# TEST REPORT
# IEC 61347-2-13
# Part 2: Particular requirements:
# Section 13 – d.c. or a.c. supplied electronic controlgear for LED modules

| | |
|---|---|
| **Report Number.....:** | 64.140.15.04464.04 |
| **Date of issue .....:** | 2018-10-10 |
| **Total number of pages.....** | 36 pages (excluded attachments) |
| **Name of Testing Laboratory preparing the Report.....:** | TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch |
| **Applicant's name .....:** | Yongzhou TAIJU Electronics Co., Ltd. |
| **Address .....:** | Standard Factory Building C, Tuojiang Town, Jianghua Yao Autonomous County, Yongzhou, Hunan, China. |
| **Test specification:** | |
| **Standard.....:** | IEC 61347-2-13:2014/AMD1:2016 used in conjunction with IEC 61347-1:2015 |
| **Test procedure.....:** | GS+TUV MARK+CE(LVD) |
| **Non-standard test method……..:** | N/A |
| **Test Report Form No. .....:** | IEC61347_2_13F |
| **Test Report Form(s) Originator ....:** | Intertek Semko AB |
| **Master TRF .....:** | 2016-10 |



If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

**This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.**

**General disclaimer:**

The test results presented in this report relate only to the object tested.
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Telefax : +86 20 38320478
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| | |
|---|---|
| **Test item description..... :** | LED driver |
| **Trade Mark..... :** | TAIJU |
| **Manufacturer ..... :** | Same as applicant |
| **Model/Type reference..... :** | TJ-GSxxVzW-yyyy, TJ-GSxxVuuW-yyyy ("xx"=03-36 stands for output voltage range in step of 1V; "yyyy"=0110-1600 stands for output current range in step of 1mA; "z"=1-9, "uu"=10-15, "z" and "uu" stand for output power range in step of 1W). |
| **Ratings..... :** | 220-240 VAC, 50/60 Hz, others for details see "Test item particulars" in page 5 and "General product information" in page 6. |

| **Responsible Testing Laboratory (as applicable), testing procedure and testing location(s):** | | | |
|---|---|---|---|
| ☒ | **Testing Laboratory:** | TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch | |
| **Testing location/ address ..... :** | | 5F, Communication Building, 163 Pingyun Rd, Huangpu Ave. West Guangzhou, 510656 P. R. China | |
| **Tested by (name, function, signature)..... :** | | Ian Pan<br>Project Handler | |
| **Approved by (name, function, signature) .. :** | | Kenny Chen<br>Designated Reviewer | |



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

This test report contains total of 105 pages, including attachments and photo document which consist of:

Attachment No.1: EN deviation of IEC 61347-1:2015 and IEC 61347-2-13:2014+A1:2016 (1 page).

Attachment No.2: Part of EN 60598-1:2015 (8 pages).

Attachment No.3: EN 62493:2015 (1 page).

Attachment No.4: VDE0620-2-1:2013 and VDE0620-1:2013 (41 pages).

Attachment No.5: EK1_557-13_Attachment_plug-in_power_supplies (1 page).

Attachment No.6: Evaluation of PAH (1 page).

Photo documentation (16 pages).

**Summary of testing:**

| **Tests performed (name of test and test clause):** | **Testing location:** |
|---|---|
| - EN 61347-2-13:2014+A1:2017<br>- EN 61347-1:2015<br>The submitted samples were found to comply with the requirements of above specification.<br><br>Part of EN 60598-1:2015 was considered, see attachment 2.<br>EN 62493:2015 was considered, see attachment 3.<br>VDE0620-2-1:2013 and VDE0620-1:2013 were considered, see attachment 4.<br>EK1_557-13 was considered, see attachment 5.<br>AfPS GS 2014:01 PAK was considered, see attachment 6.<br><br>Add model for this report, it was based on previous report: 64.140.15.04464.03.<br>Add models: TJ-GSxxVzW-yyyy, TJ-GSxxVuuW-yyyy ("xx"=03-04 stands for output voltage range in step of 1V), new model have same construction with old models, no more test needed.<br><br>TJ-GS05V4W-0800 and TJ-GS05V8W-1600 and TJ-GS12V15W-1250 were subjected to full test; TJ-GS36V4W-0111 and TJ-GS36V8W-0222 were subjected particular test. | TÜV SÜD Certification and Testing (China) Co., Ltd. Guangzhou Branch<br>5F, Communication Building, 163 Pingyun Rd, Huangpu Ave. West Guangzhou, 510656 P. R. China. |

**Summary of compliance with National Differences:**

EN 61347-2-13:2014+A1:2017

EN 61347-1:2015



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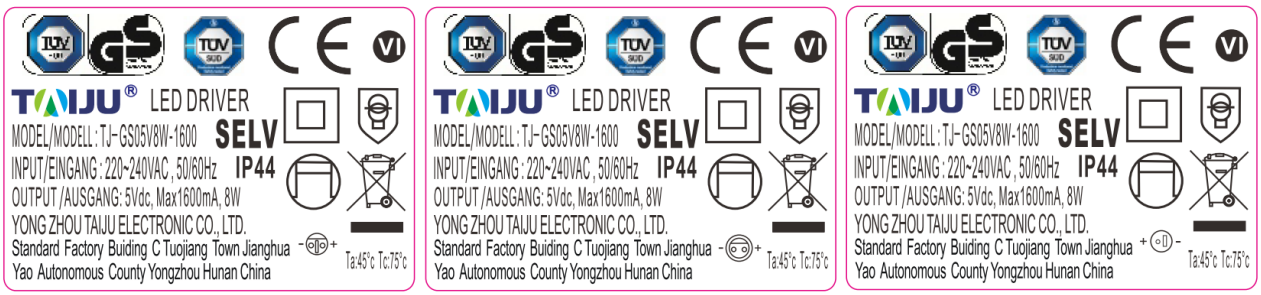
**Copy of marking plate**

Label format of TJ-GS05V8W-1600 model for representative, other models of the same construction have similar format. There are three kinds of output connector for each model:




Importer name: XXX
Importer address: XXX

Location: affixed on the driver enclosure;

Remark: height of numbers and letters at least 2mm, height of WEEE mark at least 7mm, height of other marks at least 5mm.

According to the German product safety law (ProdSG), the name and address of manufacturer (an EU-based importer or authorized representative if the manufacturer is not based in EU) 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;

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 ..... :** | Power Supply (LED driver) |
| **Classification of installation and use..... :** | Independent |
| **Supply Connection ..... :** | Direct plug-in |
| **..... :** | |
| **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 ..... :** | 2018-01-16<br>2018-09-13 |
| **Date (s) of performance of tests..... :** | 2018-01-17 to 2018-03-20<br>2018-09-13 to 2018-10-10 |

**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 IEC 61347-1**

**The manufacturer and importer have to ensure the appliances conform to other associated council directives and law, such as EMC, WEEE, RoHs, ErP, etc.**

**Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:**

| | |
|---|---|
| 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 ..... : | ☐ **Yes**<br>☒ **Not applicable** |

**When differences exist; they shall be identified in the General product information section.**

| | |
|---|---|
| **Name and address of factory (ies) ..... :** | Yongzhou TAIJU Electronics Co., Ltd.<br>Standard Factory Building C, Tuojiang Town, Jianghua Yao Autonomous County, Yongzhou, Hunan, China. |



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**General product information:**

The products are Class II plug-in driver.

The protection against electric shock not rely upon the enclosure of luminaires or other appliance which comply with the relevant standards.

IP classification: IP44.

Output type: constant voltage type, SELV.

Ta: 45ºC.

Tc: 75ºC.

Rated output:

3-36V, 110-1600mA, 1-15W.

Models difference:

1-4W series models and 5-8W series models and 9-15W series models have same construction except electric circuit and PCB-layout.

1-4W series models are same except output.

5-8W series models are same except output.

9-15W series models are same except output.



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| IEC 61347-2-13 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| 4 (4) | GENERAL REQUIREMENTS | | P |
|---|---|---|---|
| - (4) | Insulation materials according requirements in Annex N of IEC 61347-1 | (see Annex N) | P |
| - (4) | Compliance of independent controlgear enclosure with IEC 60 598-1 | | P |
| - (4) | Built-in electronic controlgear with double or reinforced insulation comply with Annex O of IEC 61347-1 | (see Annex O) | N/A |
| 4 (4) | SELV controlgear comply with Annex I of this part 2 and Annex L of IEC 61347-1 | (see Annex L) | P |
| 4 (-) | Transformer comply with IEC 61558 | | P |
| | Dielectric strength test of insulated winding wires is limited to 3 kV if input voltage ≤ 300 V | | P |

| 6 (6) | CLASSIFICATION | | P |
|---|---|---|---|
| | Built-in controlgear .....: | Yes ☐ No ☒ | — |
| | Independent controlgear .....: | Yes ☒ No ☐ | — |
| | Integral controlgear .....: | Yes ☐ No ☒ | — |
| 6 (-) | Auto-wound controlgear .....: | Yes ☐ No ☒ | — |
| | Separating controlgear .....: | Yes ☐ No ☒ | — |
| | Isolating controlgear .....: | Yes ☐ No ☒ | — |
| | SELV controlgear .....: | Yes ☒ No ☐ | — |

| 7 (7) | MARKING | | P |
|---|---|---|---|
| **7.1 (7.1)** | **Mandatory markings** | | **P** |
| | a) mark of origin | | P |
| | b) model number or type reference | | P |
| | c) symbol for independent controlgear, if applicable | | P |
| | d) correlation between interchangeable parts and controlgear marked | | N/A |
| | e) rated supply voltage (V) | 220-240V~ | P |
| | supply frequency (Hz) | 50/60Hz | P |
| | supply current (A) | | N/A |
| | f) earthing symbol | | N/A |



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| IEC 61347-2-13 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | k) wiring diagram | | P |
| | l) value of tc | | P |
| | m) symbol for declared temperature | | N/A |
| | t) LUM earthing symbol | | N/A |
| | u) if not SELV maximum working voltage $U_{out}$ between: | | N/A |
| | - output terminals (V) .....: | -- | N/A |
| | - output terminals and earth (V) .....: | -- | N/A |
| 7.1 (-) | Constant voltage type: | Yes ☒ No ☐ | — |
| | - rated output power $P_{rated}$ (W) .....: | See "General product information" in page 6 | P |
| | - rated output voltage $U_{rated}$ (V) .....: | See "General product information" in page 6 | P |
| | Constant current type: | Yes ☐ No ☒ | — |
| | - rated output power $P_{rated}$ (W) .....: | | N/A |
| | - rated output current $I_{rated}$ (A) .....: | | N/A |
| | Indication if for LED modules only | | P |
| 7.1 (7.2) | Marking durable and legible | | P |
| | Rubbing 15 s water, 15 s petroleum; marking legible | | P |
| **7.2 (7.1)** | **Information to be provided, if applicable** | | **P** |
| | h) declaration of protection against accidental contact | | P |
| | i) cross-section of conductors (mm²) | | N/A |
| | j) number, type and wattage of lamp(s) | | P |
| | s) SELV symbol | | P |
| 7.2 (-) | - declaration of mains connected windings | | N/A |

| | | | |
|---|---|---|---|
| **8 (10)** | **PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS** | | **P** |
| - (10.1) | Controlgear protected against accidental contact with live parts | | P |
| - (A2) | Voltage measured with 50 kΩ | (see Annex A) | P |
| - (A3) | Voltage > 35 V peak or > 60 V d.c. or protective impendance device | (see Annex A) | N/A |
| - (10.1) | Lacquer or enamel not used for protection or insulation | | P |



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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Adequate mechanical strength on parts providing protection | | P |
| - (10.2) | Capacitors > 0,5 μF: voltage after 1 min (V):<br>< 50 V .....: | <10V | P |
| **- (10.3)** | **Controlgear providing SELV** | | **P** |
| | Accessible conductive parts are insulated from live parts by double or reinforced insulation in SELV controlgear | | P |
| | No connection between output circuit and the body or protective earthing circuit | | N/A |
| | No possibility of connection between output circuit and the body or protective earthing circuit through other conductive parts | | N/A |
| | SELV outputs separated by at least basic insulation | | N/A |
| | ELV conductive parts insulated as live parts | | N/A |
| | Tests according Annex L of IEC 61347-1 | (see Annex L) | P |
| **- (10.4)** | **Accessible conductive parts in SELV circuits** | | **P** |
| | Output voltage under load ≤ 25 V r.m.s. or ≤ 60 V d.c. | | P |
| | If output voltage > 25 V r.m.s. or > 60 V d.c.;<br>No load output ≤ 35 V peak or ≤ 60 V d.c and touch current does not exceed 0,7 mA (peak) or 2 mA d.c. .....: | | N/A |
| | One conductive part is insulated if output voltage or current exceeding the values above and withstand test voltage 500 V | | N/A |
| | Double or reinforced insulation bridged by appropriate and at least two resistors or two Y2 capacitors or one Y1 capacitor | One Y1 capacitor | P |
| | Y1 or Y2 capacitors comply with IEC 60384-14 | | P |
| | Resistors comply with test (a) in 14.1 of IEC 60065 | | N/A |

| | | | |
|---|---|---|---|
| **9 (8)** | **TERMINALS** | | **N/A** |
| | Screw terminals according section 14 of IEC 60598-1: | | **N/A** |
| | Separately approved; component list | (see Annex 1) | N/A |
| | Part of the controlgear | (see Annex 2) | N/A |



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| IEC 61347-2-13 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| | Screwless terminals according section 15 of IEC 60598-1: | | **N/A** |
| | Separately approved; component list | (see Annex 1) | N/A |
| | Part of the controlgear | (see Annex 3) | N/A |

| | | | |
|---|---|---|---|
| **10 (9)** | **PROVISION FOR PROTECTIVE EARTHING** | | **N/A** |
| **- (9.1)** | **Provisions for protective earthing** | | **N/A** |
| | Terminal complying with clause 8 | | N/A |
| | Locked against loosening and not possible to loosen by hand | | N/A |
| | Not possible to loosen clamping means unintentionally on screwless terminals | | N/A |
| | All parts of material minimizing the danger of electrolytic corrosion | | N/A |
| | Made of brass or equivalent material | | N/A |
| | Contact surface bare metal | | N/A |
| | Test according 7.2.3 of IEC 60598-1 | | N/A |
| **- (9.2)** | **Provision for functional earthing** | | **N/A** |
| | Comply with clause 8 and 9.1 | | N/A |
| | Functional earth insulated from live parts by double or reinforced insulation | | N/A |
| **- (9.3)** | **Lamp controlgear with conductors for protective earthing by tracks on printed circuit board** | | **N/A** |
| | Test with a current of 25 A between earthing terminal or earthing contact and each of the accessible metal parts;<br>measured resistance (Ω) at ≥ 10 A according 7.2.3 of IEC 60598-1: < 0,5 Ω .....: | | N/A |
| **- (9.4)** | **Earthing of built-in lamp controlgear** | | **N/A** |
| | Earth by means of fixing to earthed metal of luminaire in compliance of 7.2 of IEC 60598-1 | | N/A |
| | Earthing terminal only for earthing the built-in controlgear | | N/A |
| **- (9.5)** | **Earthing via independent controlgear** | | **N/A** |
| - (9.5.1) | Earth connection to other equipment | | N/A |
| | Looping or through connection, conductor min. 1,5 mm² and of copper or equivalent | | N/A |



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| IEC 61347-2-13 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Protective earthing wires in line with 5.3.1.1 and clause 7 of IEC 60598-1 | | N/A |
| - (9.5.2) | Earthing of the lamp compartments powered via the independent lamp controlgear | | N/A |
| | Test with a current of 25 A between input and output earth terminals; measured resistance (Ω) between earthing terminal or earthing contact and each of the accessible metal parts at ≥ 10 A according 7.2.3 of IEC 60598-1: < 0,5 Ω .....: | | N/A |
| | Output earthing terminal marked as in 7.1 t) of IEC 61347-1 | | N/A |
| **11 (11)** | **MOISTURE RESISTANCE AND INSULATION** | | **P** |
| - (11) | After storage 48 h at 91-95% relative humidity and 20-30 °C measuring of insulation resistance: | | P |
| | For basic insulation ≥ 2 MΩ .....: | >500MΩ | P |
| | For double or reinforced insulation ≥ 4 MΩ .....: | >500MΩ | P |
| | Between primary and secondary circuits in controlgear providing SELV, values in Annex L in IEC 61347-1 | | P |
| **12 (12)** | **ELECTRIC STRENGTH** | | **P** |
| - (12) | Immediately after clause 11 electric strength test for 1 min | | P |
| | Basic insulation for SELV, test voltage 500 V | | N/A |
| | Working voltage ≤ 50 V, test voltage 500 V | | N/A |
| | Working voltage > 50 V ≤ 1000 V, test voltage (V): | | P |
| | Basic insulation, 2U + 1000 V | 1480V | P |
| | Supplementary insulation, 2U + 1000 V | | N/A |
| | Double or reinforced insulation, 4U + 2000 V | 2960V | P |
| | No flashover or breakdown | | P |
| | Solid or thin sheet insulation for double or reinforced insulation fulfil the requirements in Annex N in IEC 61347-1 | | P |
| **14 (14)** | **FAULT CONDITIONS** | | **P** |
| - (14.1) | When operated under fault conditions the controlgear: | | P |



