corrosion Protection          | Stainless steel and/or aluminium are declared as the materials used<br>(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<br>(See the attachment 1)                                                                                              | P   |
| 3.8  | Conduit Connection            | No conduit connection<br>(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)<br>(See clause 5.14 and the attachment 2)                                                  | P   |
| 3.15 | Observation Windows           | No Observation Window                                                                                                                                                      | N/A |

|          |                |  |  |
|----------|----------------|--|--|
| <b>4</b> | <b>MARKING</b> |  |  |
|----------|----------------|--|--|

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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     |

|          |                     |  |
|----------|---------------------|--|
| <b>5</b> | <b>DESIGN TESTS</b> |  |
|----------|---------------------|--|

|      |                                                                                                                 |                                                                         |     |
|------|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-----|
| 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<br>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 |
|--|-----------------------------|---|

### 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 147.51 mm by 401.8 mm)

Test Duration = 130.6 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-4040TN        | 240 LPM    | No                       | Pass   |

|                                                                                   |                                                                                                                                                           |                                                               |  |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|--|
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|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|--|

**List of test equipment used:**

| Instr.<br>Code | Instrument Type            | Range Used | Mfr./Model       | Calibration Date |                                                    |
|----------------|----------------------------|------------|------------------|------------------|----------------------------------------------------|
|                |                            |            |                  | Last             | Due                                                |
| S3-IP18        | 25.4mm Nozzle              | 25.4 mm    | CTK/S3-IP18      | -                | Checked<br>by calliper<br>below<br>before<br>using |
| S1-SW2         | Stop Watch                 | 0.01 s     | CASIO/ NONE      | 2016-03-16       | 2018-03-16                                         |
| S1-D09         | Steel Measuring Tape       | 5 m        | KOMELON/KMC-74N  | 2013-06-11       | 2018-06-11                                         |
| S3-IP20        | Water flow meter           | 250LPM     | Nuri tech/Z-4007 | 2017-04-14       | 2018-04-14                                         |
| S1-D03         | DIGITAL VERNIER<br>CALIPER | 200 mm     | MITUTOYO/200 mm  | 2017-03-21       | 2018-03-21                                         |



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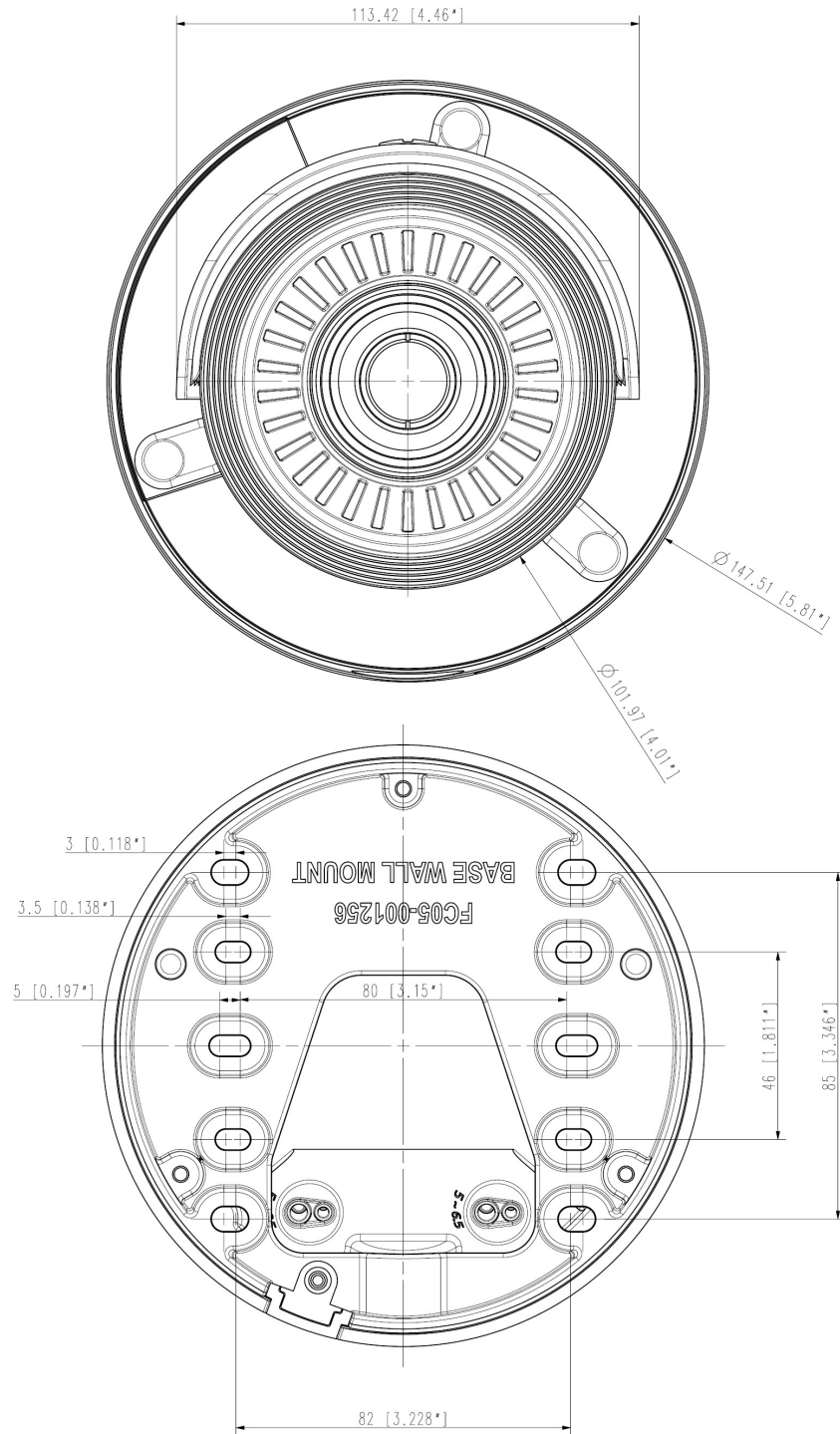
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### Attachment 1 – Construction Diagram and installation method





