



TEST REPORT
IEC 60598-2-24
Luminaires
Part 2: Particular requirements
Section 24: Luminaires with limited surface temperature

Report Number.....: LCS190517033BS
Date of issue.....: June 14, 2019
Total number of pages.....: 11 pages

Name of Testing Laboratory preparing the Report.....: **Shenzhen Southern LCS Compliance Testing Laboratory Ltd.**

Applicant's name.....: **Fulton Science and Technology Lighting Co., Ltd**

Address.....: 7F, Building 17, Area C, Liantang Industrial Town, Shangcun Community, Gongming, Guangming New District, Shenzhen, Guangdong Province, China.

Test specification:

Standard.....: IEC 60598-2-24:2013 used in conjunction with IEC 60598-1:2014+A1:2017

Test procedure.....: Test Report

Non-standard test method.....: N/A

Test Report Form No.....: IEC60598_2_24G

Test Report Form(s) Originator.....: Intertek Semko AB

Master TRF.....: 2018-04

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Shenzhen Southern LCS Compliance Testing Laboratory Ltd.

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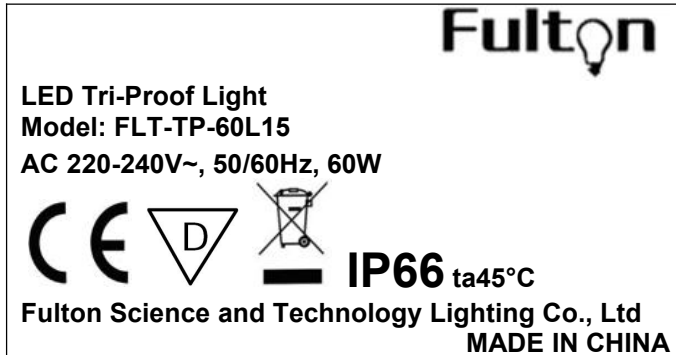
| | | |
|--|--|--|
| Test item description : | LED Tri-Proof Light | |
| Trade Mark : | | |
| Manufacturer : | Fulton Science and Technology Lighting Co., Ltd | |
| Address : | 7F, Building 17, Area C, Liantang Industrial Town, Shangcun Community, Gongming, Guangming New District, Shenzhen, Guangdong Province, China. | |
| Model/Type reference : | See model list on page 5 | |
| Ratings : | AC 220-240V~, 50/60Hz, ta.45°C, IP66, detail see model list on page 5 | |
| <input type="checkbox"/> Testing Laboratory: | | |
| Testing location/ address : | Shenzhen Southern LCS Compliance Testing Laboratory Ltd. B Area, 1-2F, Building B, Zhongyu Green High-tech Industrial Park, Wenge Road, Heshuikou, Gongming Street, Guangming New District, Shenzhen, China | |
| Tested by : | Lydia Luo (Engineer) | |
| Check by : | Eko Yang (Director) | |
| Approved by : | Jesse Liu (Manager) | |
| List of Attachments (including a total number of pages in each attachment): Attachment No. 1: 9 pages of photo documentation. | | |
| Summary of testing: | | |
| Tests performed (name of test and test clause): This product has obtained CE certification, so this report only evaluates clauses 24.13 and 24.14 of IEC 60598-2-24. | Testing location: Shenzhen Southern LCS Compliance Testing Laboratory Ltd. B Area, 1-2F, Building B, Zhongyu Green High-tech Industrial Park, Wenge Road, Heshuikou, Gongming Street, Guangming New District, Shenzhen, China | |
| Summary of compliance with National Differences: List of countries addressed EN 60598-2-24: 2013; EN 60598-1: 2015+A1:2018 | | |

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Copy of marking plate:

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBs that own these marks.

**Remarks:**

1. Representative markings of FLT-TP-60L15, markings of all models are identical except for the model name and rating.
2. Height of CE mark at least 5mm, height of WEEE symbol should not less than 7mm, height of other marks at least 5mm, height of letters and numerals at least 2mm.