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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - does not emit flames or molten material | | P |
| | - does not produce flammable gases | | P |
| | - protection against accidental contact not impaired | | P |
| | Thermally protected controlgear does not exceed the marked temperature value | | N/A |
| | Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected | (see appended table) | P |
| - (14.2) | Short-circuit of creepage distances and clearances if less than specified in clause 16 in Part 1 (after any reduction in 14.2 - 14.5) | (see appended table) | P |
| - (14.3) | Short-circuit or interruption of semiconductor devices | (see appended table) | P |
| - (14.4) | Short-circuit across insulation consisting of lacquer, enamel or textile | (see appended table) | N/A |
| - (14.5) | Short-circuit across electrolytic capacitors | (see appended table) | P |
| 14 (-) | Reversed voltage polarity if d.c. supplied control gear | (see appended table) | N/A |
| - (14.6) | After the tests has been carried out on three samples: | | P |
| | The insulation resistance ≥ 1 MΩ .....: | >500 MΩ | P |
| | No flammable gases | | P |
| | No accessible parts have become live | | P |
| | During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite | | P |
| - (14.7) | Relevant fault condition tests with high-power a.c. supply | | — |
| 14 (-) | Temperature declared thermally protected lamp controlgear fulfil requirements in Annex C | | N/A |
| **15 (-)** | **TRANSFORMER HEATING** | | **P** |
| **15.1** | **General** | | **P** |
| | Transformer comply with clause L.6 and L.7 of IEC 61347-1 | | P |
| | Output voltage of SELV controlgear not exceed limits in 10.4 of IEC 61347-1 during the test of 15.1 and 15.2 | | P |



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| IEC 61347-2-13 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| **15.2 (-)** | **Normal operation** | | **P** |
| | Comply with clause L.6 of IEC 61347-1 | | P |
| **15.3 (-)** | **Abnormal operation** | | **P** |
| | Comply with clause L.7 of IEC 61347-1 | | P |
| | Double LED modules or equivalent load connected in parallel to the output terminals of constant voltage type | | P |
| | Double LED modules or equivalent load connected in parallel to the output terminals of constant current type | | N/A |
| 15 (-) | During and at the end of the tests no defect impairing safety, nor any smoke or flammable gases produced | | P |

| | | | |
|---|---|---|---|
| **16 (15)** | **CONSTRUCTION** | | **P** |
| **- (15.1)** | **Wood, cotton, silk, paper and similar fibrous material** | | **P** |
| | Wood, cotton, silk, paper and similar fibrous material not used as insulation | | P |
| **- (15.2)** | **Printed circuits** | | **P** |
| | Printed circuits used as internal connections complies with clause 14 | | P |
| **- (15.3)** | **Plugs and socket-outlets used in SELV or ELV circuits** | | **P** |
| | No dangerous compatibility between output socket-outlet and a plug for socket-outlets for input circuit in relation to installation rules, voltages and frequencies | | P |
| | Plugs and socket-outlets for SELV comply with IEC 60906-3 and IEC 60884-2-4 | | P |
| | Plugs and socket-outlets for SELV ≤ 3 A, ≤ 25 V r.m.s. or ≤ 60 V d.c. and ≤ 72 W comply with IEC 60906-3 and IEC 60884-2-4 or: | | P |
| | - plugs not able to enter socket-outlets of other standardised system | | P |
| | - socket-outlets not admit plugs of other standardised system | | P |
| | - socket-outlets without protective earth | | P |
| **- (15.4)** | **Insulation between circuits and accessible parts** | | **P** |
| - (15.4.2) | SELV circuits | | P |
| | Source used to supply SELV circuits: | | P |



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| IEC 61347-2-13 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - safety isolating transformer in accordance with relevant part 2 of IEC 61558 | | P |
| | - controlgear providing SELV in accordance with relevant part 2 of IEC 61347 | | P |
| | - another source | | N/A |
| | Voltage in the circuit not higher than ELV | | P |
| | SELV circuits insulated from LV by double or reinforced insulation | | P |
| | SELV circuits insulated from non SELV circuits by double or reinforced insulation | | N/A |
| | SELV circuits insulated from FELV circuits by supplementary insulation | | N/A |
| | SELV circuits insulated from other SELV circuits by basic insulation | | N/A |
| | SELV circuits insulated from accessible conductive parts according Table 6 in 15.4.5 | | P |
| - (15.4.3) | FELV circuits | | N/A |
| | Source used to supply FELV circuits: | | N/A |
| | - separating transformer in accordance with relevant part 2 of IEC 61558 | | N/A |
| | - separating controlgear providing basic insulation between input and output circuits in accordance with relevant part 2 of IEC 61347 | | N/A |
| | - another source | | N/A |
| | - source in circuits separated by the LV supply by basic insulation | | N/A |
| | Voltage in the circuit not higher than ELV | | N/A |
| | FELV circuits insulated from LV supply by at least basic insulation | | N/A |
| | FELV circuits insulated from other FELV circuits if functional purpose | | N/A |
| | FELV circuits insulated from accessible conductive parts according Table 6 in 15.4.5 | | N/A |
| | Plugs and socket-outlets for FELV system comply with: | | N/A |
| | - plugs not able to enter socket-outlets of other voltage systems | | N/A |
| | - socket-outlets not admit plugs of other voltage systems | | N/A |



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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - socket-outlets have a protective conductor contact | | N/A |
| - (15.4.4) | Other circuits | | N/A |
| | Insulation between circuits other than SELV or FELV and accessible conductive parts in according Table 6 in 15.4.5. | | N/A |
| - (15.4.5) | Insulation between circuits and accessible conductive parts | | N/A |
| | Accessible conductive parts insulated from active parts of electric circuits by insulating according Table 6 | | N/A |
| | Requirements for Class II construction with equipotential bonding for protection against indirect contact with live parts: | | N/A |
| | - all conductive parts are connected together | | N/A |
| | - conductive parts are reliably connected together according test of IEC 60598-1 cl. 7.2.3 | | N/A |
| | - conductive parts comply with requirements of Annex A in case of insulation fault | | N/A |
| **17 (16)** | **CREEPAGE DISTANCES AND CLEARANCES** | | **P** |
| - (16) | Creepage distances and clearances according to 16.2 and 16.3 | | P |
| | Controlgears providing SELV comply with additional requirements in Annex L | | P |
| | Insulating lining of metallic enclosures | | N/A |
| | Controlgear protected against pollution comply with Annex P | (see Annex P) | N/A |
| **- (16.2)** | **Creepage distances** | | **P** |
| - (16.2.2) | Minimum creepage distances for working voltages | | P |
| | Creepage distances according to Table 7 | (see appended table) | P |
| - (16.2.3) | Creepage distances for working voltages with frequencies above 30 kHz | | N/A |
| | Creepage distances according to Table 8 | (see appended table) | N/A |
| **- (16.3)** | **Clearances** | | P |
| - (16.3.2) | Clearances for working voltages | | P |
| | Clearances distances according to Table 9 | (see appended table) | P |
| - (16.3.3) | Clearances for ignition voltages and working voltages with higher frequencies | | N/A |
| | Clearances distances for basic or supplementary insulation according to Table 10 | (see appended table) | N/A |



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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Clearances distances for reinforced insulation according to Table 11 | (see appended table) | P |

| | | | |
|---|---|---|---|
| **18 (17)** | **SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS** | | **P** |
| | Screws, current-carrying parts and connections in compliance with IEC 60598-1 (clause numbers between parentheses refer to IEC 60598-1) | | P |
| **(4.11)** | **Electrical connections** | | **P** |
| (4.11.1) | Contact pressure | | P |
| (4.11.2) | Screws: | | N/A |
| | - self-tapping screws | | N/A |
| | - thread-cutting screws | | N/A |
| (4.11.3) | Screw locking: | | N/A |
| | - spring washer | | N/A |
| | - rivets | | N/A |
| (4.11.4) | Material of current-carrying parts | | P |
| (4.11.5) | No contact to wood or mounting surface | | P |
| (4.11.6) | Electro-mechanical contact systems | | N/A |
| **(4.12)** | **Mechanical connections and glands** | | **N/A** |
| (4.12.1) | Screws not made of soft metal | | N/A |
| | Screws of insulating material | | N/A |
| | Torque test: torque (Nm); part ..... : | -- | N/A |
| | Torque test: torque (Nm); part ..... : | -- | N/A |
| | Torque test: torque (Nm); part ..... : | -- | N/A |
| (4.12.2) | Screws with diameter < 3 mm screwed into metal | | N/A |
| (4.12.4) | Locked connections: | | N/A |
| | - fixed arms; torque (Nm)..... : | -- | N/A |
| | - lampholder; torque (Nm)..... : | -- | N/A |
| | - push-button switches; torque 0,8 Nm..... : | -- | N/A |
| (4.12.5) | Screwed glands; force (Nm) ..... : | -- | N/A |

| | | | |
|---|---|---|---|
| **19 (18)** | **RESISTANCE TO HEAT, FIRE AND TRACKING** | | **P** |
| - (18.1) | Ball-pressure test ..... : | See Test Table 19 (18.1) | P |
| - (18.2) | Test of printed boards ..... : | See Test Table 19 (18.2) | N/A |



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| IEC 61347-2-13 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| - (18.3) | Glow-wire test ..... : | See Test Table 19 (18.3) | P |
| - (18.4) | Needle flame test ..... : | See Test Table 19 (18.4) | P |
| - (18.5) | Tracking test ..... : | See Test Table 19 (18.5) | N/A |
| **20 (19)** | **RESISTANCE TO CORROSION** | | N/A |
| | - test according 4.18.1 of IEC 60598-1 | | N/A |
| | - adequate varnish on the outer surface | | N/A |
| **21 (-)** | **MAXIMUM WORKING VOLTAGE ($U_{out}$) IN ANY LOAD CONDITION** | | **N/A** |
| | Not exceed declared maximum working voltage $U_{out}$ in any load condition | | N/A |

| **14** | **TABLE: tests of fault conditions** | **P** |
|---|---|---|
| Part | Simulated fault | Hazard |
| TJ-GS05V4W-0800 | | |
| O/C Output | Unit shut down immediately. Recoverable. | No |
| S/C Output | Unit shut down immediately. Recoverable. | No |
| S/C EC4 | Unit shut down immediately. Recoverable. | No |
| S/C D2 | Unit shut down immediately. Recoverable. | No |
| S/C D1 | R1 broken. Non-recoverable. | No |
| S/C D3 | Unit shut down immediately. Recoverable. | No |
| S/C U1 (VCC-GND) | Unit shut down immediately. Recoverable. | No |
| S/C EC2 | R1 broken. Non-recoverable. | No |
| S/C EC1 | Unit shut down immediately. Recoverable. | No |
| S/C EC3 | Unit shut down immediately. Recoverable. | No |
| O/C BR(+-) | Unit shut down immediately. Recoverable. | No |
| S/C BR(+-) | F1 broken. Non-recoverable. | No |
| TJ-GS05V8W-1600 | | |
| O/C Output | Unit shut down immediately. Recoverable. | No |
| S/C Output | Unit shut down immediately. Recoverable. | No |
| S/C EC4 | Unit shut down immediately. Recoverable. | No |
| S/C D2 | Unit shut down immediately. Recoverable. | No |



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| IEC 61347-2-13 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | |
|---|---|---|
| S/C D1 | Unit shut down immediately. Recoverable. | No |
| S/C D3 | Unit shut down immediately. Recoverable. | No |
| S/C U1(VCC-GND) | Unit shut down immediately. Recoverable. | No |
| S/C EC1 | F1 broken. Non-recoverable. | No |
| S/C EC2 | F1 broken. Non-recoverable. | No |
| S/C EC3 | Unit shut down immediately. Recoverable. | No |
| O/C BR(+-) | Unit shut down immediately. Recoverable. | No |
| S/C BR(+-) | F1 broken. Non-recoverable. | No |
| TJ-GS12V15W-1250 | | |
| S/C EC4 | Unit shut down immediately. Recoverable. | No |
| S/C D1 | Unit shut down immediately, input power reduced to 16W. Recoverable. | No |
| S/C D2 | Unit shut down immediately. Recoverable. | No |
| S/C D3 | Unit shut down immediately. Recoverable. | No |
| S/C U1(VCC-GND)(1-8) | Unit shut down immediately. Recoverable. | No |
| S/C EC3 | Unit shut down immediately. Recoverable. | No |
| S/C EC2 | F1 broken. Non-recoverable. | No |
| S/C BD1(1-3) | F1 broken. Non-recoverable. | No |
| Remark: S/C means short circuit; O/C means open circuit. | | |

| **17 (16)** | **TABLE: clearance and creepage distance measurements (mm)** | | | | | | **P** |
|---|---|---|---|---|---|---|---|
| **Applicable part of IEC 61347-1 Table 7 – 11*** | | | | | | | |
| **Distances** | **Insulation type **** | **Measured clearance** | **Required** | | **Measured creepage** | **Required** | |
| | | | **clearance** | ***Table** | | **creepage** | ***Table** |
| Distance 1: | B | 3.8 | 1.5 | 9 | 3.8 | 2.5 | 7 |
| Working voltage (V).....: | | | | | 240 | | — |
| Frequency if applicable (kHz) .....: | | | | | - | | — |
| PTI.....: | | | | | < 600 ☒ | ≥ 600 ☐ | — |
| Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) .....: | | | | | - | | — |
| Pulse voltage if applicable (kV) .....: | | | | | - | | — |
| Supplementary information: between L and N on PCB; between two pins of fuse. | | | | | | | |
| Distance 2: | R | 5.8 | 3.0 | 9 | 5.8 | 5.0 | 7 |



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

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Working voltage (V) ..... : | | | | | 240 | | — |
| Frequency if applicable (kHz) ..... : | | | | | - | | — |
| PTI ..... : | | | | | < 600 ☒ | ≥ 600 ☐ | — |
| Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... : | | | | | - | | — |
| Pulse voltage if applicable (kV) ..... : | | | | | - | | — |
| Supplementary information: between primary circuit and secondary circuit. | | | | | | | |
| Distance 3: | R | >6.5 | 3.0 | 9 | >6.5 | 5.0 | 7 |
| Working voltage (V) ..... : | | | | | 240 | | — |
| Frequency if applicable (kHz) ..... : | | | | | - | | — |
| PTI ..... : | | | | | < 600 ☒ | ≥ 600 ☐ | — |
| Peak value of the working voltage $\hat{U}_{out}$ if applicable (kV) ..... : | | | | | - | | — |
| Pulse voltage if applicable (kV) ..... : | | | | | - | | — |
| Supplementary information: between live parts and accessible plastic enclosure. | | | | | | | |

** Insulation type: B – Basic; S – Supplementary; R – Reinforced

| **19 (18.1)** | **TABLE: Ball Pressure Test** | | | **P** |
|---|---|---|---|---|
| **Allowed impression diameter (mm)** ..... : | | 2.0mm | | — |
| Object/ Part No./ Material | Manufacturer/ trademark | Test temperature (°C) | Impression diameter (mm) | |
| Enclosure | See CDF | 125 | 0.3 | |
| Bobbin of transformer | See CDF | 125 | 0.6 | |
| PCB | See CDF | 125 | 0.2 | |
| Supplementary information: N/A | | | | |

| **19 (18.2)** | **TABLE: Test of printed boards** | | | | **N/A** |
|---|---|---|---|---|---|
| Object/ Part No./ Material | Manufacturer/ trademark | Duration of application of test flame (s) | Ignition of specified layer Yes/No | Duration of burning (s) | Verdict |
| | | | | | |
| Supplementary information: N/A | | | | | |

| **19 (18.3)** | **TABLE: Glow-wire test** | **P** |
|---|---|---|
| **Glow wire temperature..... :** | 650°C | — |



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| IEC 61347-2-13 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| Object/ Part No./ Material | Manufacturer/ trademark | Ignition of specified layer Yes/No | Duration of burning (s) | Verdict |
|---|---|---|---|---|
| Enclosure | See CDF | No | 0 | P |
| Supplementary information: N/A | | | | |

| 19 (18.4) | TABLE: Needle-flame test | | | | P |
|---|---|---|---|---|---|
| Object/ Part No./ Material | Manufacturer/ trademark | Duration of application of test flame (s) | Ignition of specified layer Yes/No | Duration of burning (s) | Verdict |
| Enclosure | See CDF | 10 | No | 0 | P |
| Bobbin of transformer | See CDF | 10 | No | 0 | P |
| PCB | See CDF | 10 | No | 0 | P |
| Supplementary information: N/A | | | | | |

| 19 (18.5) | TABLE: Proof tracking test | | | | N/A |
|---|---|---|---|---|---|
| **Test voltage PTI .....:** | | | | | — |
| Object/ Part No./ Material | Manufacturer/ trademark | Withstand 50 drops without failure on three places or on three specimens | | | Verdict |
| | | | | | |
| | | | | | |
| | | | | | |
| Supplementary information: | | | | | |

| (A) | ANNEX A - TEST TO ESTABLISH WHETHER A CONDUCTIVE PART IS A LIVE PART WHICH MAY CAUSE AN ELECTRIC SHOCK | | P |
|---|---|---|---|
| (A.1) | Comply with A.2 or A.3 | | P |
| (A.2) | Voltage ≤ 35 V peak or ≤ 60 V d.c .....: | Max. 25.2Vdc | P |
| (A.3) | If voltage measured according Clause A.2 exceeds the limit value;<br>touch current does not exceed 0,7 mA (peak) or 2 mA d.c. .....: | | N/A |
| | Comply with Annex G.2 of IEC 60598-1 | | N/A |