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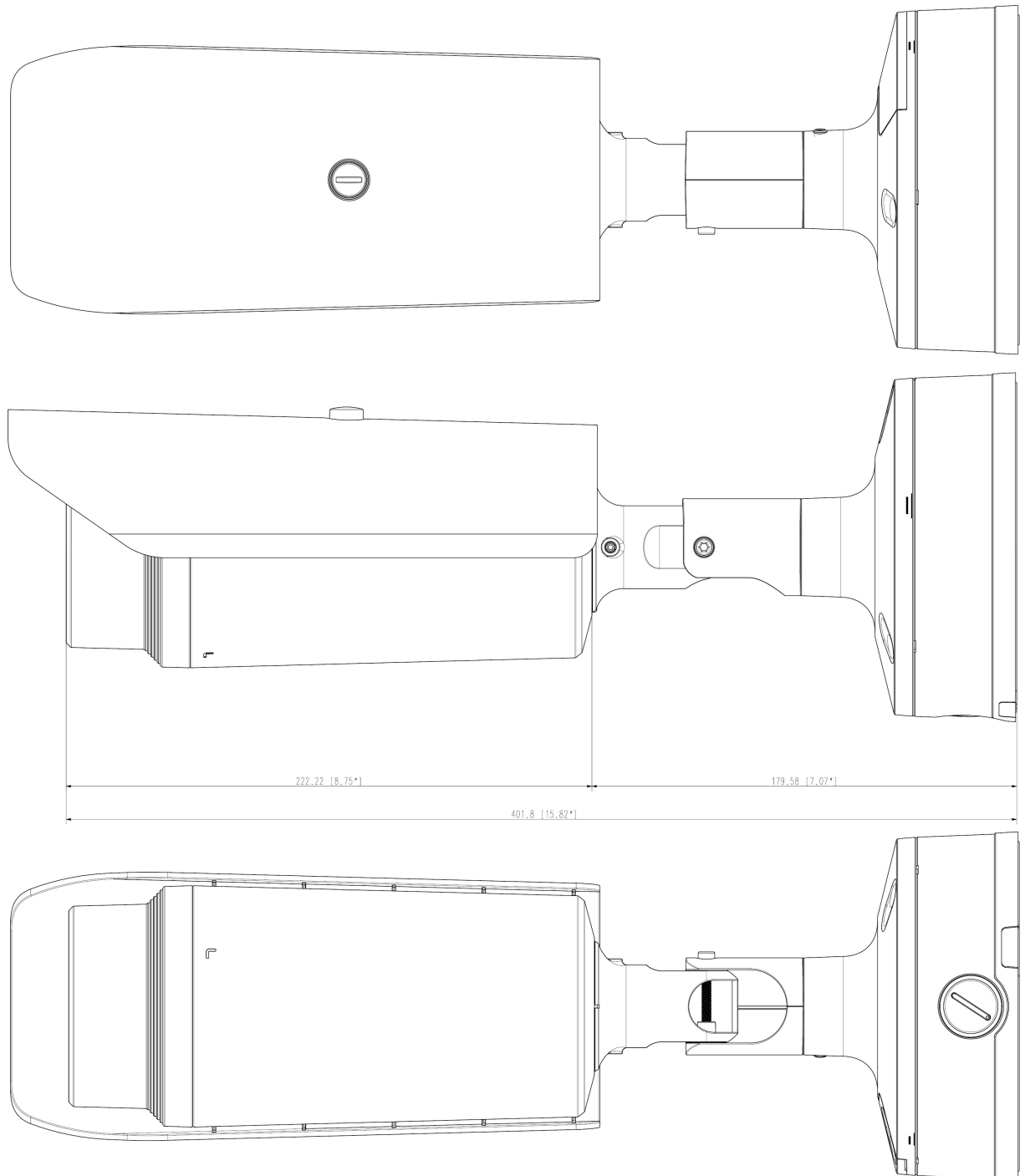
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### Attachment 1 – Construction Diagram and installation method