According to the EU directives which have been aligned with EU NLF (new legislative framework), both of manufacturer and importer's name and address shall be affixed on the product or, where that is not possible, on its packaging or in a document accompanying the product before the product is placed on the EU market.

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| Test item particulars : | | | | | | | | | |
|---|--|---------------|------------------|---------------|---------|------|----------------|---|------------------|
| Classification of installation and use : | Fixed luminaires for indoor and outdoor use | | | | | | | | |
| Supply Connection : | Supply cord | | | | | | | | |
| Protection Class : | Class I | | | | | | | | |
| Degree of Protection : | IP66 | | | | | | | | |
| 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) | | | | | | | | | |
| Testing : | | | | | | | | | |
| Date of receipt of test item : | May 18, 2019 | | | | | | | | |
| Date (s) of performance of tests : | May 18, 2019 - June 14, 2019 | | | | | | | | |
| | | | | | | | | | |
| General remarks: | | | | | | | | | |
| <p>This report shall not be reproduced except in full without the written approval of the testing laboratory. The test results presented in this report relate only to the item tested. "(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report.</p> <p>Throughout this report a <input checked="" type="checkbox"/> comma / <input type="checkbox"/> point is used as the decimal separator.</p> <p style="text-align: center;">Modified Information</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;">Version</th> <th style="width: 25%;">Report No.</th> <th style="width: 25%;">Revision Date</th> <th style="width: 25%;">Summary</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">V1.0</td> <td style="text-align: center;">LCS190517033BS</td> <td style="text-align: center;">/</td> <td style="text-align: center;">Original Version</td> </tr> </tbody> </table> | | Version | Report No. | Revision Date | Summary | V1.0 | LCS190517033BS | / | Original Version |
| Version | Report No. | Revision Date | Summary | | | | | | |
| V1.0 | LCS190517033BS | / | Original Version | | | | | | |
| Manufacturer's Declaration per sub-clause 4.2.5 of IEC 60529: | | | | | | | | | |
| The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided..... : | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> Not applicable | | | | | | | | |
| When differences exist; they shall be identified in the General product information section. | | | | | | | | | |
| Name and address of factory (ies) : Same as applicant's name & address | | | | | | | | | |

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**General product information:**

Product: LED Tri-Proof Light

Rating: AC 220-240V, 50/60Hz, ta=45°C, IP66, Class I, suitable for direct mounting on normally flammable surfaces, for indoor and outdoor use.

- All models have similar construction except for the size and power.

- Unless otherwise specified, the model FLT-TP-60L15 was chosen as representative model to perform all test.

Model List:

| Model | Rating | Case size LxWxH (mm) |
|--------------|---|-------------------------|
| FLT-TP-12L6 | 220-240V~, 50/60Hz, 12W, IP66, ta:45°C, Class I | 590x95x75 |
| FLT-TP-14L6 | 220-240V~, 50/60Hz, 14W, IP66, ta:45°C, Class I | 590x95x75 |
| FLT-TP-17L6 | 220-240V~, 50/60Hz, 17W, IP66, ta:45°C, Class I | 590x95x75 |
| FLT-TP-20L6 | 220-240V~, 50/60Hz, 20W, IP66, ta:45°C, Class I | 590x95x75 |
| FLT-TP-25L12 | 220-240V~, 50/60Hz, 25W, IP66, ta:45°C, Class I | 1190x95x75 |
| FLT-TP-30L12 | 220-240V~, 50/60Hz, 30W, IP66, ta:45°C, Class I | 1190x95x75 |
| FLT-TP-35L12 | 220-240V~, 50/60Hz, 35W, IP66, ta:45°C, Class I | 1190x95x75 |
| FLT-TP-40L12 | 220-240V~, 50/60Hz, 40W, IP66, ta:45°C, Class I | 1190x95x75 |
| FLT-TP-35L15 | 220-240V~, 50/60Hz, 35W, IP66, ta:45°C, Class I | 1490x95x75 |
| FLT-TP-40L15 | 220-240V~, 50/60Hz, 40W, IP66, ta:45°C, Class I | 1490x95x75 |
| FLT-TP-50L15 | 220-240V~, 50/60Hz, 50W, IP66, ta:45°C, Class I | 1490x95x75 |
| FLT-TP-60L15 | 220-240V~, 50/60Hz, 60W, IP66, ta:45°C, Class I | 1490x95x75 |