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

| | | | |
|---|---|---|---|
| **(C)** | **ANNEX C – PARTICULAR REQUIREMENTS FOR ELECTRONIC LAMP CONTROLGEAR WITH MEANS OF PROTECTION AGAINST OVERHEATING** | | N/A |
| **(C3)** | **GENERAL REQUIREMENTS** | | N/A |
| (C3.1) | Thermal protection means integral with the convertor, protected against mechanical damage | | N/A |
| | Renewable only by means of a tool | | N/A |
| | If function depending on polarity, for cord-connected equipment protection means in both leads | | N/A |
| | Thermal links comply with IEC 60691 | | N/A |
| | Electrical controls comply with IEC 60730-2-3 | | N/A |
| (C3.2) | No risk of fire by breaking (clause C7) | | N/A |
| **(C5)** | **CLASSIFICATION** | | N/A |
| | a) automatic resetting type | | — |
| | b) manual resetting type | | — |
| | c) non-renewable, non-resetting type | | — |
| | d) renewable, non-resetting type | | — |
| | e) other type of thermal protection; description ...: | | — |
| **(C6)** | **MARKING** | | N/A |
| (C6.1) | Symbol for temperature declared thermally protected ballasts | | N/A |
| (C6.2) | Declaration of the type of protection provided | | N/A |
| **(C7)** | **LIMITATION OF HEATING** | | N/A |
| **(C7.1)** | **Preselection test:** | | N/A |
| | Test sample placed for at least 12 h in an oven having temperature ($t_c$ - 5) K | | N/A |
| | No operation of the protection device | | N/A |
| **(C7.2)** | **Functioning of protection means:** | | N/A |
| | Normal operation of the sample in a test enclosure according to Annex D at an ambient temperature such that ($t_c$ +0; -5) °C is obtained | | N/A |
| | No operation of the protection device | | N/A |
| | Introducing of the most onerous test condition determined during test of clause 14.2 to 14.5 | | N/A |



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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Output of windings connected to the mains supply short-circuited, and other part of the controlgear operated under normal conditions | | N/A |
| | Increasing of the current through the windings continuously until operation of the protection means | | N/A |
| | Continuous measuring of the highest surface temperature | | N/A |
| | Ballasts according to C5 a) or C5 e) operated until stable conditions are achieved | | N/A |
| | Automatic-resetting thermal protectors working 3 times | | N/A |
| | Ballasts according to C5 b) working 6 times | | N/A |
| | Ballasts according to C5 c) and C5) d) working once | | N/A |
| | Highest temperature does not exceed the marked value | | N/A |
| | Any overshoot of 10% over the marked value within 15 min | | N/A |
| | After 15 min value not exceed marked value | | N/A |
| **(D)** | **ANNEX D – REQUIREMENTS FOR CARRY OUT THE HEATING TESTS OF THERMALLY PROTECTED LAMP CONTROLGEAR** | | N/A |
| | Tests in C7 performed in accordance with Annex D, if applicable | | N/A |
| **(F)** | **ANNEX F – DRAUGHT-PROOF ENCOSURE** | | P |
| | Draught-proof enclosure in accordance with the description | | P |
| | Dimensions of the enclosure | | P |
| | Other design; description | | N/A |
| **(H)** | **ANNEX H - TESTS** | | P |
| | All tests performed in accordance with the advice given in Annex H, if applicable | | P |



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

| | | | |
|---|---|---|---|
| **I (L)** | **ANNEX I IN THIS PART 2 – PARTICULAR ADDITIONAL REQUIREMENTS FOR SELV D.C. OR A.C. SUPPLIED ELECTRONIC CONTROLGEARS FOR LED MODULES** | | P |
| **(L.3)** | **Classification** | | **P** |
| | Class I | Yes ☐ No ☒ | — |
| | Class II | Yes ☒ No ☐ | — |
| | Class III | Yes ☐ No ☒ | — |
| | non-inherently short circuit proof controlgear | Yes ☒ No ☐ | — |
| | inherently short circuit proof controlgear | Yes ☐ No ☒ | — |
| | fail safe controlgear | Yes ☐ No ☒ | — |
| | non-short-circuit proof controlgear | Yes ☐ No ☒ | — |
| **(L.4)** | **Marking** | | **P** |
| | Adequate symbols are used | | P |
| **(L.5)** | **Protection against electric shock** | | **P** |
| | Comply with clause 9.2 of IEC 61558-1 | | P |
| **(L.6)** | **Heating** | | **P** |
| | No excessive temperatures in normal use | | P |
| | Value if capacitor $t_c$ marked .....: | See CDF | — |
| | Winding insulation classified as Class .....: | B | — |
| | Comply with tests of clause 14 of IEC 61558-1 with adjustments | | P |
| **(L.7)** | **Short-circuit and overload protection** | | **P** |
| | Comply with tests of clause 15 of IEC 61558-1 with adjustments | | P |
| **(L.8)** | **Insulation resistance and electric strength** | | **P** |
| (L.8.1) | Conditioned 48 h between 91 % and 95 % | | P |
| (L.8.2) | Insulation resistance | | P |
| | Between input- and output circuits not less than 5 MΩ .....: | >500 MΩ | P |
| | Between metal parts of class II convertors which are separated from live parts by basic insulation only and the body not less than 5 MΩ .....: | | N/A |
| | Between metal foil in contact with the inner and outer surfaces of enclosures of insulating material not less than 2 MΩ .....: | >500 MΩ | P |



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

| | | | |
|---|---|---|---|
| (L.8.3) | Electric strength | | P |
| | 1) Between live parts of input circuits and live parts of output circuits .....: | 3000V | P |
| | 2) Over basic or supplementary insulation between: | | P |
| | a) live parts having different polarity .....: | 1500V | P |
| | b) live parts and body if intended to be connected to protective earth .....: | | N/A |
| | c) accessible metal parts and a metal rod of the same diameter as the flexible cable or cord .....: | | N/A |
| | d) live parts and an intermediate metal part .....: | | N/A |
| | e) intermediate metal parts and the body .....: | | N/A |
| | f) each input circuit and all other input circuits ....: | | N/A |
| | 3) Over reinforced insulation between the body and live parts .....: | 3000V | P |
| **(L.9)** | **Construction** | | **P** |
| (L.9.1) | Transformer comply with 19.12 of IEC 61558-1 and 19 of IEC 61558-2-6 | | P |
| | HF transformer comply with 19 of IEC 61558-2-16 | | P |
| **(L.10)** | **Components** | | **P** |
| | Protective devices comply with 20.6 – 20.11 of IEC 61558-1 | | P |
| **(L.11)** | **Creepage distances, clearances and distances through insulation** | | **P** |
| | Creepage distances and clearances not less than in Clause 16 | | P |
| | Distance through insulation according Table L.5 in IEC 61347-1 | | P |
| | 1) Basic distance through insulation | | N/A |
| | Required distance (mm) .....: | | — |
| | Measured (mm) .....: | | N/A |
| | Supplementary information | | — |
| | 2) Supplementary distance through insulation | | N/A |
| | Required distance (mm) .....: | | — |
| | Measured (mm) .....: | | N/A |
| | Supplementary information | | — |
| | 3) Reinforced distance through insulation | | P |
| | Required distance (mm) .....: | Thickness of enclosure:0.9mm | — |



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| IEC 61347-2-13 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Measured (mm) .....: | Thickness of enclosure: 1.4mm | P |
| | Supplementary information | | — |
| **J (-)** | **ANNEX J IN THIS PART 2 – PARTICULAR ADDITIONAL SAFETY REQUIREMENTS FOR A.C., A.C./D.C. OR D.C. SUPPLIED ELECTRONIC CONTROLGEAR FOR EMERGENCY LIGHTING** | | N/A |
| **J.1** | **General** | | N/A |
| | Intended for centralized emergency power supply | Yes ☐ No ☐ | — |
| **J.2** | **Marking** | | N/A |
| J.2.1 | Mandatory markings | | N/A |
| | a) symbol EL | | N/A |
| | b) rated emergency supply voltage (V) | | N/A |
| J.2.2 | Information to be provided if applicable | | N/A |
| | a) Limits of ambient temperature | | N/A |
| | b) Emergency output factor ($EOF_X$) | | N/A |
| | c) Information if intended for use in luminaires for high-risk task area lighting | | N/A |
| J.3 | General notes on tests | | N/A |
| | Length of output cable in tests .....: | | N/A |
| | Load instead of LED lamps/modules.....: | | N/A |
| J.4 | Starting conditions | | N/A |
| | Start rated load in emergency mode without adversely affecting the performance | | N/A |
| J.5 | Operating condition | | N/A |
| | Comply with the requirements of 7.2 of IEC 62384 at 90% and 110% of rated emergency supply voltage | | N/A |
| J.6 | Emergency supply current | | N/A |
| | Emergency supply current not differ more than ±15 % | | N/A |
| | Supply of low impedance and low inductance | | N/A |
| J.7 | EMC immunity | | N/A |
| | Comply with the requirements of IEC 61547 | | N/A |
| J.8 | Pulse voltage from central battery systems | | N/A |



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

| | | | |
|---|---|---|---|
| | Withstand pulses according Table J.1 | | N/A |
| J.9 | Tests for abnormal conditions | | N/A |
| | Comply with the requirements of 12 of IEC 62384 | | N/A |
| J.10 | Comply with the requirements of 13 of IEC 62384 | | N/A |
| J.11 | Functional safety ($EOF_x$) | | N/A |
| | Declared emergency output factor ($EOF_x$) achieved during emergency operation | | N/A |

| | | | |
|---|---|---|---|
| **(N)** | **ANNEX N: REQUIREMENTS FOR INSULATION MATERIALS USED FOR DOUBLE OR REINFORCED INSULATION** | | P |
| **(N.4)** | **General requirements** | | **P** |
| (N.4.1) | Material comply with IEC 60085 and IEC 60216 series | | P |
| **(N.4.2)** | **Solid insulation** | | **P** |
| | Electric strength test at least 5 kV or 1,35 x test voltage in Table N.1 | | P |
| | If not classified according IEC 60085 and IEC 60216 series: Electric strength test increased 10 % of 5,5 kV or 1,5 x test voltage in Table N.1 | | N/A |
| **(N.4.3)** | **Thin sheet insulation** | | P |
| (N.4.3.1) | Thickness and composition of thin sheet insulation | | P |
| | - Inside the ballast and not subjected to handling or abrasion during the production and during maintenance | | N/A |
| | - Non-separated layers: Min. 3 layers and fulfil mandrel test of 150N | | N/A |
| | - Separated layers: Min. 2 layers and each layer fulfil mandrel test of 50N | | N/A |
| | - Separated layers (alternative): Min. 3 layers and 2/3 of the layers fulfil mandrel test of 100N | | P |
| (N.4.3.2) | Mandrel test (electric strength test during mechanical stress) | | P |
| | Electric strength test after mandrel test: | | P |
| | - Non-separated layers: min. 5 kV or 1,35 x test voltage in Table N.1 | | N/A |
| | - 2/3 of min. 3 separated layers: min. 5 kV or 1,25 x test voltage in Table N.1 | | N/A |
| | - one of 2 separated layers: min. 5 kV or 1,25 x test voltage in Table N.1 | | P |



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| IEC 61347-2-13 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | No flashover or breakdown occurred | | P |
| **(O)** | **ANNEX O: ADDITIONAL REQUIREMENTS FOR BUILT-IN ELECTRONIC CONTROLGEAR WITH DOUBLE OR REINFORCED INSULATION** | | N/A |
| **(O.6)** | **Marking** | | N/A |
| | Marking according clause 7 (7) | See clause 7 | N/A |
| | Special symbol | | N/A |
| | Meaning of the special symbol explained in catalogue | | N/A |
| **(O.7)** | **Protection against accidental contact with live parts** | | N/A |
| | Requirements of clause 8 (10) | See clause 8 | N/A |
| | Test finger not possible to make contact with basic insulated metal parts | | N/A |
| **(O.8)** | **Terminals** | | N/A |
| | Clause 9 (8) | See clause 9 | N/A |
| **(O.9)** | **Provision for earthing** | | N/A |
| | Functional earthing terminals comply with clause 9 of part 1 | | N/A |
| | No protective earthing terminal | | N/A |
| **(O.10)** | **Moisture resistance and insulation** | | N/A |
| | Clause 11 (11) | See clause 11 | N/A |
| **(O.11)** | **Electric strength** | | N/A |
| | Clause 12 (12) | See clause 12 | N/A |
| **(O.13)** | **Fault conditions** | | N/A |
| | Clause 14 (14) | See clause 14 | N/A |
| | End of test, between live part and accessible metal parts or external parts of insulating material in contact with the supporting surface comply with dielectric strength test reduced to 35 % of values according Table 1 in part 1 | | N/A |
| | Insulation resistance according to O.10 between live part and accessible metal parts or external parts of insulating material in contact with the supporting surface not less than 4 MΩ | | N/A |
| **(O.14)** | **Construction** | | N/A |
| | Clause 17 (15) | See clause 17 | N/A |



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

| | | | |
|---|---|---|---|
| | Accessible metal parts insulated from live parts by double or reinforced insulation | | N/A |
| | Live part insulated from supporting surface in contact with external faces by double or reinforced insulation | | N/A |
| **(O.15)** | **Creepage distances and clearances** | | N/A |
| | Clause 18 (16) | See clause 18 | N/A |
| | Comply with corresponding values for luminaries in IEC 60598-1 | | N/A |
| **(O.16)** | **Screws, current-carrying parts and connections** | | N/A |
| | Clause 19 (17) | See clause 19 | N/A |
| **(O.17)** | **Resistance to heat and fire** | | N/A |
| | Clause 20 (18) | See clause 20 | N/A |
| **(O.18)** | **Resistance to corrosion** | | N/A |
| | Clause 21 (19) | See clause 21 | N/A |

| | | | |
|---|---|---|---|
| **(P)** | **Creepage distances and clearances and distance through isolation (DTI) for lamp controlgear which are protected against pollution by the use of coating or potting** | | N/A |
| **(P.1)** | **General** | | N/A |
| | P.2 applies if creepage distances less than the minimum in Table 7 and 8 | | N/A |
| | P.3 applies if clearance less than the minimum in Table 9, 10 and 11 | | N/A |
| **(P.2)** | **Creepage distances** | | N/A |
| (P.2.2) | Minimum creepage distances for working voltages and rated voltages with frequencies up to 30 kHz (Table P.1) | | N/A |
| | Basic or supplementary insulation: | | N/A |
| | Required creepage.....: | | — |
| | Measured.....: | | N/A |
| | Supplementary information | | — |
| | Reinforced insulation: | | N/A |
| | Required creepage.....: | | — |
| | Measured.....: | | N/A |
| | Supplementary information | | — |



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

| | | | |
|---|---|---|---|
| (P.2.3) | Creepage distances for working voltages with frequencies above 30 kHz (Table P.2) | | N/A |
| | Voltage $\hat{U}_{out}$ kV .....: | | — |
| | Frequency .....: | | — |
| | Required distance .....: | | — |
| | Measured .....: | | N/A |
| | Supplementary information | | — |
| (P.2.4) | Compliance with the required creepage distances | | N/A |
| (P.2.4.1) | Compliance in accordance with 16.3.3 and test according P.2.4.2 | | N/A |
| (P.2.4.3) | Electrical tests after conditioning | | N/A |
| (P.2.4.3.1) | Insulation resistance and electric strength according Clause 11 and 12 | | N/A |
| **(P.3)** | **Distance through isolation** | | N/A |
| (P.3.4) | Electrical tests after conditioning | | N/A |
| (P.3.4.1) | Insulation resistance and electric strength according Clause 11 and 12 | | N/A |
| (P.3.4.2) | Impulse voltage dielectrical test | | N/A |
| | Basic or supplementary insulation: | | N/A |
| | Working/rated voltage .....: | | — |
| | Impulse voltage .....: | | N/A |
| | Supplementary information | | — |
| | Reinforced insulation: | | N/A |
| | Working/rated voltage .....: | | — |
| | Impulse voltage .....: | | N/A |
| | Supplementary information | | — |

| | | |
|---|---|---|
| **ANNEX 1** | **TABLE: Critical components information (See CDF)** | **P** |

| | | | |
|---|---|---|---|
| **ANNEX 2** | **Screw terminals (part of the luminaire)** | | **N/A** |
| **(14)** | **SCREW TERMINALS** | | **N/A** |
| (14.2) | Type of terminal..... : | | — |
| | Rated current (A)..... : | | — |