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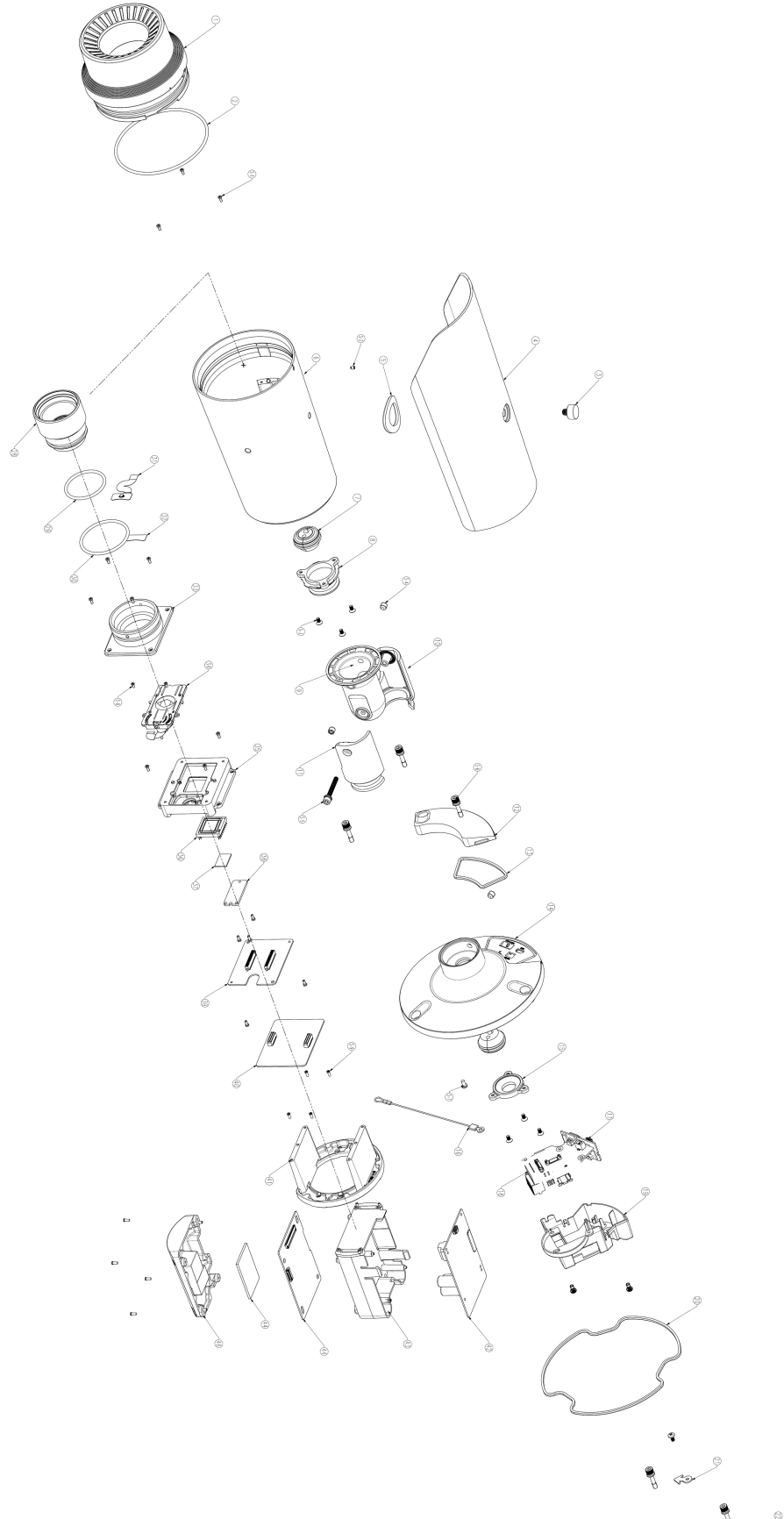
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### Attachment 1 – Construction Diagram and installation method