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| IEC 60598-2-24 | | | |
|----------------|---|---|------------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 24.5 | CLASSIFICATION | | P |
| | Luminaires shall be classified in accordance with the provisions of Section 2 of IEC 60598-1 | Class I | P |
| | a) Luminaire where no unusual accumulation of dust is expected | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | — |
| | b) Luminaire where an accumulation of non-conductive dust may be expected | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | — |
| | c) Luminaire where an accumulation of conductive dust may be expected | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | — |
| 24.6 | MARKING | | P |
| | The provisions of Section 3 of IEC 60598-1 apply together with the following requirements | | P |
| 24.6.1 (-) | Symbol for luminaire with limited surface temp. | | P |
| | Marking visible |  | P |
| 24.6.2 (-) | Classification of the luminaire according 24.5 in manufacturers literature | | P |
| 24.7 | CONSTRUCTION | | P |
| | The provisions of Section 4 of IEC 60598-1 apply, together with the requirements of 24.7.1 and 24.7.2 below | | P |
| 24.7.1 (-) | Degree of protection | | P |
| | IP4X at least | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | N/A |
| | IP5X if presence of dust | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | N/A |
| | IP6X if presence of conductive dust | Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | P |
| | At least IP 5X or IP6X for certain locations according IEC 60364-4-42 | | P |
| 24.7.2 (-) | Applicable surfaces comply with requirements of horizontal surfaces | | P |
| | Vertical surfaces not complying with spacing requirements in 24.13 comply with the limits for horizontal surfaces | | P |
| 24.8 | CREEPAGE DISTANCES AND CLEARANCES | | N/A |
| | The provisions of Section 11 of IEC 60598-1 apply | | N/A |

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| IEC 60598-2-24 | | | |
|----------------|---|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 24.9 | PROVISION FOR EARTHING | | N/A |
| | The provisions of Section 7 of IEC 60598-1 apply | | N/A |
| 24.10 | TERMINALS AND ELECTRICAL CONNECTIONS | | N/A |
| | The provisions of Sections 14 and 15 of IEC 60598-1 apply | | N/A |
| 24.11 | EXTERNAL AND INTERNAL WIRING | | N/A |
| | The provisions of Section 5 of IEC 60598-1 apply | | N/A |
| 24.12 | PROTECTION AGAINST ELECTRIC SHOCK | | N/A |
| | The provisions of Section 8 of IEC 60598-1 apply | | N/A |
| 24.13 | ENDURANCE TEST AND THERMAL TEST | | P |
| | If IP > IP 20 relevant test of (12.4), (12.5) and (12.6) after (9.2) before (9.3) specified in 24.14 | | — |
| | The provisions of Section 12 of IEC 60598-1 apply, together with the requirements of 24.13.1 to 24.13.3 below | | N/A |
| 24.13 (-) | Temperature limit for vertical surfaces with gap < 30 mm | (see Annex 1) | P |
| 24.13.1 (-) | Special temperature limits – normal operation | (see Annex 1) | P |
| 24.13.2 (-) | Special temperature limits – abnormal operation | (see Annex 1) | P |
| 24.13.3 (-) | Special temperature limits – fault conditions | (see Annex 1) | N/A |
| 24.14 | RESISTANCE TO DUST AND MOISTURE | | P |
| | The order of tests as specified in clause 24.13 | | P |
| | The provisions of Section 9 of IEC 60598-1 apply | IP66 | P |
| 24.15 | INSULATION RESISTANCE AND ELECTRIC STRENGTH | | N/A |
| | The provisions of Section 10 of IEC 60598-1 apply | | N/A |
| 24.16 | RESISTANCE TO HEAT, FIRE AND TRACKING | | N/A |
| | The provisions of Section 13 of IEC 60598-1 apply | | N/A |