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

| | | | |
|---|---|---|---|
| (14.3.2.1) | One or more conductors | | N/A |
| (14.3.2.2) | Special preparation | | N/A |
| (14.3.2.3) | Terminal size | | N/A |
| | Cross-sectional area (mm²)..... : | | — |
| (14.3.3) | Conductor space (mm) ..... : | | N/A |
| (14.4) | Mechanical tests | | N/A |
| (14.4.1) | Minimum distance | | N/A |
| (14.4.2) | Cannot slip out | | N/A |
| (14.4.3) | Special preparation | | N/A |
| (14.4.4) | Nominal diameter of thread (metric ISO thread) ..... : | M | N/A |
| | External wiring | | N/A |
| | No soft metal | | N/A |
| (14.4.5) | Corrosion | | N/A |
| (14.4.6) | Nominal diameter of thread (mm)..... : | | N/A |
| | Torque (Nm)..... : | | N/A |
| (14.4.7) | Between metal surfaces | | N/A |
| | Lug terminal | | N/A |
| | Mantle terminal | | N/A |
| | Pull test; pull (N) ..... : | | N/A |
| (14.4.8) | Without undue damage | | N/A |

| **ANNEX 3** | **Screwless terminals (part of the luminaire)** | | **N/A** |
|---|---|---|---|
| **(15)** | **SCREWLESS TERMINALS** | | **N/A** |
| (15.2) | Type of terminal..... : | | — |
| | Rated current (A) ..... : | | — |
| (15.3.1) | Material | | N/A |
| (15.3.2) | Clamping | | N/A |
| (15.3.3) | Stop | | N/A |
| (15.3.4) | Unprepared conductors | | N/A |
| (15.3.5) | Pressure on insulating material | | N/A |
| (15.3.6) | Clear connection method | | N/A |
| (15.3.7) | Clamping independently | | N/A |
| (15.3.8) | Fixed in position | | N/A |



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

| | | | |
|---|---|---|---|
| (15.3.10) | Conductor size | | N/A |
| | Type of conductor | | N/A |
| (15.5) | Terminals and connections for internal wiring | | N/A |
| (15.5.1) | Mechanical tests | | N/A |
| (15.5.1.1.1) | Pull test spring-type terminals (4 N, 4 samples)..... : | | N/A |
| (15.5.1.1.2) | Pull test pin or tab terminals (4 N, 4 samples)..... : | | N/A |
| | Insertion force not exceeding 50 N | | N/A |
| (15.5.1.2) | Permanent connections: pull-off test (20 N) | | N/A |
| (15.5.2) | Electrical tests | | N/A |
| | Voltage drop (mV) after 1 h (4 samples)..... : | | N/A |
| | Voltage drop of two inseparable joints | | N/A |
| | Number of cycles: | | — |
| | Voltage drop (mV) after 10th alt. 25th cycle (4 samples)..... : | | N/A |
| | Voltage drop (mV) after 50th alt. 100th cycle (4 samples)..... : | | N/A |
| | After ageing, voltage drop (mV) after 10th alt. 25th cycle (4 samples)..... : | | N/A |
| | After ageing, voltage drop (mV) after 50th alt. 100th cycle (4 samples)..... : | | N/A |
| (15.6) | Terminals and connections for external wiring | | N/A |
| (15.6.1) | Conductors | | N/A |
| | Terminal size and rating | | N/A |
| 15.6.2 | Mechanical tests | | N/A |
| (15.6.2.1) | Pull test spring-type terminals or welded connections (4 samples); pull (N) ..... : | | N/A |
| (15.6.2.2) | Pull test pin or tab terminals (4 samples); pull (N) ..... : | | N/A |
| (15.6.3) | Electrical tests | | N/A |
| | Tests according 15.6.3.1 + 15.6.3.2 in IEC 60598-1 | | N/A |

| **(15.6.3.1) (15.6.3.2)** | **TABLE: Contact resistance test / Heating tests** | | | | | | | | | N/A |
|---|---|---|---|---|---|---|---|---|---|---|
| | Voltage drop (mV) after 1 h | | | | | | | | | — |
| terminal | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| voltage drop (mV) | | | | | | | | | | |



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

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Voltage drop of two inseparable joints | | | | | | | | | N/A |
| | Voltage drop after 10th alt. 25th cycle | | | | | | | | | N/A |
| | Max. allowed voltage drop (mV)..... : | | | | | | | | | — |
| terminal | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| voltage drop (mV) | | | | | | | | | | |
| | Voltage drop after 50th alt. 100th cycle | | | | | | | | | N/A |
| | Max. allowed voltage drop (mV)..... : | | | | | | | | | — |
| terminal | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| voltage drop (mV) | | | | | | | | | | |
| | Continued ageing: voltage drop after 10th alt. 25th cycle | | | | | | | | | N/A |
| | Max. allowed voltage drop (mV)..... : | | | | | | | | | — |
| terminal | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| voltage drop (mV) | | | | | | | | | | |
| | Continued ageing: voltage drop after 50th alt. 100th cycle | | | | | | | | | N/A |
| | Max. allowed voltage drop (mV)..... : | | | | | | | | | — |
| terminal | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| voltage drop (mV) | | | | | | | | | | |
| | | | | | | | | | | |

| 15.3 | TABLE: transformer heating--abnormal condition | | P |
|---|---|---|---|
| | Type reference ..... : | TJ-GS05V4W-0800<br>TJ-GS36V4W-0111<br>TJ-GS05V8W-1600<br>TJ-GS36V8W-0222<br>TJ-GS12V15W-1250 | — |
| | Lamp used ..... : | -- | — |
| | Mounting position ..... : | As in normal use | — |
| | Test voltage ..... : | 1,1x240=264V | — |

| temperature (°C) of part | Test (°C)<br>(Max. value recorded) | Limit<br>(°C) |
|---|---|---|
| -- | -- | -- |



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

Remark:

1. Connect double the LED modules in parallel to the output terminals for 1h.
2. At the end of the tests, the controlgear show no defect impairing safety, nor shall any smoke or flammable gasses be produced.
3. Output shutdown immediately, the temperature rise of components are lower than temperature rise of components at normal heating test, so no temperature rise data are recorded.

| L.6 | TABLE: Heating - normal operation | | P |
|---|---|---|---|
| | Type reference ..... : | TJ-GS05V4W-0800 | — |
| | ta (°C) ..... : | 45ºC | — |
| | Lamp used ..... : | Electronic load | — |
| | Mounting position ..... : | As in normal use | — |
| | Test voltage(V) ..... : | 254.4V | — |

| Model | Primary Winding (°C) | Limit (°C) | Secondary Winding (°C) | Limit (°C) |
|---|---|---|---|---|
| TJ-GS05V4W-0800 | 87.9 | 120 | 87.9 | 120 |
| **Remark: Chose the maximum value to record.** | | | | |

| L.6 | TABLE: Heating - normal operation | | P |
|---|---|---|---|
| | Type reference ..... : | TJ-GS36V4W-0111 | — |
| | ta (°C) ..... : | 45ºC | — |
| | Lamp used ..... : | Electronic load | — |
| | Mounting position ..... : | As in normal use | — |
| | Test voltage(V) ..... : | 254.4V | — |

| Model | Primary Winding (°C) | Limit (°C) | Secondary Winding (°C) | Limit (°C) |
|---|---|---|---|---|
| TJ-GS36V4W-0111 | 90.4 | 120 | 90.4 | 120 |
| **Remark: Chose the maximum value to record.** | | | | |

| L.6 | TABLE: Heating - normal operation | | P |
|---|---|---|---|
| | Type reference ..... : | TJ-GS05V8W-1600 | — |
| | ta (°C) ..... : | 45ºC | — |
| | Lamp used ..... : | Electronic load | — |
| | Mounting position ..... : | As in normal use | — |
| | Test voltage(V) ..... : | 254.4V | — |



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

| Model | Primary Winding (°C) | Limit (°C) | Secondary Winding (°C) | Limit (°C) |
|---|---|---|---|---|
| TJ-GS05V8W-1600 | 98.0 | 120 | 98.0 | 120 |
| **Remark: Chose the maximum value to record.** | | | | |

| **L.6** | **TABLE: Heating - normal operation** | | | P |
|---|---|---|---|---|
| | Type reference ..... : | | TJ-GS36V8W-0222 | — |
| | ta (°C) ..... : | | 45ºC | — |
| | Lamp used ..... : | | Electronic load | — |
| | Mounting position ..... : | | As in normal use | — |
| | Test voltage(V) ..... : | | 254.4V | — |
| Model | Primary Winding (°C) | Limit (°C) | Secondary Winding (°C) | Limit (°C) |
| TJ-GS36V8W-0222 | 88.1 | 120 | 88.1 | 120 |
| **Remark: Chose the maximum value to record.** | | | | |

| **L.6** | **TABLE: Heating - normal operation** | | | P |
|---|---|---|---|---|
| | Type reference ..... : | | TJ-GS12V15W-1250 | — |
| | ta (°C) ..... : | | 45ºC | — |
| | Lamp used ..... : | | Electronic load | — |
| | Mounting position ..... : | | As in normal use | — |
| | Test voltage(V) ..... : | | 254.4V | — |
| Model | Primary Winding (°C) | Limit (°C) | Secondary Winding (°C) | Limit (°C) |
| TJ-GS12V15W-1250 | 96.8 | 120 | 96.8 | 120 |
| **Remark: Chose the maximum value to record.** | | | | |

| **L.7** | **TABLE: Heating - abnormal operation (short-circuit and overload)** | | P |
|---|---|---|---|
| | Type reference ..... : | TJ-GS05V4W-0800 | — |
| | ta (°C) ..... : | 45ºC | — |
| | Lamp used ..... : | Electronic load | — |
| | Mounting position ..... : | As in normal use | — |
| | Test voltage(V) ..... : | 264V | — |



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

| temperature (°C) of part | Test (°C)<br>(Max. value recorded) | Limit<br>(°C) |
|---|---|---|
| Enclosure intended to be gripped by hand(Top surface) | 72.0 | 75 |
| Enclosure intended to be gripped by hand(Left side surface) | 72.1 | 75 |
| Enclosure intended to be gripped by hand(Right side surface) | 73.6 | 75 |
| T1 winding | 104.0 | 175 |
| Outside surface of enclosure(above the hottest point) | 72.0 | 105 |

| L.7 | TABLE: Heating - abnormal operation (short-circuit and overload) | | P |
|---|---|---|---|
| | Type reference ..... : | TJ-GS36V4W-0111 | — |
| | ta (°C) ..... : | 45°C | — |
| | Lamp used ..... : | Electronic load | — |
| | Mounting position ..... : | As in normal use | — |
| | Test voltage(V) ..... : | 264V | — |

| temperature (°C) of part | Test (°C)<br>(Max. value recorded) | Limit<br>(°C) |
|---|---|---|
| T1 winding | 104.2 | 175 |
| Outside surface of enclosure(above the hottest point) | 75.0 | 105 |

| L.7 | TABLE: Heating - abnormal operation (short-circuit and overload) | | P |
|---|---|---|---|
| | Type reference ..... : | TJ-GS05V8W-1600 | — |
| | ta (°C) ..... : | 45°C | — |
| | Lamp used ..... : | Electronic load | — |
| | Mounting position ..... : | As in normal use | — |
| | Test voltage(V) ..... : | 264V | — |

| temperature (°C) of part | Test (°C)<br>(Max. value recorded) | Limit<br>(°C) |
|---|---|---|
| Enclosure intended to be gripped by hand(Top surface) | 73.0 | 75 |
| Enclosure intended to be gripped by hand(Left side surface) | 69.1 | 75 |



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| IEC 61347-2-13 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | |
|---|---|---|
| Enclosure intended to be gripped by hand(Right side surface) | 69.4 | 75 |
| T1 winding | 108.3 | 175 |
| Outside surface of enclosure(above the hottest point) | 73.0 | 105 |

| L.7 | TABLE: Heating - abnormal operation (short-circuit and overload) | | P |
|---|---|---|---|
| | Type reference .....: | TJ-GS36V8W-0222 | — |
| | ta (°C) .....: | 45ºC | — |
| | Lamp used .....: | Electronic load | — |
| | Mounting position .....: | As in normal use | — |
| | Test voltage(V) .....: | 264V | — |

| temperature (°C) of part | Test (°C) (Max. value recorded) | Limit (°C) |
|---|---|---|
| T1 winding | 102.4 | 175 |
| Outside surface of enclosure(above the hottest point) | 75.0 | 105 |

| L.7 | TABLE: Heating - abnormal operation (short-circuit and overload) | | P |
|---|---|---|---|
| | Type reference .....: | TJ-GS12V15W-1250 | — |
| | ta (°C) .....: | 45ºC | — |
| | Lamp used .....: | Electronic load | — |
| | Mounting position .....: | As in normal use | — |
| | Test voltage(V) .....: | 264V | — |

| temperature (°C) of part | Test (°C) (Max. value recorded) | Limit (°C) |
|---|---|---|
| Enclosure intended to be gripped by hand(Top surface) | 58.3 | 75 |
| Enclosure intended to be gripped by hand(Left side surface) | 62.3 | 75 |
| Enclosure intended to be gripped by hand(Right side surface) | 62.0 | 75 |
| T1 winding | 97.8 | 175 |
| Outside surface of enclosure(above the hottest point) | 61.8 | 105 |
| Output cord | 81.5 | 85 |



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# Attachment No.1

| IEC 61347_2_13F ATTACHMENT | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| ATTCHMENT TO TEST REPORT IEC 61347-2-13<br>EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES<br>Part 2-13: Particular requirements for d.c. or a.c. supplied electronic controlgear for LED modules | |
|---|---|
| **Differences according to..... :** | EN 61347-2-13:2014+A1:2017 used in conjunction with EN 61347-1:2015 |

| | | |
|---|---|---|
| | **CENELEC COMMON MODIFICATIONS (EN)** | ¾ |
| | No Common modifications | N/A |

| | | | |
|---|---|---|---|
| **ZA** | **ANNEX ZA, SPECIAL NATIONAL CONDITIONS (EN)** | | ¾ |
| | No special National conditions | | N/A |



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## Attachment No.2

| EN 60598-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 0 | GENERAL TEST REQUIREMENTS | | ¾ |
| 0.1 | Information for luminaire design considered | Yes ☒ No ☐ | ¾ |
| 0.3 | More sections applicable.....: | Yes ☐ No ☒ | ¾ |
| 2 | CLASSIFICATION | | ¾ |
| 2.2 | Type of protection .....: | Class II | ¾ |
| 2.3 | Degree of protection (Requirement: Ordinary) .....: | IP44 | ¾ |
| 2.4 | Luminaire only suitable for non-combustible surfaces .....: | Yes ☐ No ☒ | ¾ |
| | Luminaire suitable for normally flammable surfaces.....: | Yes ☒ No ☐ | ¾ |
| | Luminaire suitable to be covered by insulating material.....: | Yes ☐ No ☒ | ¾ |
| 2.5 | Luminaire for normal use .....: | Yes ☒ No ☐ | ¾ |
| | Luminaire for rough service .....: | Yes ☐ No ☒ | ¾ |
| 3 | MARKING | | P |
| 4 | CONSTRUCTION | | P |
| 4.13 | Mechanical strength | | P |
| 4.13.1 | Impact tests: | | P |
| | - fragile parts; energy (Nm) .....: | | N/A |
| | - other parts; energy (Nm) .....: | Enclosure: 0.5Nm | P |
| | 1) live parts | | P |
| | 2) linings | | P |
| | 3) protection | | P |
| | 4) covers | | P |
| 4.13.3 | Straight test finger | 30N | P |
| 4.11.6 | Electro-mechanical contact systems | | P |
| 5 | EXTERNAL AND INTERNAL WIRING | | P |
| 7 | PROVISION FOR EARTHING | | N/A |
| 8 | PROTECTION AGAINST ELECTRIC SHOCK | | P |
| 9 | RESISTANCE TO DUST, SOLID OBJECTS AND MOISTURE | | P |
| 9.2 | Tests for ingress of dust, solid objects and moisture: | | P |
| | - classification according to IP.....: | IP44 | ¾ |



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## Attachment No.2

| EN 60598-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - mounting position during test .....: | As in normal use | ¾ |
| | - fixing screws tightened; torque (Nm) .....: | -- | ¾ |
| | - tests according to clauses.....: | | ¾ |
| | - electric strength test afterwards | | P |
| | a) no deposit in dust-proof luminaire | | N/A |
| | b) no talcum in dust-tight luminaire | | N/A |
| | c) no trace of water on current-carrying parts or SELV parts or where it could become a hazard | | P |
| | d) i) For luminaires without drain holes – no water entry | | P |
| | d) ii) For luminaires with drain holes – no hazardous water entry | | N/A |
| | e) no water in watertight luminaire | | N/A |
| | f) no contact with live parts (IP 2X) | | N/A |
| | f) no entry into enclosure (IP 3X and IP 4X) | | P |
| | f) no contact with live parts (IP3X and IP4X) | | P |
| | g) no trace of water on part of lamp requiring protection from splashing water | | P |
| | h) no damage of protective shield or glass envelope | | N/A |
| 9.3 | Humidity test 48h | 25°C; 93%R.H. | P |
| 10 | INSULATION RESISTANCE AND ELECTRIC STRENGTH | | P |
| 11 | CREEPAGE DISTANCES AND CLEARANCES | | P |
| 12 | ENDURANCE TEST AND THERMAL TEST | | P |
| 13 | RESISTANCE TO HEAT, FIRE AND TRACKING | | P |
| 14 | SCREW TERMINALS | | N/A |
| 15 | SCREWLESS TERMINALS AND ELECTRICAL CONNECTIONS | | N/A |

| | | |
|---|---|---|
| | ANNEX 2: temperature measurements, thermal tests of Section 12 | P |

| | | | |
|---|---|---|---|
| | Type reference.....: | TJ-GS05V4W-0800 | ¾ |
| | Lamp used.....: | Electronic load | ¾ |
| | Lamp control gear used.....: | -- | ¾ |