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**Attachment 2 – Parts List**

| No | Code No.     | Parts name                | Material                            | Part type |
|----|--------------|---------------------------|-------------------------------------|-----------|
| 1  | FC15-005952A | Cover front for 19&35     | ADC12 + Spray                       | DC        |
| 2  | FC18-004516A | O-ring_D1 88.57 / D2 2.62 | Silicone rubber                     | RB        |
| 3  | FC28-002617A | Knob shield sun           | ADC12 + Spray                       | DC        |
| 4  | FC28-002613A | Shield sun                | LG chem. ASA LI936 - V0             | MD        |
| 5  | FC28-002616A | Foot shield sun           | Silicone rubber + Double sided tape | RB        |
| 6  | FC15-005953A | Cover rear                | ADC12 + Spray                       | DC        |
| 7  | HP07-001180A | Gasket cable              | Silicone rubber                     | RB        |
| 8  | FC29-002456B | Guide panning             | ADC12                               | DC        |
| 9  | FC39-001271D | Body panning              | ADC12 + Spray                       | DC        |
| 10 | FC39-001270C | Body tilt left            | ADC12 + Spray                       | DC        |
| 11 | FC39-001269C | Body tilt right           | ADC12 + Spray                       | DC        |
| 12 | FC28-002443B | Door back box button      | ADC12 + Spray                       | DC        |
| 13 | HP07-001179A | Gasket button             | Silicone rubber                     | RB        |
| 14 | FC15-005958A | Cover top back box        | ADC12 + Spray                       | DC        |
| 15 | FC15-005367A | Cover cable gasket        | ADC12                               | DC        |
| 16 | RM01-003400A | Wire safety               | STS304                              | ETC       |
| 17 | XXxx-xxxxxxA | PBA micro SD              | Complex (Electric parts)            | A         |
| 18 | XXxx-xxxxxxA | PBA Interface             | Complex (Electric parts)            | A         |
| 19 | FC15-005954A | Cover interface           | Lotte chem. PC NH1035 K2261 - V0    | MD        |
| 20 | HP07-001178A | Gasket back box           | Silicone rubber                     | RB        |
| 21 | FC09-006670A | Bracket wire              | SUS304                              | PD        |
| 22 | FC29-008671B | Case bottom BB            | ADC12 + Spray                       | DC        |
| 23 | MC06-001042A | Bushing cable set         | Silicone rubber                     | RB        |
| 24 | FC05-001256B | Base wall mount           | ADC12 + Spray                       | DC        |
| 25 | FC29-008748B | Cap cable hole            | Lotte chem. PC NH1035 W92814 - V0   | MD        |
| 26 | FC18-001028A | O-ring_D1 27.5 / D2 2.8   | Silicone rubber                     | RB        |
| 27 | FC29-003420C | 3120V Cap bolt            | ADC12 + Spray                       | DC        |
| 28 | XXxx-xxxxxxA | Athermalized Lens - 19mm  | Ass'y lens                          | A         |
| 29 | FC18-004517A | O-ring_D1 36.17 / D2 2.62 | Silicone rubber                     | RB        |
| 30 | FC18-004518A | O-ring_D1 44.12 / D2 2.62 | Silicone rubber                     | RB        |
| 31 | XXxx-xxxxxxA | FBPA temp. sensor         | Complex (Electric parts)            | A         |
| 32 | RM04-001069A | Tape temp. for holder     | 3M 9473                             | TP        |
| 33 | FC29-009745A | Holder lens               | Aluminum 6063 + Anodizing           | ETC       |
| 34 | XXxx-xxxxxxA | Ass'y Shutter             | Complex (Electric parts)            | A         |
| 35 | FC29-009744A | Holder sensor             | Aluminum 6063                       | ETC       |
| 36 | XXxx-xxxxxxA | 열상 센서                     | Complex (Electric parts)            | A         |
| 37 | FC28-000730A | PAD thermal               | Thermal conductive silicone         | ETC       |
| 38 | FC29-009746A | Holder push sensor        | Aluminum 5052-h32                   | PD        |
| 39 | XXxx-xxxxxxA | PBA sensor                | Complex (Electric parts)            | A         |
| 40 | XXxx-xxxxxxA | PBA NUC                   | Complex (Electric parts)            | A         |