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| IEC 60598-2-24 | | | |
|----------------|--------------------|-----------------|---------|
| Clause | Requirement + Test | Result - Remark | Verdict |

| ANNEX 1 | TABLE: Temperature measurements, thermal tests of Section 12 | | P |
|---------|--|--|---|
| | Type reference..... | FLT-TP-60L15 | — |
| | Lamp used..... | LED module | — |
| | Lamp control gear used..... | ELEMENT60/220-240/350 D CS L | — |
| | Mounting position of luminaire..... | According to instruction from manufacturer | — |
| | Supply wattage (W)..... | 60,2W | — |
| | Supply current (A)..... | 0,253A | — |
| | Calculated power factor..... | 0,989 | — |
| | Table: measured temperatures corrected for ta = 45 °C: | | |
| | - abnormal operating mode..... | LED driver output short circuit | — |
| | - test 1: rated voltage..... | -- | — |
| | - test 2: 1,06 times rated voltage or 1,05 times rated wattage..... | U=1,06x240=254,4V | — |
| | - test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage..... | -- | — |
| | - test 4: 1,1 times rated voltage or 1,05 times rated wattage..... | LED driver protection immediately | — |
| | Through wiring or looping-in wiring loaded by a current of A during the test | -- | — |

| Temperature measurements, (°C) | | | | | | | |
|--|---------|----------------------|--------|--------|-------|------------------------|-------|
| Part | Ambient | Clause 12.4 – normal | | | | Clause 12.5 – abnormal | |
| | | test 1 | test 2 | test 3 | limit | test 4 | limit |
| Supply cords | 45°C | -- | 53,7 | -- | 90 | -- | -- |
| LED PCB | 45°C | -- | 74,1 | -- | 130 | -- | -- |
| tc of LED driver | 45°C | -- | 73,5 | -- | 75 | -- | -- |
| Horizontal side of enclosure | 45°C | -- | 60,1 | -- | 110 | -- | -- |
| Vertical side of enclosure | 45°C | -- | 62,3 | -- | 150 | -- | -- |
| Vertical side of enclosure which near the wall | 45°C | -- | 59,3 | -- | 90 | -- | -- |
| Mounting surface | 45°C | -- | 58,1 | -- | 90 | -- | -- |

Supplementary information:



Attachment No.1

Photo Documentation

View:
Model:
FLT-TP-60L15
General
Front
Rear
Internal
Top
Bottom
PWB

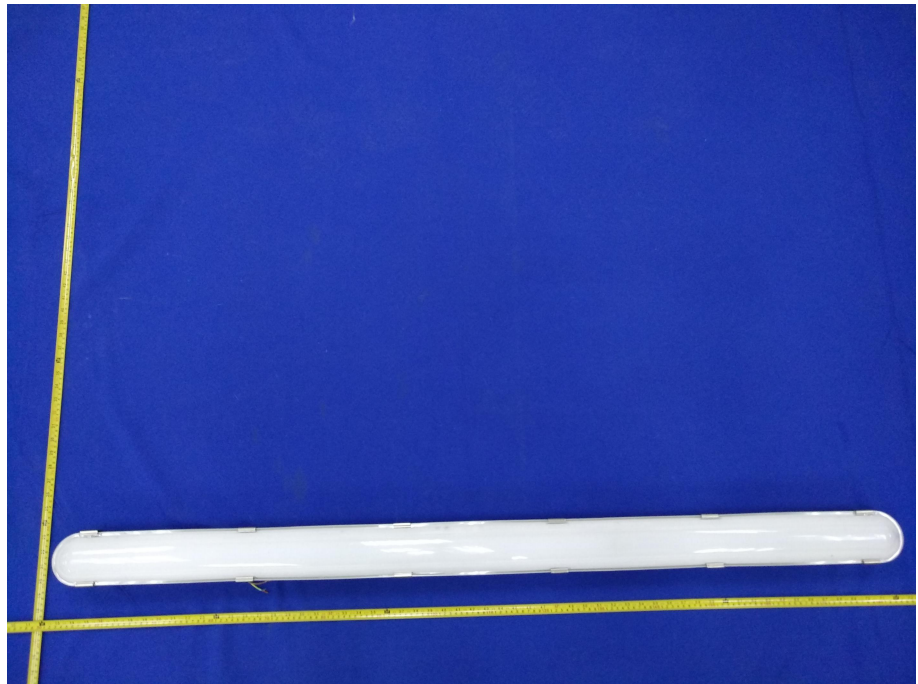


Figure 1

View:
General
Front
Rear
Internal
Top
Bottom
PWB

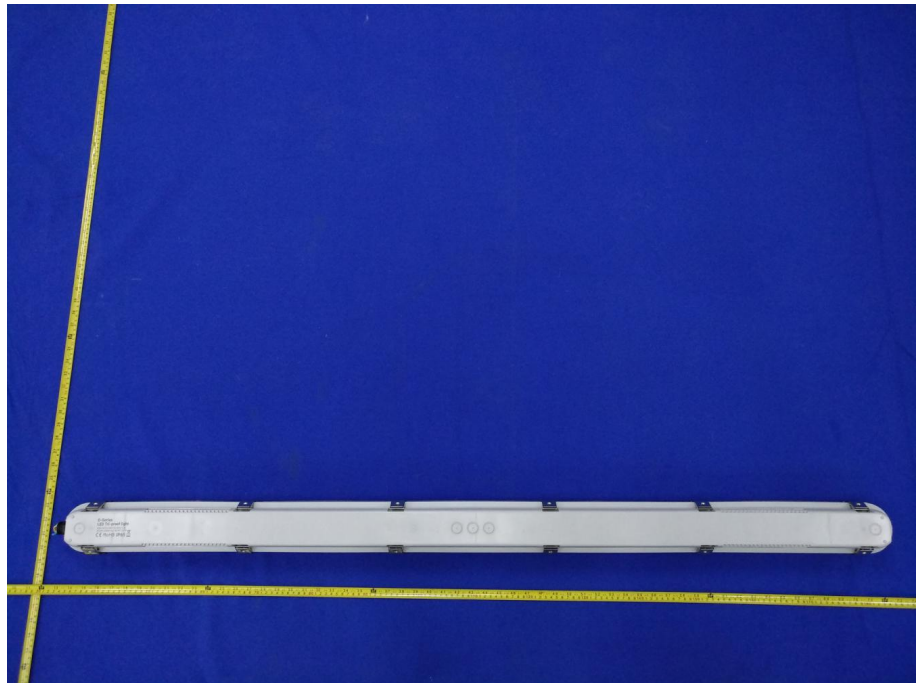


Figure 2

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Attachment No.1

Photo Documentation

View:

- General
- Front
- Rear
- Internal
- Top
- Bottom
- PWB

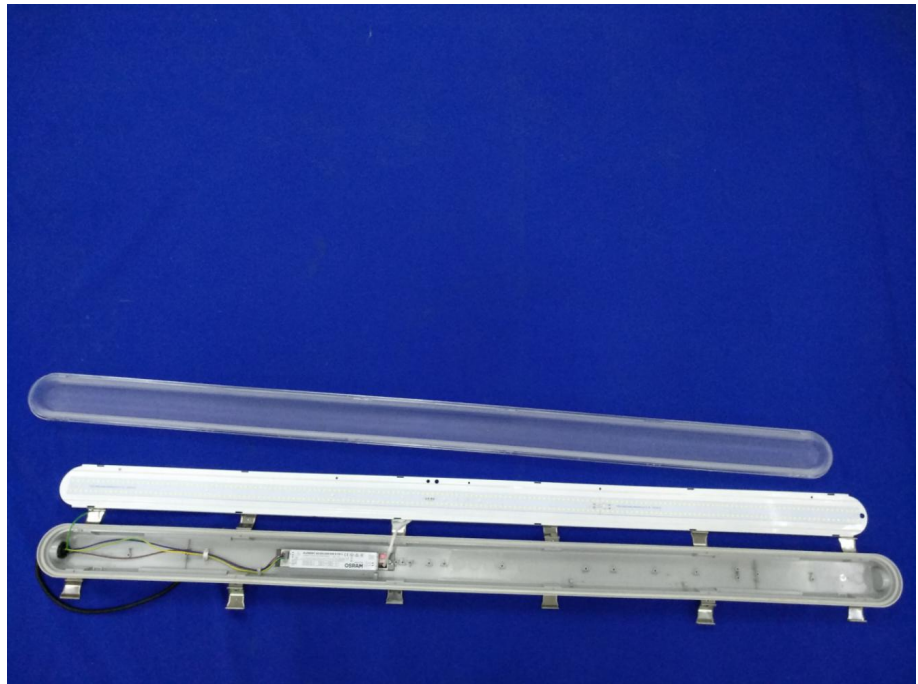


Figure 3

View:

- General
- Front
- Rear
- Internal
- Top
- Bottom
- PWB



Figure 4

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Attachment No.1

Photo Documentation

View:

- General
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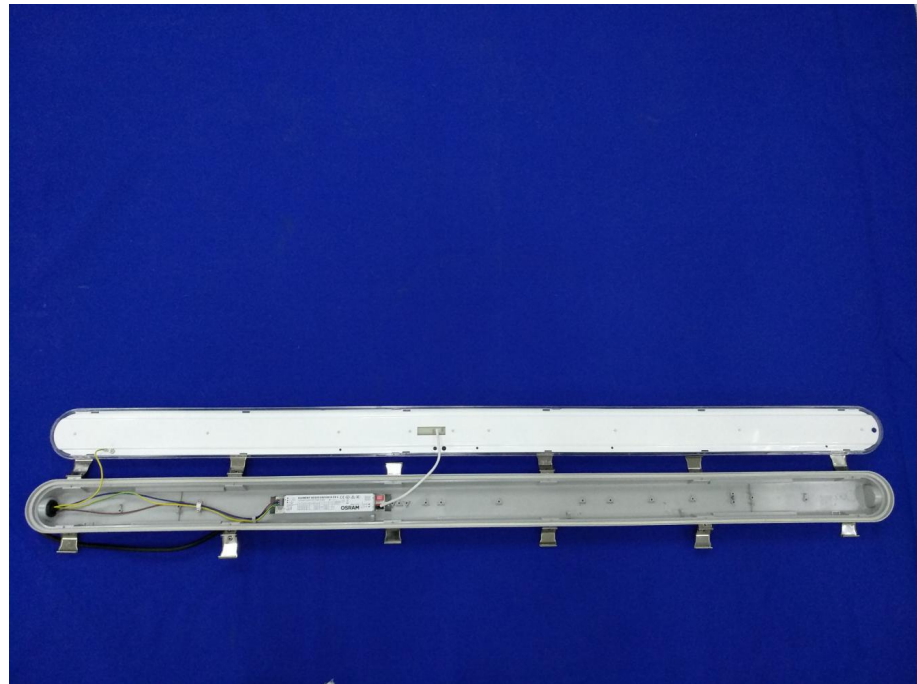


Figure 5

View:

- General
- Front
- Rear
- Internal
- Top
- Bottom
- PWB



Figure 6

-----End of Test Report-----

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