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## Attachment No.2

| EN 60598-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Mounting position of luminaire.....: | As in normal use | ¾ |
| | Supply wattage (W).....: | 5.9 | ¾ |
| | Supply current (A).....: | 0.055 | ¾ |
| | Calculated power factor.....: | -- | ¾ |
| | Table: measured temperatures corrected for ta =45°C: | | P |
| | - abnormal operating mode .....: | See table of L.7 for details | ¾ |
| | - test 1: rated voltage .....: | -- | ¾ |
| | - test 2: 1,06 times rated voltage or 1,05 times rated wattage.....: | 1.06x240V | ¾ |
| | - test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage.....: | -- | ¾ |
| | - test 4: 1,1 times rated voltage or 1,05 times rated wattage.....: | 1.1x240V<br>See table of L.7 for details | ¾ |
| | Through wiring or looping-in wiring loaded by a current of A during the test .....: | -- | ¾ |

| temperature (°C) of part | Clause 12,4 – normal | | | | Clause 12,5 – abnormal | |
|---|---|---|---|---|---|---|
| | test 1 | test 2 | test 3 | limit | test 4 | limit |
| Interface of plug | ¾ | 48.0 | ¾ | 70 | ¾ | ¾ |
| Enclosure intended to be gripped by hand(Top surface) | ¾ | 55.1 | ¾ | 75 | ¾ | ¾ |
| Enclosure intended to be gripped by hand(Left side surface) | ¾ | 57.7 | ¾ | 75 | ¾ | ¾ |
| Enclosure intended to be gripped by hand(Right side surface) | ¾ | 56.2 | ¾ | 75 | ¾ | ¾ |
| Output wire | ¾ | 73.8 | ¾ | 125 | ¾ | ¾ |
| EC2 | ¾ | 69.4 | ¾ | 105 | ¾ | ¾ |
| EC3 | ¾ | 67.9 | ¾ | 105 | ¾ | ¾ |
| T1 winding | ¾ | 87.9 | ¾ | 120 | ¾ | ¾ |
| CY1 | ¾ | 70.8 | ¾ | 125 | ¾ | ¾ |
| EC4 | ¾ | 71.4 | ¾ | 105 | ¾ | ¾ |
| PCB(close to T1 and EC2) | ¾ | 81.4 | ¾ | 130 | ¾ | ¾ |
| PCB(close to T1 and EC4) | ¾ | 77.9 | ¾ | 130 | ¾ | ¾ |



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## Attachment No.2

| EN 60598-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | | |
|---|---|---|---|---|---|---|
| Inside surface of enclosure(under the hottest point) | ¾ | 59.8 | ¾ | Ref | ¾ | ¾ |
| Outside surface of enclosure(above the hottest point) | ¾ | 54.9 | ¾ | 75 | ¾ | ¾ |
| Remark: Max. values were recorded. See table of L.7 for details to test 4. | | | | | | |

| | | | |
|---|---|---|---|
| | Type reference.....: | TJ-GS36V4W-0111 | ¾ |
| | Lamp used.....: | Electronic load | ¾ |
| | Lamp control gear used.....: | -- | ¾ |
| | Mounting position of luminaire.....: | As in normal use | ¾ |
| | Supply wattage (W).....: | 5.7 | ¾ |
| | Supply current (A).....: | 0.055 | ¾ |
| | Calculated power factor.....: | -- | ¾ |
| | Table: measured temperatures corrected for ta =45°C: | | P |
| | - abnormal operating mode .....: | See table of L.7 for details | ¾ |
| | - test 1: rated voltage .....: | -- | ¾ |
| | - test 2: 1,06 times rated voltage or 1,05 times rated wattage.....: | 1.06x240V | ¾ |
| | - test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage.....: | -- | ¾ |
| | - test 4: 1,1 times rated voltage or 1,05 times rated wattage.....: | 1.1x240V<br>See table of L.7 for details | ¾ |
| | Through wiring or looping-in wiring loaded by a current of A during the test .....: | -- | ¾ |

| temperature (°C) of part | Clause 12,4 – normal | | | | Clause 12,5 – abnormal | |
|---|---|---|---|---|---|---|
| | test 1 | test 2 | test 3 | limit | test 4 | limit |
| T1 winding | ¾ | 90.4 | ¾ | 120 | ¾ | ¾ |
| Inside surface of enclosure(under the hottest point) | ¾ | 64.1 | ¾ | Ref | ¾ | ¾ |
| Outside surface of enclosure(above the hottest point) | ¾ | 60.6 | ¾ | 75 | ¾ | ¾ |
| Remark: Max. values were recorded. See table of L.7 for details to test 4. | | | | | | |



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## Attachment No.2

| EN 60598-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| | Type reference.....: | TJ-GS05V8W-1600 | ¾ |
| | Lamp used.....: | Electronic load | ¾ |
| | Lamp control gear used.....: | -- | ¾ |
| | Mounting position of luminaire.....: | As in normal use | ¾ |
| | Supply wattage (W).....: | 8.9 | ¾ |
| | Supply current (A).....: | 0.087 | ¾ |
| | Calculated power factor.....: | -- | ¾ |
| | Table: measured temperatures corrected for ta =45°C: | | P |
| | - abnormal operating mode .....: | See table of L.7 for details | ¾ |
| | - test 1: rated voltage .....: | -- | ¾ |
| | - test 2: 1,06 times rated voltage or 1,05 times rated wattage.....: | 1.06x240V | ¾ |
| | - test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage.....: | -- | ¾ |
| | - test 4: 1,1 times rated voltage or 1,05 times rated wattage.....: | 1.1x240V<br>See table of L.7 for details | ¾ |
| | Through wiring or looping-in wiring loaded by a current of A during the test .....: | -- | ¾ |

| temperature (°C) of part | Clause 12,4 – normal | | | | Clause 12,5 – abnormal | |
|---|---|---|---|---|---|---|
| | test 1 | test 2 | test 3 | limit | test 4 | limit |
| Interface of plug | ¾ | 49.4 | ¾ | 70 | ¾ | ¾ |
| Enclosure intended to be gripped by hand(Top surface) | ¾ | 66.2 | ¾ | 75 | ¾ | ¾ |
| Enclosure intended to be gripped by hand(Left side surface) | ¾ | 60.0 | ¾ | 75 | ¾ | ¾ |
| Enclosure intended to be gripped by hand(Right side surface) | ¾ | 60.2 | ¾ | 75 | ¾ | ¾ |
| Output wire | ¾ | 86.0 | ¾ | 125 | ¾ | ¾ |
| EC2 | ¾ | 79.3 | ¾ | 105 | ¾ | ¾ |
| EC3 | ¾ | 68.6 | ¾ | 105 | ¾ | ¾ |
| T1 winding | ¾ | 98.0 | ¾ | 120 | ¾ | ¾ |
| CY1 | ¾ | 76.1 | ¾ | 125 | ¾ | ¾ |



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## Attachment No.2

| EN 60598-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | | |
|---|---|---|---|---|---|---|
| EC4 | ¾ | 89.3 | ¾ | 105 | ¾ | ¾ |
| PCB(close to T1 and EC2) | ¾ | 96.2 | ¾ | 130 | ¾ | ¾ |
| PCB(close to T1 and EC4) | ¾ | 83.2 | ¾ | 130 | ¾ | ¾ |
| Inside surface of enclosure(under the hottest point) | ¾ | 69.9 | ¾ | Ref | ¾ | ¾ |
| Outside surface of enclosure(above the hottest point) | ¾ | 64.5 | ¾ | 75 | ¾ | ¾ |
| Remark: Max. values were recorded. See table of L.7 for details to test 4. | | | | | | |

| | | | |
|---|---|---|---|
| | Type reference.....: | TJ-GS36V8W-0222 | ¾ |
| | Lamp used.....: | Electronic load | ¾ |
| | Lamp control gear used.....: | -- | ¾ |
| | Mounting position of luminaire.....: | As in normal use | ¾ |
| | Supply wattage (W).....: | 8.7 | ¾ |
| | Supply current (A).....: | 0.086 | ¾ |
| | Calculated power factor.....: | -- | ¾ |
| | Table: measured temperatures corrected for ta =45°C: | | P |
| | - abnormal operating mode .....: | See table of L.7 for details | ¾ |
| | - test 1: rated voltage .....: | -- | ¾ |
| | - test 2: 1,06 times rated voltage or 1,05 times rated wattage .....: | 1.06x240V | ¾ |
| | - test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage.....: | -- | ¾ |
| | - test 4: 1,1 times rated voltage or 1,05 times rated wattage .....: | 1.1x240V<br>See table of L.7 for details | ¾ |
| | Through wiring or looping-in wiring loaded by a current of A during the test .....: | -- | ¾ |

| temperature (°C) of part | Clause 12,4 – normal | | | | Clause 12,5 – abnormal | |
|---|---|---|---|---|---|---|
| | test 1 | test 2 | test 3 | limit | test 4 | limit |
| T1 winding | ¾ | 88.1 | ¾ | 120 | ¾ | ¾ |
| Inside surface of enclosure(under the hottest point) | ¾ | 63.3 | ¾ | Ref | ¾ | ¾ |



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## Attachment No.2

| EN 60598-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Outside surface of enclosure(above the hottest point) | ¾ | 60.2 | ¾ | 75 | ¾ | ¾ |
| Remark: Max. values were recorded. See table of L.7 for details to test 4. | | | | | | |

| | | | |
|---|---|---|---|
| | Type reference.....: | TJ-GS12V15W-1250 | ¾ |
| | Lamp used.....: | Electronic load | ¾ |
| | Lamp control gear used.....: | -- | ¾ |
| | Mounting position of luminaire.....: | As in normal use | ¾ |
| | Supply wattage (W).....: | 17.35 | ¾ |
| | Supply current (A).....: | 0.156 | ¾ |
| | Calculated power factor.....: | -- | ¾ |
| | Table: measured temperatures corrected for ta =45°C: | | P |
| | - abnormal operating mode .....: | See table of L.7 for details | ¾ |
| | - test 1: rated voltage .....: | -- | ¾ |
| | - test 2: 1,06 times rated voltage or 1,05 times rated wattage.....: | 1.06x240V | ¾ |
| | - test 3: Load on wiring to socket-outlet, 1,06 times voltage or 1,05 times wattage.....: | -- | ¾ |
| | - test 4: 1,1 times rated voltage or 1,05 times rated wattage.....: | 1.1x240V<br>See table of L.7 for details | ¾ |
| | Through wiring or looping-in wiring loaded by a current of A during the test .....: | -- | ¾ |

| temperature (°C) of part | Clause 12,4 – normal | | | | Clause 12,5 – abnormal | |
|---|---|---|---|---|---|---|
| | test 1 | test 2 | test 3 | limit | test 4 | limit |
| Interface of plug | ¾ | 51.2 | ¾ | 70 | ¾ | ¾ |
| Enclosure intended to be gripped by hand(Top surface) | ¾ | 56.2 | ¾ | 75 | ¾ | ¾ |
| Enclosure intended to be gripped by hand(Left side surface) | ¾ | 59.9 | ¾ | 75 | ¾ | ¾ |
| Enclosure intended to be gripped by hand(Right side surface) | ¾ | 62.0 | ¾ | 75 | ¾ | ¾ |
| Output wire | ¾ | 77.8 | ¾ | 125 | ¾ | ¾ |
| EC4 | ¾ | 81.0 | ¾ | 105 | ¾ | ¾ |



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## Attachment No.2

| EN 60598-1 | | | | | | |
|---|---|---|---|---|---|---|
| Clause | Requirement + Test | | | Result - Remark | | Verdict |
| EC3 | ¾ | 87.8 | ¾ | 105 | ¾ | ¾ |
| T1 winding | ¾ | 96.8 | ¾ | 120 | ¾ | ¾ |
| CY1 | ¾ | 73.6 | ¾ | 125 | ¾ | ¾ |
| EC2 | ¾ | 96.3 | ¾ | 105 | ¾ | ¾ |
| PCB(close to T1 and EC4) | ¾ | 62.5 | ¾ | 130 | ¾ | ¾ |
| Inside surface of enclosure(under the hottest point) | ¾ | 85.1 | ¾ | Ref | ¾ | ¾ |
| Outside surface of enclosure(above the hottest point) | ¾ | 61.4 | ¾ | 75 | ¾ | ¾ |
| Remark: Max. values were recorded. See table of L.7 for details to test 4. | | | | | | |



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## Attachment No.3

| Evaluate of EN 62493:2015 | | | |
|---|---|---|---|
| Clause | Requirement - Test | Result - Remark | Verdict |

| Procedure | Products are applications with | If No | If yes |
|---|---|---|---|
| a) | Non-electronic control gear? | ☒ see Procedure b) | ☐ Pass |
| b) | Incandescent-lamp technology or halogen? | ☒ see Procedure c) | ☐ see Procedure h) |
| c) | LED light-source technology? | ☐ see Procedure d) | ☒ see Procedure h) |
| d) | OLED light-source technology? | ☐ see Procedure e) | ☐ see Procedure h) |
| e) | High-pressure discharge lamp technology? | ☐ see Procedure f) | ☐ see Procedure h) |
| f) | Low-pressure discharge lamp technologies with a measurement distance >= 50cm<br>(Distance for Hand lights, table lightings and Self-ballasted lamps is less than 50cm) | ☐ see Procedure g) | ☐ see Procedure h) |
| g) | Independent auxiliary? | ☐ see Procedure i) | ☐ see Procedure h) |
| h) | Non-wireless technology (exclude infra-red)? | ☐ see Procedure i) | ☒ Pass |
| i) | Additional test is performed and result is Pass<br>Test Report with No.: -- | ---- | ☐ Pass |



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## Attachment No.4

| VDE0620-2-1 and VDE0620-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| 5.7 | Devices with crimp connections: | | N/A |
| | For additional tests on crimp connections see Appendices D and 12.4<br>Requirements on the manufacturer<br>- Suitability of crimping tool on 50 samples<br>- Routine test during production<br>Picture documentation on devices with crimp connections see attachment | | N/A |
| 6.3 | The degree of protection of plugs for devices with detachable cord must at a minimum conform to the degree of protection of the respective device, provided it is not regulated in the product standard for the device. | | N/A |
| 8 | MARKING | | N/A |
| 8.1 | Connectors marked with: | | N/A |
| | - rated current (A) .....: | Assessed in end-use product. | N/A |
| | - rated voltage (V) .....: | | N/A |
| | - symbol for nature of supply .....: | | N/A |
| | (see section 5 GPSG)<br>a. hints for a safe use<br>b. manufacturer's or responsible vendor's name or trade mark in accordance with the GPSG on the product or packaging ..... | | N/A |
| | - type reference .....: | | N/A |
| | - symbol for degree of protection (first digit) .....: | | N/A |
| | - symbol for degree of protection (second digit) ....: | | N/A |
| | Socket-outlets with screwless terminals marked with: | | N/A |
| | - the length of insulation to be removed .....: | | N/A |
| | - an indication of the suitability to accept rigid conductors only (if any) .....: | | N/A |
| 8.2 | Symbols used: as required in the standard | | N/A |
| | Marking for the nature of supply placed next to the marking for rated current and rated voltage | | N/A |
| 8.3 | VOID | | N/A |



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Telefax : +86 20 38320478
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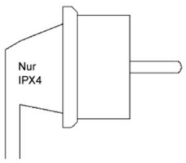
## Attachment No.4

| VDE0620-2-1 and VDE0620-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 8.4 | Plugs and portable socket-outlets: marking specified in 8.1, other than the type reference, easily discernible | Assessed in end-use product. | N/A |
| | Plugs and portable socket-outlets for equipment of class II not marked with the symbol for class II construction | | N/A |
| | Portable socket-outlets with IP-degree of protection IPX4, have to be marked with the new symbol   | | N/A |
| 8.5 | Neutral terminals: N .....: | | N/A |
| | Earthing terminals: [earth symbol] .....: | | N/A |
| | Markings not placed on screws or other easily removable parts | | N/A |
| | Terminals for conductors not forming part of the main function of the socket-outlet: | | N/A |
| | - clearly identified unless their purpose is self evident, or | | N/A |
| | - indicated in a wiring diagram fixed to the accessory | | N/A |
| | Identification of accessory terminals may be achieved by: | | N/A |
| | - their marking with graphical symbols according to IEC 147 or colours and/or alphanumeric system, or | | N/A |
| | - their physical dimension or relative location | | N/A |
| 8.6 | VOID | | N/A |
| 8.7 | VOID | | N/A |
| | Additional indication for socket-outlets intended only for mounting on certain types of surface | | N/A |
| 8.8 | Marking durable and if possible not smaller than 3 mm. Clearly readable without visual aids. Test: 15 s with water and 15 s with petroleum spirit | Assessed in end-use product. | N/A |
| 8.9 | Portable multiple socket-outlets and adaptor must have the following warnings on the equipment or in the package | | N/A |