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**Attachment 2 – Parts List**

|     |              |                          |                             |     |
|-----|--------------|--------------------------|-----------------------------|-----|
| 41  | FC29-009743A | Holder camera for 19&35  | ADC12                       | DC  |
| 42  | XXxx-xxxxxxA | PBA power                | Complex (Electric parts)    | A   |
| 43  | FC29-009747A | Holder PBA network power | SAMYANG 3500G20 - V0        | MD  |
| 44  | XXxx-xxxxxxA | PBA network              | Complex (Electric parts)    | A   |
| 45  | FC28-000556A | PAD thermal              | Thermal conductive silicone | ETC |
| 46  | EP07-001237A | Heat sink                | ADC12                       | DC  |
| S-1 | Z6001055201A | Screw machine            | SWCH18A                     | SC  |
| S-2 | FC18-004515A | Screw set                | SUS                         | SC  |
| S-3 | Z6003007801A | Screw machine (for 방수)   | SWCH18A                     | SC  |
| S-4 | Z6004041101A | Screw set                | SUS                         | SC  |
| S-5 | Z6011000601A | Screw machine            | SUS                         | SC  |
| S-6 | FC18-003309A | Screw machine            | SUS                         | SC  |
| S-7 | Z9642306007  | Screw machine (for wire) | SWCH18A                     | SC  |
| S-8 | FC18-003435A | Screw machine            | SWCH18A                     | SC  |
| S-9 | Z6003012201A | Screw taptite            | SWCH18A                     | SC  |

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**Attachment 2 – Parts List****SolutionPartner****ASA LI936B**