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| VDE0620-2-1 and VDE0620-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | For portable multiple socket outlet<br>- Do not connect after each other (Nicht hintereinander stecken)<br>- Do not cover when in use (Nicht abgedeckt betreiben) | | N/A |
| | For portable multiple socket outlet with functional switch, additionally<br>- To disconnect Voltage pull the plug (Spannungsfrei nur bei gezogenem Stecker) | | N/A |
| | For adaptor<br>- Do not connect after each other (Nicht hintereinander stecken) | | N/A |
| | Portable multiple socket-outlets and extension cords shall be provided with the explanation of the using environment | | N/A |
| 8.10 | Devices used in electrical installations<br><br>On devices intended for installation, the information per Appendix E must be affixed to the smallest enclosed sales unit.<br>Appendix E Information regarding minimum knowledge in electrical engineering. | | N/A |
| | | | |
| 9 | CHECKING OF DIMENSIONS | | P |
| 9.1 | Connectors and surface-type mounting boxes comply with the appropriate standard sheets<br>DIN 49075 (Reihe), DIN 49406 (Reihe), DIN 49437, DIN 49440 (Reihe), DIN 49441 (Reihe), DIN 49442, DIN 49443, DIN 49445, DIN 49446, DIN 49447, DIN 49448, DIN 49464. | DIN 49406 Teil 1 R | P |
| | Insertion of plugs into fixed or portable socket-outlets ensured by their compliance with the relevant standard sheets | | N/A |
| | Compliance checked by measurement and by means of gauges with manufacturing tolerances as shown in table 2 | | P |
| 9.2 | It shall not be possible to engage a plug with: | | P |
| | - a socket-outlet having a higher voltage rating or a lower current rating; | | P |



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| VDE0620-2-1 and VDE0620-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - a socket-outlet with a different number of live poles (exception admitted provided that no dangerous situation can arise); | | P |
| | - a socket-outlet with earthing contact (plug for class 0 equipment). | | N/A |
| | Engagement of a plug for class 0 or class I equipment with a socket-outlet designed to accept plugs for class II equipment, not possible | | N/A |
| | Impossibility of insertion checked by applying a gauge, for 1 min, with a force of: | | P |
| | - 150 N (rated current £ 16A); | | P |
| | - 250 N (rated current > 16A) | | N/A |
| | Connectors with elastomeric or thermoplastic material: test carried out at 35 °C ± 2 °C | | P |
| 9.3 | Deviations from standard sheets made only if they provide technical advantage and do not affect the purpose and safety of Connectors complying with standard sheet | | N/A |
| | | | |
| 10 | PROTECTION AGAINST ELECTRIC SHOCK | | P |
| 10.1 | Socket-outlets: live parts not accessible | | N/A |
| | Live parts of plugs: not accessible when the plug is in partial or complete engagement with a socket-outlet | | P |
| | Test with standard test finger shown in figure 2 | | P |
| | Connectors with elastomeric or thermoplastic material: additional test carried out at 35 °C ± 2 °C with a straight unjointed test finger (75 N for 1 min) | | P |
| | During the test: Connectors not deform and no live parts accessible | | P |
| | Plugs and portable socket-outlets pressed with a force of 150 N for 5 min as shown in figure 22: specimens not show deformation | | P |
| 10.2 | Accessible parts (with exception of small screws and the like for fixing bases and covers or cover plates): made of insulating material | | P |
| | Cover or cover plates of fixed socket-outlets: made of metal if the requirements of 10.2.1 or 10.2.2 are fulfilled | | N/A |



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| VDE0620-2-1 and VDE0620-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 10.2.1 | Metal covers or cover plates protected by supplementary insulation made by insulating linings or insulating barriers | No such part | N/A |
| | Insulating linings or insulating barriers cannot be removed without being permanently damaged | | N/A |
| | Insulating linings or insulating barriers cannot be replaced in an incorrect position and, if they are omitted, Connectors are rendered inoperable or manifestly incomplete | | N/A |
| | There is no risk of accidental contact between live parts and metal covers or cover plates | | N/A |
| 10.2.2 | Metal covers or cover plates automatically connected, through a low-resistance connection, to the earth during fixing | | N/A |
| 10.3 | Connection between a pin of a plug and a live socket-contact of a socket-outlet not possible while any other pin is accessible | | N/A |
| | Compliance checked by manual test and by means of gauges with tolerances as specified in 9.1 | | N/A |
| | Connectors with elastomeric or thermoplastic material: test carried out at 35 °C ± 2 °C | | N/A |
| | Socket-outlets with enclosure or bodies of rubber or polyvinyl chloride: test carried out with a force of 75 N for 1 min | | N/A |
| | Fixed socket-outlets provided with metal covers or cover plates: clearance of at least 2 mm required between a pin and a socket-contact when another pin(s) is(are) in contact with the metal covers or cover plates .....: | mm | N/A |
| 10.4 | External parts of plugs and portable socket-outlets made of insulating material | | P |
| | Overall dimensions of rings around pins not exceed 8 mm concentric with respect to the pin | | N/A |
| 10.5 | Shuttered socket-outlets: live parts not accessible, without a plug in engagement, with the gauge shown in figure 4 | | N/A |
| | Live contacts automatically screened when the plug is withdrawn | | N/A |
| | Means cannot easily be operated by anything other than a plug and not depend upon parts which are liable to be lost | | N/A |



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| VDE0620-2-1 and VDE0620-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Gauge applied to the entry holes corresponding to live contacts with a force up to 1 N shall not touch live parts | | N/A |
| | Connectors with elastomeric or thermoplastic material: test carried out at 35 °C ± 2 °C | | N/A |
| | Shutters may not improperly hinder the plug from being inserted. The force to open the shutter may not exceed 30 N.<br>The testing is done with gauges 19a or 19b. The gauge should be aligned in a movable fashion. | | N/A |
| 10.6 | Earthing contacts of a socket-outlet designed that they cannot be deformed by the insertion of a plug | | N/A |
| 10.6.1 | The socket-outlet is placed with the outlet contacts in vertical position.<br>Gauge 14 inserted into the socket outlet with a force of 150 [+0/-5] N for 1 min. this test is conducted on new sample.<br>After this test: socket-outlet still comply with the requirements of clause 9 | | N/A |
| 10.6.2 | Side PE contacts are loaded with a torque of<br>100 [+0/-5] Ncm for 1 min.<br>With the device picture 43.<br>After this tests probe 4 must be possible to insert.<br>This test is conducted on new samples | | N/A |
| 10.7 | Socket-outlet with increased protection: live parts not accessible | | N/A |
| | Gauge of figure 4 applied with a force of 1 N on all accessible surfaces shall not touch live parts | | N/A |
| | Connectors with elastomeric or thermoplastic material: test carried out at 35 °C ± 2 °C | | N/A |
| | | | |
| 11 | PROVISION FOR EARTHING | | N/A |
| 11.1 | Earth connection made before the current-carrying contacts of the plug become live | | N/A |
| | Current-carrying pins shall separate before the earth connection is broken | | N/A |
| 11.2 | Earthing terminals of rewirable Connectors comply with clause 12 | | N/A |
| | Earthing terminals of the same size as the corresponding terminals for the supply conductors | | N/A |



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| VDE0620-2-1 and VDE0620-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Any additional external earthing terminals of fixed socket-outlets of size suitable for conductors of at least 6 $mm^2$ .....: | | N/A |
| | Earthing terminals of rewirable Connectors: internal | | N/A |
| | Earthing terminals of fixed socket-outlets: fixed to the base or to a part reliably fixed to the base | | N/A |
| | Earthing contacts of fixed socket-outlets: | | N/A |
| | - fixed to the base, or | | N/A |
| | - fixed to the cover (reliably connected to the earthing terminals; contact pieces silver plated or with adequate protection) | | N/A |
| | Parts of earthing circuit in one piece or reliably connected by riveting, welding, or the like | | N/A |
| 11.3 | VOID | | N/A |
| 11.4 | Socket-outlets, other than ordinary, with enclosure of insulating material and more than one cable inlet, provided with an internal earthing terminal for the continuity of the earthing circuit, unless | | N/A |
| | earthing terminals allows the connection of an incoming and an outgoing earthing conductor together | | N/A |
| 11.5 | Connection between earthing terminal and accessible metal parts: of low resistance | | N/A |
| | Test: | | N/A |
| | Test current equal to 1,5 times the rated current or 25 A (A) .....: | | ¾ |
| | Resistance not exceed 0,05 W(W) .....: | | N/A |
| | | | |
| 12 | TERMINALS | | P |
| | All the test on terminals, with the exception of the test of 12.3 11, made after the test of clause 16 | | P |
| 12.1 | General | | P |
| 12.1.1 | Rewirable fixed socket-outlets provided with screw-type terminals or with screwless terminals ..: | | N/A |
| | Rewirable plugs and portable socket-outlets provided with terminals with screw clamping .....: | | N/A |



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| VDE0620-2-1 and VDE0620-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Pre-soldered flexible conductors used: pre-soldered area outside the squeezed area of screw-type terminals | | N/A |
| | Clamping means of terminals: not serve to fix any other components | | N/A |
| 12.1.2 | Non-rewirable Connectors provided with soldered, welded, crimped or equally effective permanent connections .....: | | P |
| | Screwed or snap-on connections not used | | P |
| | Connections made by crimping a pre-soldered flexible conductor not permitted | | N/A |
| 12.2 | Terminals with screw clamping for external copper conductors | | N/A |
| 12.2.1 | Connectors provided with terminals which allows the proper connection of copper conductors as shows in table 3 | | N/A |
| | Rated current (A); Type of Connectors .....: | | ¾ |
| | Type of conductor (rigid / flexible) .....: | | ¾ |
| | Smallest / largest cross-sectional area ($mm^2$) .....: | | ¾ |
| | Diameter of the largest conductor (mm) .....: | | ¾ |
| | Figure of terminal .....: | | ¾ |
| | Minimum diameter D (minimum dimensions) of conductor space: required (mm); measured (mm) .: | | N/A |
| 12.2.2 | Terminals allow the conductor to be connected without special preparation | | N/A |
| 12.2.3 | Terminals have adequate mechanical strength | | N/A |
| | Screws and nut for clamping the conductors have metric ISO thread or a comparable thread | | N/A |
| | Screws not of soft metal such as zinc or aluminium | | N/A |
| 12.2.4 | Terminals resistant to corrosion | | N/A |
| 12.2.5 | Screw-type terminals clamp the conductor(s) without undue damage | | N/A |
| | Test with apparatus shown in figure 32: | | N/A |
| | - type of conductors .....: | rigid solid / rigid stranded / flexible | ¾ |
| | - number of conductors .....: | | ¾ |
| | - smallest cross-sectional area ($mm^2$) (table 3); diameter of bushing hole (mm); height H (mm); mass (kg) .....: | | N/A |



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| VDE0620-2-1 and VDE0620-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - largest cross-sectional area (mm²) (table 3); diameter of bushing hole (mm); height H (mm); mass (kg) .....: | | N/A |
| | - nominal diameter of thread (mm); torque according to table 6 (Nm) .....: | | ¾ |
| | During the test: conductor not slip out, no break near clamping unit and no damage | | N/A |
| 12.2.6 | Terminals clamp the conductor reliably between metal surfaces | | N/A |
| | Pull test (1 min): | | N/A |
| | - type of conductors .....: | rigid solid / rigid stranded / flexible | ¾ |
| | - number of conductors .....: | | ¾ |
| | - smallest cross-sectional area (mm²) (table 3); pull (N) .....: | | N/A |
| | - largest cross-sectional area (mm²) (table 3); pull (N) .....: | | N/A |
| | - torque (Nm) (2/3 table 6) .....: | | ¾ |
| | During the test: conductor not move noticeably | | N/A |
| 12.2.7 | Terminals designed or placed that the conductor cannot slip out while the clamping screws or nuts are tightened | | N/A |
| | - largest cross-sectional area (mm²) (table 3) .....: | | ¾ |
| | - number of wires and nominal diameter of wires (table 5): | | |
| | fixed socket-outlets: rigid solid conductors / rigid stranded conductors .....: | 1 x / 7 x | ¾ |
| | plugs and portable socket-outlets: flexible conductors .....: | | ¾ |
| | - terminals intended for looping-in 2 or 3 conductors: permissible number of conductors.....: | | ¾ |
| | - torque (Nm) (2/3 table 6) .....: | | ¾ |
| | After the test: no wire of the conductor escaped outside the clamping unit | | N/A |
| 12.2.8 | Terminals not work loose from their fixing to Connectors | | N/A |
| | Torque test: | | N/A |
| | - rigid solid copper conductor of the largest cross-sectional area (mm²) (table 3) .....: | | ¾ |



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| VDE0620-2-1 and VDE0620-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - torque (Nm) (table 6 or appropriate figures 34, 35, 36) .....: | | ¾ |
| | Screws and nuts tightened and loosened 5 times. During the test: terminals not work loose and show no damage | | N/A |
| 12.2.9 | Clamping screws or nuts of earthing terminals: adequately locked against accidental loosening, not possible to loosen them without the aid of a tool | | N/A |
| 12.2.10 | Earthing terminals: no risk of corrosion | | N/A |
| | Body of brass or other metal no less resistant to corrosion | | N/A |
| | If the body is a part of a frame or enclosure of aluminium alloy, precautions shall be taken to aVOID the risk of corrosion | | N/A |
| 12.2.11 | Pillar terminals: distance *g* no less than the value specified in figure 34: required (mm); measured (mm) .....: | | N/A |
| | Mantle terminals: distance *g* no less than the value specified in figure 37: required (mm); measured (mm) .....: | | N/A |
| 12.3 | VOID | | N/A |
| 12.4 | **Special requirements on picture documentation** | | N/A |
| | **Crimp connections**<br>Crimp connections of non-rewirable plugs and non-rewirable portable socket-outlets must exhibit sufficient electrical and mechanical properties. A picture documentation must be generated from 3 sides of at least 3 points of contact, consisting of side view, top view and perspective view. **The values for crimp height, withdrawal force or voltage drop (upper and lower limit) must be determined and documented by the manufacturer; these will be the basis for the routine tests during production.** | | N/A |
| | | | |
| 13 | VOID | | N/A |
| | | | |
| 14 | CONSTRUCTION OF PLUGS AND PORTABLE SOCKET-OUTLETS | | P |
| 14.1 | Non-rewirable plug or non-rewirable portable socket-outlet: | | P |



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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | flexible cable cannot be separated from the accessory without making it permanently useless | | N/A |
| | Accessory cannot be opened by hand or by using a general purpose tool, for example a screwdriver used as such | | P |
| 14.2 | Pins of plugs and portable socket-outlets: adequate mechanical strength | | P |
| | Test for pins not solid (made after clause 21): force of 100 N exerted on the pin for 1 min by means of a steel rod Ø 4,8 mm | | N/A |
| | During the application of the force: reduction of the dimension of the pin not exceed 0,15 mm | Solid pins | N/A |
| | After removal of the rod: dimensions of the pin not changed by more than 0,06 mm | | N/A |
| 14.3 | Pins of plugs: | | P |
| | - locked against rotation | | P |
| | - not removable without dismantling the plug | | P |
| | - adequately fixed in the body of the plug when the plug is wired and assembled as in normal use | | P |
| | Earthing or neutral pins or contacts of plugs: not possible to insert in an incorrect position | No earthing pin | N/A |
| 14.4 | Earthing contacts and neutral contacts of portable socket-outlets: | | N/A |
| | - locked against rotation | | N/A |
| | - removable only with the aid of a tool, after dismantling the socket-outlet | | N/A |
| 14.5 | Socket-contact assemblies: sufficient resiliency | | N/A |
| | Parts of contacts with the pin are: | | N/A |
| | - not from insulation material | | N/A |
| | - in contact with pin at least in two opposite positions | | N/A |
| 14.6 | Pins and socket-contacts: resistant to corrosion and abrasion | | P |
| 14.7 | Enclosures of rewirable Connectors: completely enclose terminals and ends of flexible cable. | | N/A |
| | Construction of rewirable Connectors: | | N/A |
| | - conductors can be properly connected | | N/A |
| | - cores not pressed against each other | | N/A |
| | - cores of live conductor not in contact with accessible metal parts | | N/A |



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| VDE0620-2-1 and VDE0620-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - core of earthing conductor not in contact with live parts | | N/A |
| 14.8 | Rewirable Connectors: terminal screws or nuts cannot become loose and fall out of position and establish an electrical connection between live parts and earthing terminal or metal parts | | N/A |
| 14.9 | Rewirable Connectors with earthing contact: ample space for slack of earthing (test) | | N/A |
| | Non-rewirable non-moulded-on Connectors with earthing contact: current-carrying conductors stressed before the earthing conductor if the flexible cable slips in its anchorage | No earthing contact | N/A |
| 14.10 | Terminals of rewirable Connectors and terminations of non-rewirable Connectors: located and shielded that loose wires not present a risk of electric shock | | P |
| 14.10.1 | Rewirable Connectors: test with 6 mm free wire | | N/A |
| | free wire of a conductor connected to a live terminal not touch any accessible metal part or able to emerge from the enclosure | | N/A |
| | free wire of a conductor connected to an earthing terminal not touch a live part | | N/A |
| 14.10.2 | Non-rewirable, non-moulded-on Connectors: test with a free wire of length equivalent to the maximum designed stripping length declared by the manufacturer plus 2 mm | | P |
| | free wire of a conductor connected to a live termination not touch any accessible metal part or reduce creepage and clearance below 1,5 mm to the external surface | | P |
| | free wire of a conductor connected to an earth termination not touch any live part | | N/A |
| 14.10.3 | Non-rewirable, moulded-on Connectors: | | N/A |
| | Verification of means to prevent stray wires reducing the minimum distance through insulation to external accessible surface below 1,5 mm | | N/A |
| 14.11 | Rewirable plugs and rewirable portable socket-outlets: | | N/A |
| | - clear how relief from strain and prevention of twisting is intended to be effected | | N/A |
| | - cord anchorage, or at least part of it, integral with or permanently fixed to one of the component parts of the plug or portable socket-outlet | | N/A |



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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - makeshift methods not used | | N/A |
| | - cord anchorage suitable for the different types of flexible cable which may be connected; screws, if any: not serve to fix any other component | | N/A |
| | - cord anchorages: of insulating material or provided with an insulating lining fixed to the metal parts | | N/A |
| | - metal parts of cord anchorages, including clamping screws: insulated from the earthing circuit | | N/A |
| 14.12 | Insulating parts which keep live parts in position: reliably fixed together; not possible to dismantle the accessory without the aid of a tool | | N/A |
| 14.13 | Covers of portable socket-outlets: bushings for entry holes for the pins not removable from the outside or detachable inadvertently from the inside | | N/A |
| 14.14 | Screws intended to allow access to interior of the accessory: captive | | N/A |
| 14.15 | Engagement face of plugs: no projections | | P |
| 14.16 | Engagement face of portable socket-outlets: no projection | | N/A |
| 14.17 | Connectors other than ordinary: provided with gland(s) or the like | | N/A |
| | Plugs other than ordinary: adequately enclosed | Ordinary | N/A |
| | Portable socket-outlets other than ordinary: adequately enclosed without a plug in engagement | | N/A |
| | Lid springs (if any): of corrosion resistant material (bronze or stainless steel) | | N/A |
| 14.18 | Portable socket-outlets with means for permanent mounting shall be tested as fixed outlets with a current acc. to table 20, glow wire test 28.1.1 and additionally for strength to 24.1 | | N/A |
| | No free openings between space intended for suspension means fixed to the wall and live parts | | N/A |
| 14.19 | Combinations of plugs and socket-outlets with circuit-breakers or other protective devices comply with relevant standards, if any .....: | | N/A |



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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 14.20 | Portable Connectors: not integral part of lampholders<br>Adaptors without interposed auxiliaries (switches, regulators, timers etc.) shall comply with DIN 49437<br>Multiple outlets with earthing contact and with stiffly mounted plug are not allowed | | N/A |
| 14.21 | Plugs for equipment of class II: | | P |
| | - non-rewirable | | P |
| | - if incorporated in a cord set: provided with a connector for equipment of class II | | N/A |
| | - if incorporated in a cord extension set: provided with a portable socket-outlet for equipment of class II | | N/A |
| 14.22 | Components (switches and fuses) incorporated in Connectors: comply with the relevant IEC standard | | N/A |
| 14.23 | Plug-in equipment: not cause overheating of the pins or impose undue strain | | P |
| | Plugs with rating above 16 A and 250 V: not integral part of other equipment | | N/A |
| | Tests for two-pole plugs, with or without earthing contact, with rating up to and including 16 A and 250 V (plug of equipment inserted into a fixed socket-outlet complying with this standard): | | P |
| 14.23.1 | Socket-outlet connected to a supply voltage equal to 1,1 times the highest rated voltage of the equipment (V) .....: | | ¾ |
| | Temperature rise of the pins after 1 h not exceed 45 K (K) .....: | Covered by clause 19 | P |
| 14.23.2 | Additional torque applied to the socket-outlet to maintain the engagement face in the vertical plane not exceed 0,25 Nm (Nm) .....: | <0,05 Nm | P |
| 14.24 | Plugs: can easily withdrawn by hand from the relevant socket-outlet | | P |
| | Gripping surfaces: so designed that the plug can be withdrawn without pull on the flexible cable | | P |
| 14.25 | Membranes in inlet openings: meet the requirements of 13.23 and 13.24 | | N/A |
| 14.26 | Plugs and socket outlets on intermediate adaptors shall comply with DIN 49440 and 49441 | | N/A |



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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Intermediate adaptors must be so constructed and the connection of the cord so manufactured that the efficacy of the protective measures is assured. | | N/A |
| | One constructive unit may only accommodate one plug and one socket outlet. | | N/A |
| | The cord shall be at least 1.4m long. Length… | | N/A |
| | Intermediate adaptors shall not impose undue strain on the socket outlet. (0,25Nm) | | N/A |
| 14.27 | The length of the cord for table-top outlets shall be at least 1,4m. Length….. | | N/A |
| | For cords in spiral form the length is measured when stretched under own weight. | | N/A |
| 14.28 | Portable socket-outlets with self-closing lids for securing the protection degree higher or equal to IPX4 shall be constructed that the correct functioning of the self-closing lid is ensured during intended use.<br>Compliance on portable socket-outlet with self-closing lid is checked by inspection and test according to 24.20 | | N/A |
| | In case of no-self-closing lids, the lid shall be fixed sufficiently to the portable socket-outlet.<br>Compliance on portable socket-outlet with non-self-closing lid is checked by inspection and test according to 24.21 | | N/A |
| | | | |
| 15 | KEEP FREE | | N/A |
| | | | |
| 16 | RESISTANCE TO AGEING, TO HARMFUL INGRESS OF WATER AND TO HUMIDITY | | P |
| 16.1 | Resistance to ageing | | P |
| | Connectors shall be resistant to ageing | | P |
| | Connectors subjected to a test in a heating cabinet at 70 °C ± 2 °C for seven days (168 h) | | P |
| | After the tests, samples shall show: | | P |
| | - no crack visible with normal or corrected vision without additional magnification | | P |
| | - no sticky or greasy material | | P |



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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - no trace of cloth (forefinger pressed with 5 N) | | P |
| | - no damage | | P |
| 16.2 | Resistance to harmful ingress of water | | N/A |
| | Enclosure of Connectors other than ordinary shall provide a degree of protection against harmful ingress of water in accordance with the classification | | N/A |
| 16.2.1 | Flush-type and semi flush-type socket-outlets fixed: | | N/A |
| | - in a test wall using an appropriate box in accordance with the manufacturer's instructions | | N/A |
| | - in a test wall according to figure 41 | | N/A |
| | Portable socket-outlets tested on a plain, horizontal surface in a position as in normal use and fitted with flexible cables according to table 17 having the largest and smallest cross-sectional area given in table 3: | | N/A |
| | - largest cross-sectional area ($mm^2$); type of cable (table 27) .....: | | ¾ |
| | - smallest cross-sectional area ($mm^2$); type of cable (table 27) .....: | | ¾ |
| | Mounting screws tightened with a torque equal to 2/3 of the torque given in table 6 (Nm) .....: | | ¾ |
| | Glands tightened with a torque equal to 2/3 of the torque applied during the test of 24.6 (Nm) .....: | | ¾ |
| | Fixed and portable socket-outlets tested without and with a plug in engagement | | N/A |
| | Plugs tested with in full engagement with: | | N/A |
| | - a fixed socket-outlets | | N/A |
| | - a portable socket-outlets | | N/A |
| | of the same system and with the same degree of protection against water | | ¾ |
| 16.2.2 | Splash-proof Connectors subjected to the test IPX4 according to IEC 529 | | N/A |
| 16.2.3 | Jet-proof Connectors subjected to the test IPX5 according to IEC 529 | | N/A |
| 16.2.4 | Specimens withstand an electric strength test specified in 17.2 which is started within 5 min after the IP test | | N/A |
| 16.3 | Resistance to humidity | | P |



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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Connectors proof against humidity which may occur in normal use | | P |
| | Compliance checked by a humidity treatment carried out in a humidity cabinet containing air with relative humidity maintained between 91 % and 95 % | 93 % | P |
| | Specimens kept in the cabinet for: | | P |
| | - two days (48 h) for ordinary Connectors | | P |
| | - seven days (168 h) for Connectors other than ordinary | | N/A |
| | After this treatment the specimens show no damage | | P |
| | | | |
| 17 | INSULATION RESISTANCE AND ELECTRIC STRENGTH | | P |
| 17.1.1 | For socket-outlets: insulation resistance (500 V d.c. for 1 min): | | N/A |
| | a) between all poles connected together and the body, with a plug in engagement ³ 5 MW .....: | MW | N/A |
| | b) between each pole in turn and all others connected to the body, with a plug in engagement ³ 5 MW .....: | MW | N/A |
| | c) between any metal enclosures and metal foil in contact with the inner surface of its insulating linings, if any ³ 5 MW.....: | MW | N/A |
| | d) between any metal part of the cord anchorage, including clamping screws, and earthing terminal or earthing contact, if any, of portable socket-outlets ³ 5 MW .....: | MW | N/A |
| | e) between any metal part of the cord anchorage of portable socket-outlets and a metal rod of the maximum diameter of the flexible cable inserted in its place ³ 5 MW.....: | MW | N/A |
| 17.1.2 | For plugs: insulation resistance (500 V d.c. for 1 min): | | P |
| | a) between all poles connected together and the body ³ 5 MW.....: | >500MW | P |
| | b) between each pole in turn and all others connected to the body ³ 5 MW.....: | >500MW | P |
| | c) between any metal part of the cord anchorage, including clamping screws, and earthing terminal or earthing contact, if any ³ 5 MW .....: | MW | N/A |



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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | d) between any metal part of the cord anchorage and a metal rod of the maximum diameter of the flexible cable inserted in its place ³ 5 MW.....: | MW | N/A |
| 17.2 | Socket-outlets: electric strength, test voltage (a.c., for 1 min): | | N/A |
| | a) test voltage (V) .....: | 2000 V | N/A |
| | b) test voltage (V) .....: | 1250 V / 2000 V | N/A |
| | c) test voltage (V) .....: | 1250 V / 2000 V | N/A |
| | d) test voltage (V) .....: | 1250 V / 2000 V | N/A |
| | e) test voltage (V) .....: | 1250 V / 2000 V | N/A |
| | Plugs: electric strength, test voltage (a.c., for 1 min): | | P |
| | a) test voltage (V) .....: | 2000 V | P |
| | b) test voltage (V) .....: | 2000 V | P |
| | c) test voltage (V) .....: | 1250 V / 2000 V | N/A |
| | d) test voltage (V) .....: | 1250 V / 2000 V | N/A |
| | During the test no flashover or breakdown | | P |
| | | | |
| 18 | OPERATION OF EARTHING CONTACTS | | N/A |
| 18.1 | Earthing contacts provide adequate contact pressure and not deteriorate in normal use | | N/A |
| | Compliance checked by the tests of clauses 19 and 21 | | N/A |
| | Force exerted measured in side earthing contacts not less than 5 N (CEE 7 clause 18) .....: | | N/A |
| 18.2 | Earthing contacts provide adequate contact pressure and not deteriorate in normal use. | | N/A |
| | The test is conducted with the equipment in figure 15 at 35 ±2 C with a force of 50 [N] applied in 168 [h]. The force must be applied where the contact takes place with the fully inserted plug. | | N/A |
| | Compliance checked by measuring the change in the contact 30 seconds after the force is withdrawn. The change shall not deviate more than 1 [mm] from the measurement determined in clause 9. | | N/A |



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

| | | | |
|---|---|---|---|
| 19 | TEMPERATURE RISE | | P |
| | Connectors and accessories have to be constructed that they can pass the following heating tests. | | P |
| | Temperature rise on touchable metal parts not exceed 40 K and on touchable not metal covers not exceed 60 K | | P |
| 19.1 | KEEP FREE | | N/A |
| 19.2 | Portable outlets | | N/A |
| | Portable outlets with cable are tested as delivered: | | N/A |
| | - type of flexible cable; number of conductors and nominal cross-sectional area ($mm^2$).....: | | ¾ |
| | - rated current of accessory .....: | | ¾ |
| | - nominal cross-sectional area ($mm^2$) .....: | | ¾ |
| | - type of conductors .....: | rigid solid / rigid stranded / flexible | ¾ |
| | Rewirable outlets without cable are to be fitted with polyvinyl chloride insulated conductors having a nominal cross-sectional area as show in table 15: | | N/A |
| | Outlets are tested with a test plug according to figure 16 | | N/A |
| | Non-rewirable plugs of extension cords and multiple socket outlets are to be tested with a test current according to table 20 for non-rewirable sockets or rewirable connectors. | | N/A |
| 19.2.1 | Portable outlets without accessories | | N/A |
| | Outlets are tested for 1h with an AC current according to table 20 | | N/A |
| | The temperature rise of terminals and internal connections must not exceed 45 K. | Measured: | N/A |
| 19.2.2 | Portable outlets with accessories | | N/A |
| | Outlets are tested as follows:<br>Rated current for 1 h or until tripping of an internal protection device.<br>The temperature rise of terminals and internal connections of accessories must not exceed the limits given in the related standards.<br>The temperature rise of all other terminals and internal connections must not exceed 45 K | | N/A |



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| VDE0620-2-1 and VDE0620-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | After that outlets are tested with a test current according to table 20 for 1 h or until tripping of an internal protection device.<br>If an internal protection device operates the test has to be repeated (for 1 h) with a current of 0.95 times the tripping current of the protection device.<br>If the internal protection device is a fuse according to EN 60127-2 the test has to be repeated with 1,5 times the rated fuse current for<br>1 h for a rated fuse current up to 6.3 A<br>30 min for a rated fuse current above 6.3 A<br><br>The temperature rise of terminals and internal connections must not exceed 70 K<br>The temperature rise of the plug socket must not exceed 45 K | Measured:<br><br>Measured: | N/A |
| 19.3 | Plugs | | P |
| | Plugs with cable are tested as delivered: | | N/A |
| | - type of flexible cable; number of conductors and nominal cross-sectional area ($mm^2$).....: | | ¾ |
| | - rated current of accessory .....: | | ¾ |
| | - nominal cross-sectional area ($mm^2$) .....: | | ¾ |
| | - type of conductors .....: | rigid solid / rigid stranded / flexible | ¾ |
| | Rewirable outlets without cable are to be fitted with polyvinyl chloride insulated conductors having a nominal cross-sectional area as show in table 15: | | N/A |
| | An appropriate (normal outlet) testing outlet with thermo couple on each pin and PE contact will be attached to the plug. | | P |
| 19.3.1 | Plug without accessories | | P |
| | Plugs are tested for 1h with an AC current according to table 20 | Tested with driver | P |
| | The temperature rise of terminals and internal connections must not exceed 45 K. | Measured:<br>L/N(Max): 9.4 K | P |
| 19.3.2 | Plug with accessories | | N/A |



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| VDE0620-2-1 and VDE0620-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| | Rewirable Plugs are tested as follows:<br>Rated current for 1 h or until tripping of an internal protection device.<br>The temperature rise of terminals and internal connections of accessories must not exceed the limits given in the related standards.<br>The temperature rise of all other terminals and internal connections must not exceed 45 K | | N/A |
| | Non-Rewirable Plugs are tested as follows:<br>Rated current for 1 h or until tripping of an internal protection device.<br>The temperature rise of terminals and internal connections of accessories must not exceed the limits given in the related standards.<br>The temperature rise of all other terminals and internal connections must not exceed 45 K | | N/A |
| | After that plugs are tested with a test current according to table 20 for 1 h or until tripping of an internal protection device.<br>If an internal protection device operates the test has to be repeated (for 1 h) with a current of 0.95 times the tripping current of the protection device.<br>If the internal protection device is a fuse according to EN 60127-2 the test has to be repeated with 1,5 times the rated fuse current for<br>1 h for a rated fuse current up to 6.3 A<br>30 min for a rated fuse current above 6.3 A<br><br>The temperature rise of terminals and internal connections must not exceed 70 K<br>The temperature rise of the plug socket must not exceed 45 K | Measured:<br><br>Measured: | N/A |
| 19.4 | Adaptor plug | | N/A |
| | Adaptor-outlets are tested with a test plug according to figure 16 | | N/A |
| | For adaptor-plugs an appropriate (normal outlet) testing outlet with thermo couple on each pin and PE contact will be attached to the plug. | | N/A |
| 19.4.1 | Adaptor without accessories (Adaptor according to DIN 49437) | | N/A |
| | Adaptors are tested for 1h with an AC current according to table 20 | | N/A |
| | The temperature rise of terminals and internal connections must not exceed 45 K. | Measured: | N/A |



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

| | | | |
|---|---|---|---|
| 19.4.2 | Adaptor with accessories | | N/A |
| | Adaptors with cable are tested as delivered: | | N/A |
| | - type of flexible cable; number of conductors and nominal cross-sectional area ($mm^2$).....: | | ¾ |
| | - rated current of accessory .....: | | ¾ |
| | - nominal cross-sectional area ($mm^2$) .....: | | ¾ |
| | - type of conductors .....: | rigid solid / rigid stranded / flexible | ¾ |
| | Rewirable adaptors without cable are to be fitted with polyvinyl chloride insulated conductors having a nominal cross-sectional area as show in table 15: | | N/A |
| | Adaptors are tested as follows:<br>Rated current for 1 h or until tripping of an internal protection device.<br>The temperature rise of terminals and internal connections of accessories must not exceed the limits given in the related standards.<br>The temperature rise of all other terminals and internal connections must not exceed 45 K | | N/A |
| | After that adaptors are tested with a test current according to table 20 for 1 h or until tripping of an internal protection device.<br>If an internal protection device operates the test has to be repeated (for 1 h) with a current of 0.95 times the tripping current of the protection device.<br>If the internal protection device is a fuse according to EN 60127-2 the test has to be repeated with 1,5 times the rated fuse current for<br>1 h for a rated fuse current up to 6.3 A<br>30 min for a rated fuse current above 6.3 A<br><br>The temperature rise of terminals and internal connections must not exceed 70 K<br>The temperature rise of the plug socket must not exceed 45 K | Measured:<br><br>Measured: | N/A |
| 19.5 | Plug-in devices | | N/A |
| | Plug-in devices are tested according to the related product standard.<br>For testing of the plug see 14.23. | | N/A |