Injection Molding Grade

**Description**

Flame Retardant, Good Weatherability

**Application**

Bidet housing

| Properties                         | Test Condition | Test Method | Unit               | Typical Value |
|------------------------------------|----------------|-------------|--------------------|---------------|
| <b>Physical</b>                    |                |             |                    |               |
| Specific Gravity                   |                | ASTM D792   | -                  | 1.17          |
| Molding Shrinkage (Flow), 3.2mm    |                | ASTM D955   | %                  | 0.4~0.7       |
| Melt Flow Rate                     | 220°C/10kg     | ASTM D1238  | g/10min            | 30            |
| <b>Mechanical</b>                  |                |             |                    |               |
| Tensile Strength, 3.2mm            |                | ASTM D638   |                    |               |
| @ Yield                            | 50mm/min       |             | kg/cm <sup>2</sup> | 350           |
| Tensile Elongation, 3.2mm          |                | ASTM D638   |                    |               |
| @ Yield                            | 50mm/min       |             | %                  | 5             |
| @ Break                            | 50mm/min       |             | %                  | Min 15        |
| Tensile Modulus, 3.2mm             | 1mm/min        | ASTM D638   | kg/cm <sup>2</sup> | 20,000        |
| Flexural Strength, 6.4mm           | 15mm/min       | ASTM D790   | kg/cm <sup>2</sup> | 550           |
| Flexural Modulus, 6.4mm            | 15mm/min       | ASTM D790   | kg/cm <sup>2</sup> | 18,000        |
| IZOD Impact Strength, 6.4mm        |                | ASTM D256   |                    |               |
| (Notched)                          | 23°C           |             | kg-cm/cm           | 12            |
|                                    | -30°C          |             | kg-cm/cm           | 5             |
| IZOD Impact Strength, 3.2mm        |                | ASTM D256   |                    |               |
| (Notched)                          | 23°C           |             | kg-cm/cm           | 19            |
|                                    | -30°C          |             | kg-cm/cm           | 6             |
| Rockwell Hardness                  | R-Scale        | ASTM D785   | -                  | 85            |
| <b>Thermal</b>                     |                |             |                    |               |
| Heat Deflection Temperature, 6.4mm |                | ASTM D648   |                    |               |
| (Unannealed)                       | 18.6kg         |             | °C                 | 80            |
|                                    | 4.6kg          |             | °C                 | 87            |
| Vicat Softening Temperature        |                | ASTM D1525  |                    |               |
|                                    | 5kg, 50°C/h    |             | °C                 | 86            |
|                                    | 1kg, 120°C/h   |             | °C                 |               |
| Flammability                       |                | UL94        |                    |               |
| 2.0mm                              |                |             | class              | V-0           |
| 3.0mm                              |                |             | class              | V-0           |
| Relative Temperature Index         |                | UL 746B     |                    |               |
| Electrical                         |                |             | °C                 | 50            |
| Mechanical with Impact             |                |             | °C                 | 50            |
| Mechanical without Impact          |                |             | °C                 | 50            |

(Note) Typical values are only for material selection purpose, and variation within normal tolerances are for various colors.

Values given should not be interpreted as specification and not be used for part or tool design.

All properties, except melt flow rate are measured on injection moulded specimens and after 48 hours storage at 23°C, 50% relative humidity.

Updated : 22-May-17

The information contained herein, including, but not limited to, data, statements and typical values, are given in good faith. LG Chem makes no warranty or guarantee, expressed or implied, (i) that the result described herein will be obtained under end - use conditions, or (ii) as to the effectiveness or safety of any design incorporating LG Chem materials, products, recommendations or advice. Further, any information contained herein shall not be construed as a part of legally binding offer. Especially, the typical values should be regarded as reference values only and not as binding minimum values. Each user bear full responsibility for making its own determination as to the suitability of LG Chem's materials, products, recommendations, or advice for its own particular use. Each user must identify and perform all tests and analyses necessary to assure that its finished parts incorporating LG Chem material or products will be safe and suitable for use under end - use conditions. The data contained herein can be changed without notice as a result of the quality improvement of the products.

**Processing Guide (Injection Molding)**



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### Attachment 2 – Parts List

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<br>(mm) | Flame<br>Class | HWI | HAI | RTI<br>Elec | RTI<br>Imp | RTI<br>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 (10<sup>8</sup> 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 <sup>2</sup> | -        | -              |
| ISO Izod Impact                | ISO 180                          | kJ/m <sup>2</sup> | -        | -              |
| ISO Charpy Impact              | ISO 179-2                        | kJ/m <sup>2</sup> | -        | -              |

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

File Number: E121254

**SAMYANG CORPORATION**

407 3-Ga Palbok-Dong, Cheonju Cheonbuk 560-200 KR

**TRIEX: 3500G-(z)**

Polycarbonate (PC), pellets

(z) - Represents any number 20-29 incl.

| Flammability                          | Value  |
|---------------------------------------|--------|
| Flame Rating                          |        |
| 1.5 mm, ALL                           | V-0    |
| 3.0 mm, ALL                           | V-0    |
| 6.0 mm, ALL                           | V-0    |
| Electrical                            | Value  |
| Hot-wire Ignition (HWI)               |        |
| 1.5 mm                                | PLC 2  |
| 3.0 mm                                | PLC 1  |
| 6.0 mm                                | PLC 0  |
| High Amp Arc Ignition (HAI)           |        |
| 1.5 mm                                | PLC 0  |
| 3.0 mm                                | PLC 0  |
| 6.0 mm                                | PLC 0  |
| Comparative Tracking Index (CTI)      | PLC 3  |
| High Voltage Arc Tracking Rate (HVTR) | PLC 3  |
| Arc Resistance                        | PLC 7  |
| Thermal                               | Value  |
| RTI Elec                              |        |
| 1.5 mm                                | 130 °C |
| 3.0 mm                                | 130 °C |
| 6.0 mm                                | 130 °C |



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### Attachment 3 – Photographs

<Photo 1 > Test Unit



<Photo 2 > Test Unit





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### Attachment 3 – Photographs

<Photo 3 > Hose down test



<Photo 4 > Test Result





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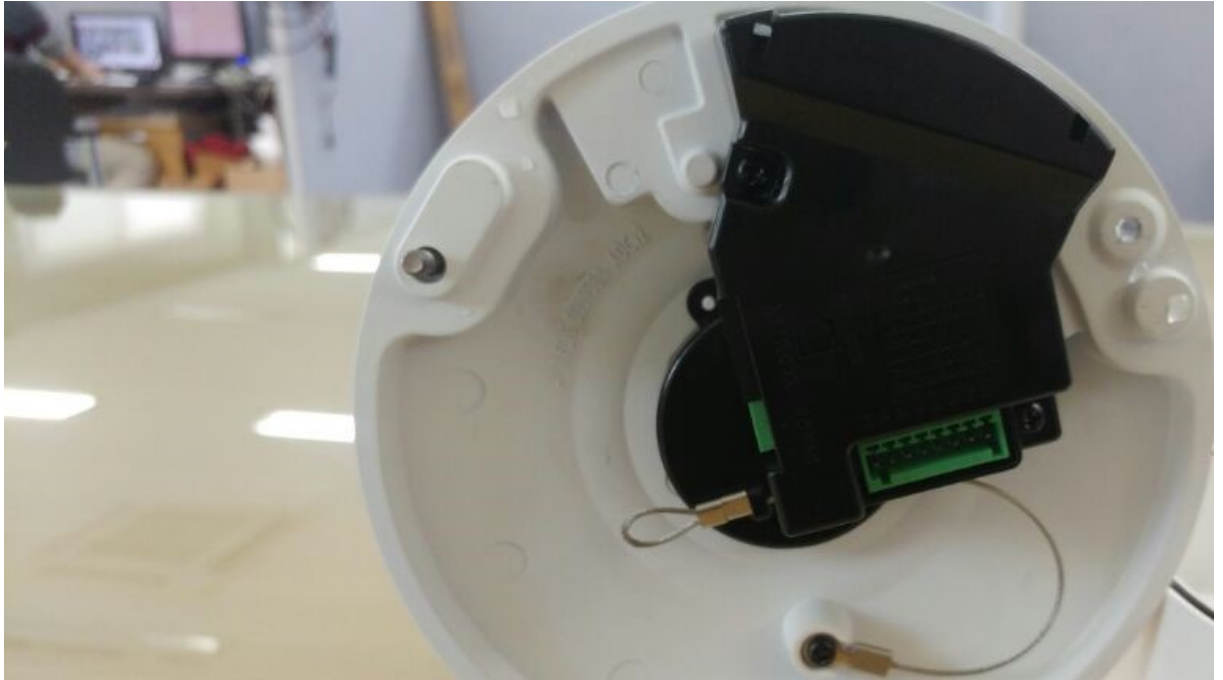
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### Attachment 3 – Photographs

#### <Photo 5 > Test Result



#### <Photo 6 > Test Result





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### Attachment 3 – Photographs

#### <Photo 7 > Test Result