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

| | | | |
|---|---|---|---|
| | | | |
| 20 | BREAKING CAPACITY | | N/A |
| | Connectors shall have adequate breaking capacity | | N/A |
| | Compliance checked by testing: | | N/A |
| | - socket-outlets; | | N/A |
| | - plugs with pins which are not solid | | N/A |
| | Test conditions: | | N/A |
| | - 100 strokes; rate of operation .....: | | ¾ |
| | - test voltage (1,1 Vn) .....: | | ¾ |
| | - test current (1,25 In) (power factor 0,6) .....: | | ¾ |
| | Multiple socket-outlets: test carried out on one socket-outlet of each type and current rating | | N/A |
| | During the test: no sustained arcing occur | | N/A |
| | After the test: | | N/A |
| | - specimens show no damage impairing their further use; | | N/A |
| | - entry holes for the pins not show any damage which may impair the safety | | N/A |
| | | | |
| 21 | NORMAL OPERATION | | N/A |
| | Connectors shall withstand without excessive wear or other harmful effect, the mechanical, electrical and thermal stresses occurring in normal use | | N/A |
| | Compliance for socket-outlets as well as plugs with resilient earthing contacts or non solid pins is checked by testing, see figure 17. | | N/A |
| | - socket-outlets; | | N/A |
| | - plugs with resilient earthing socket-contacts; | | N/A |
| | - plugs with pins which are not solid | | N/A |
| | Test performed on: | | N/A |
| | - complete shuttered socket-outlets | | N/A |
| | - specimens prepared by the manufacturer without shutters (with current flowing). Number of strokes: | | N/A |



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| Clause | Requirement + Test | Result - Remark | Verdict |
| | - specimens with shutters (without current flowing) | | N/A |
| | - complete shuttered socket-outlets with operations made by hand as in normal use | | N/A |
| | Test conditions: | | N/A |
| | - 10000 strokes; rate of operation .....: | | ¾ |
| | - test voltage Vn (V) .....: | | ¾ |
| | - test current (as specified in table 20) (A) (power factor 0,8) .....: | | ¾ |
| | Test current passed: | | N/A |
| | - during each insertion and withdrawal of the plug (In £ 16A) | | N/A |
| | - during alternate insertion and withdrawal, the other insertion and withdrawal being made without current flowing (In > 16A) | | N/A |
| | Multiple socket-outlets: test carried out on one socket-outlet of each type and current rating | | N/A |
| | During the test: no sustained arcing occur | | N/A |
| | After the test the specimens shall not show: | | N/A |
| | - wear impairing their further use; | | N/A |
| | - deterioration of enclosures, insulating lining or barriers; | | N/A |
| | - damage to the entry holes for the pins, that might impair proper working; | | N/A |
| | - loosening of electrical or mechanical connections; | | N/A |
| | - seepage of sealing compound | | N/A |
| | Shuttered socket-outlets: the following gauges not touch live parts when they remain under the relevant forces: | | N/A |
| | - gauges of figure 15 applied with a force up to 20 N | | N/A |
| | - steel gauge of figure 13 applied with a force up to 1 N | | N/A |
| | Temperature-rise test (requirements of clause 19): | | N/A |
| | Test current as required for the normal operation test, given in table 20, passed for 1 h (A) .....: | | ¾ |
| | Temperature rise of terminals not exceed 45 K (K) .....: | | N/A |



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| Clause | Requirement + Test | Result - Remark | Verdict |
| | Separate tests made passing the current through: | | N/A |
| | - the neutral contact, if any, and the adjacent phase contact (K) .....: | | N/A |
| | - the earthing contact, if any, and the nearest phase contact (K) .....: | | N/A |
| | Socket-outlets: electric strength (sub-clause 17.2), test voltage (a.c., for 1 min): | | N/A |
| | a) test voltage (V) .....: | 1500 V | N/A |
| | b) test voltage (V) .....: | 1000 V / 1500 V | N/A |
| | c) test voltage (V).....: | 1000 V / 1500 V | N/A |
| | d) test voltage (V) .....: | 1000 V / 1500 V | N/A |
| | e) test voltage (V) .....: | 1000 V / 1500 V | N/A |
| | Plugs: electric strength (sub-clause 17.2), test voltage (a.c., for 1 min): | | N/A |
| | a) test voltage (V) .....: | 1000 V / 1500 V | N/A |
| | b) test voltage (V) .....: | 1000 V / 1500 V | N/A |
| | c) test voltage (V).....: | 1000 V / 1500 V | N/A |
| | d) test voltage (V) .....: | 1000 V / 1500 V | N/A |
| | During the test: no flashover or breakdown | | N/A |
| | Fixed socket-outlets: test according to 13.1 | | N/A |
| | Pins of plugs and portable socket-outlets: test according to 14.2 | | N/A |
| | Force exerted measured in side earthing contacts not less than 60 % or 5 N (CEE 7 clause 18) .....: | | N/A |
| | The force to open the shutter may not exceed 50 N, as specified in the normal operation test.<br>The test is done with gauges 19a or 19b. | | N/A |
| | | | |
| 22 | FORCE NECESSARY TO WITHDRAW THE PLUG | | N/A |
| | Construction of accessory shall allow the easy insertion and withdrawal of the plug, and prevent the plug from working out of the socket-outlet in normal use | | N/A |
| | Rated current (A) .....: | | N/A |
| | Number of poles .....: | | N/A |
| 22.1 | Verification of the maximum withdrawal force | | N/A |



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|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 22.1.1 | Test for Socket outlet(multi-pin gauge) | | N/A |
| | - Maximum withdrawal force (N) .....: | | ¾ |
| | The plug not remain in the socket-outlet | | N/A |
| 22.1.2 | Test for plugs with spring-loaded earth contact arrangements | | N/A |
| | The test probe gauge, represented in gauge 16e, is used for the spring-loaded earth contact arrangement when the plug is held vertically and the gauge hangs down. The test probe gauge is made of hardened steel with a surface roughness between<br>0.6 µm and 0,8 µm over its usable length. | | N/A |
| 22.2 | Verification of the minimum withdrawal force (single-pin gauge) | | N/A |
| | - Minimum withdrawal force (N) .....: | | ¾ |
| | The plug not fall from each individual contact-assembly within 30 s | | N/A |
| | | | |
| 23 | FLEXIBLE CABLES AND THEIR CONNECTION | | N/A |
| 23.1 | Rewirable plugs and rewirable portable socket-outlets provided with a cord anchorage such that the conductors at the terminals are relieved from strain and twisting and that their covering is protected from abrasion | Assessed in end-use product. | N/A |
| | Sheath of flexible cable clamped within the cord anchorage | | N/A |
| | Non-rewirable plugs and non-rewirable portable socket-outlets so designed that the cord is kept in position and the connections are relieved from strain and twisting. | | N/A |
| | Sheath of flexible cable clamped within the connector. | | N/A |
| 23.2 | Pull and torque test | | N/A |
| | The accessory is conditioned at 45˚C for 1h. Directly there after (while hot) a pull test is conducted with 50N for 30s, The anchorage shall remain functional but displacement of the cord may not exceed 2mm. Thereafter the samples are cooled down to ambient temperature for the further tests below | | N/A |
| | Non-rewirable accessories: | | N/A |
| | - rating of accessory .....: | | ¾ |



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| VDE0620-2-1 and VDE0620-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - type of flexible cable; number of conductors and nominal cross-sectional area ($mm^2$) .....: | | ¾ |
| | - pull (100 times) (N) .....: | | N/A |
| | - torque (1 min) as specified in table 18 (Nm) .....: | | N/A |
| | After the test: | | N/A |
| | Displacement £ 2 mm .....: | | N/A |
| | No break in the electrical connections | | N/A |
| | Rewirable accessories: | | N/A |
| | - rating of accessory .....: | | ¾ |
| | - clamping screws, if any, tightened with a torque equal to 2/3 of that specified in 12.2.8 (Nm) .....: | | ¾ |
| | - type of flexible cable; number of conductors and smallest nominal cross-sectional area ($mm^2$) as show in table 17 .....: | | ¾ |
| | - pull (100 times) (N) .....: | | N/A |
| | - torque (1 min) as specified in table 18 (Nm) .....: | | N/A |
| | After the test: | | N/A |
| | Displacement £ 2 mm .....: | | N/A |
| | End of conductors not have moved noticeably in the terminals | | N/A |
| | - type of flexible cable; number of conductors and largest nominal cross-sectional area ($mm^2$) as show in table 17 .....: | | ¾ |
| | - pull (100 times) (N) .....: | | N/A |
| | - torque (1 min) as specified in table 18 (Nm) .....: | | N/A |
| | After the test: | | N/A |
| | Displacement £ 2 mm .....: | | N/A |
| | End of conductors not have moved noticeably in the terminals | | N/A |
| | Rewirable accessories having rated current up to and including 16 A: | | N/A |
| | Suitable for fitting with the appropriate cable as shown in table 19 | | N/A |
| | Type of flexible cable; number of conductors and nominal cross-sectional area ($mm^2$).....: | | ¾ |



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| VDE0620-2-1 and VDE0620-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 23.3 | Non-rewirable plugs and portable socket-outlets shall be provided with a flexible cable complying with DIN VDE 0281 or DIN VDE 0282. Cross sectional area see table 20. Non-rewirable plugs may have other types or cord if permitted by other German standards<br>A cable equipped with rewirable plug or portable socket outlet shall be of the same quality. | | N/A |
| | Flexible cables have the same number of conductors as there are poles in the plug or socket-outlet | | N/A |
| | Conductor connected to the earthing contact: identified by the colour combination green/yellow | | N/A |
| | Non-rewirable plugs rated 16A/250V are tested:<br>1mm$^2$ and 1.5mm$^2$ at 16A/20A | | N/A |
| | Extension cords and multiple connectors (table-type socket-outlets) without built-in safety device and its individual components must be designed for a rated current of 16 amps.<br><br>A reduced cross-section below 1.5 mm² up to and including 1.0 mm² of the cable is acceptable only when a fuse or protection unit is installed that is related to the rated current of the cable.<br><br>Extension cords and multiple connectors with cable and plug (table-type socket-outlet) are tested in assembled condition as one unit. | | N/A |
| 23.4 | Plugs and portable socket-outlets with cord connected: designed that the flexible cable is protected against excessive bending | | N/A |
| | Guards shall be of insulating material and fixed in reliable manner | | N/A |
| | Flexing test (10.000 flexings): | | N/A |
| | - type of flexible cable and nominal cross-sectional area (mm$^2$) .....: | | ¾ |
| | - test current (A) .....: | | ¾ |
| | - mass (N) .....: | | ¾ |
| | During the test: no interruption of the test current and no short-circuit between conductors | | N/A |



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| VDE0620-2-1 and VDE0620-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | Voltage drop test: test current (A); voltage drop (£ 10 mV) .....: | | N/A |
| | After the test: guard no separated from the body, insulation shows no sign of abrasion or wear, broken strands become no accessible | | N/A |
| | | | |
| 24 | MECHANICAL STRENGTH | | P |
| | Connectors, surface mounting boxes and screwed glands have adequate mechanical strength | | P |
| 24.1 | Fixed socket-outlets, portable multiple socket-outlets and surface mounting boxes: impact test (apparatus shown in fig. 22, 23, 24 and 25) | | N/A |
| | After the test: no damage, live parts no become accessible | | N/A |
| 24.2 | Portable single socket-outlets and plugs: tumbling barrel test; number of falls .....: | 1000 | P |
| | Terminal screws or nuts tightened with a torque equal to 2/3 of that specified in 12.2.8 (Nm) .....: | | ¾ |
| | After the test: | | P |
| | No part become detached or loosened; | | P |
| | Pins no become so deformed that the plug cannot be introduced into a socket-outlet and also fails to comply with the requirements of 9.1 and 10.3; | | P |
| | Pins no turn when a torque of 0,4 Nm is applied for 1 min in each direction | | P |
| | Socket-outlets with shutters shall be tested again with the shutter test in Clause 21 | | N/A |
| 24.3 | VOID | | N/A |
| 24.4 | Portable single socket-outlets, multiple socket-outlets and plugs (elastomeric or thermoplastic material): impact test, weight 1000 g, height 100 mm (apparatus shown in fig. 21) | | N/A |
| | Specimens placed in a refrigerator at –15 °C ± 2 °C for at least 16 h | | N/A |
| | After the test: no damage | | N/A |
| 24.5 | Portable single socket-outlets and plugs (elastomeric or thermoplastic material): compression test, 300 N for 1 min, position a) and b) (apparatus shown in fig. 22) | | P |



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| VDE0620-2-1 and VDE0620-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |

| | | | |
|---|---|---|---|
| | After the test: no damage | | P |
| 24.6 | VOID | | N/A |
| 24.7 | Plug pins provided with insulating sleeves: 20000 movements, 4 N (apparatus shown in fig. 23) | Without insulating sleeves | N/A |
| | After the test: no damage of pins, insulating sleeve not have punctured or rucked up | | N/A |
| 24.8 | Shuttered socket-outlets: mechanical test carried out on specimens submitted to the normal operation test according to clause 21 | | N/A |
| | Force applied for 1 min against the shutter of an entry hole by means of one pin .....: | 40 N / 75 N | ¾ |
| | Pin not come in contact with live parts | | N/A |
| | After the test: no damage | | N/A |
| 24.9 | Multiple portable socket-outlet: mechanical test | | N/A |
| | Rewirable multiple socket-outlets: flexible cable of the smallest cross-sectional area specified in table 3 .....: | non-rewirable | ¾ |
| | 8 falls on concrete floor with the specimens arranged as shown in figure 24 | | N/A |
| | After the test: no damage, no part have become detached or loosened | | N/A |
| | Connectors other than ordinary submitted again to the test as specified in 16.2 | | N/A |
| | Socket-outlets with shutters shall be tested again with the shutter test in Clause 21 | | N/A |
| 24.10 | Plugs: pull test to verify the fixation of pins in the body of the plug (new specimens) | | P |
| | Maximum withdrawal force (table 16) applied for 1 min on each pin in turn, after the specimen has been placed at 70 °C for 1 h .....: | | ¾ |
| | After the test: displacement of pins in the body of the plug £ 1 mm .....: | | P |
| 24.11 | Barriers of portable socket-outlets having means for suspension on a wall: | | N/A |
| | Force applied for 10 s against the barrier by means of a cylindrical steel rod (1,5 times the maximum plug withdrawal force specified in table 16) (N) .....: | | ¾ |
| | Rod not pierce the barrier | | N/A |
| 24.12 | Portable socket-outlets having means for suspension on a wall (pull test): | | N/A |



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

| | | | |
|---|---|---|---|
| | Pull applied to the supply flexible cable for 10 s (force prescribed in 23.2 for checking the flexible cable anchorage) (N) .....: | | ¾ |
| | During the test: no break of the means for suspension on a wall | | N/A |
| 24.13 | Portable socket-outlets having means for suspension on a wall (pull test): | | N/A |
| | Pull applied to the engagement face of the socket-outlet for 10 s (maximum withdrawal force specified, for the corresponding plug, in table 16) (N) .....: | | ¾ |
| | During the test: no break of the means for suspension on a wall | | N/A |
| 24.14 | VOID | | ¾ |
| 24.15 | VOID | | ¾ |
| 24.16 | VOID | | ¾ |
| 24.17 | VOID | | ¾ |
| 24.18 | VOID | | ¾ |
| 24.19 | **on socket-outlets with shroud**<br>The shroud of a socket-outlet is subjected to a compression test at an ambient temperature of 25 °C ± 5°C with the fixture shown in Figure 37b<br>The force applied by flanges is 20N +/- 2N<br>After 1 min and still under force the dimensions still have to be in line with the standard sheets.<br>The test will be repeated after a 90° rotation. | | N/A |
| 24.20 | **on socket-outlets with hinged lid**<br>**In order to secure a degree of protection greater or equal to IP 44 for socket-outlets with hinged lids the hinged lid is subjected to a motion test.**<br><br>**After successful assembly, same as for intended use, the hinged lid is opened 5,000 times to a minimum of 5° before contact point. Any springs that may be present or other devices to close the lid may not get lost or rendered useless.** | | N/A |



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| VDE0620-2-1 and VDE0620-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| 24.21 | For socket-outlets with hinged lid, and to test the captivity of the lid, the hinged lid is subjected to a tensile test for 30 sec. in the most unfavorable direction, without jerking, using a force of 50 N. The lid may not loosen and/or break away. | | N/A |
| | | | |
| 25 | RESISTANCE TO HEAT | | P |
| 25.1 | Fixed and portable Connectors: heating cabinet 100 °C for 1 h | | P |
| | During the test: no change impairing their further use and sealing compound, if any, not flow | | P |
| | After the test: markings still legible | | P |
| 25.2 | Parts of insulating material of fixed socket-outlets necessary to retain current-carrying parts and parts of the earthing circuit in position, and parts of the front surface zone of 2 mm width surrounding the phase and neutral pin entry holes: ball-pressure test (1 h, 125 °C) | | P |
| | After the test: diameter of impression £ 2 mm .....: | 0.3 | P |
| 25.3 | For parts not necessary to retain current-carrying parts and parts of the earthing circuit in position, even though in contact with them: ball-pressure test (1 h) | | N/A |
| | Test temperature (°C) .....: | | N/A |
| | After the test: diameter of impression £ 2 mm .....: | | N/A |
| 25.4 | Portable Connectors: compression test (20 N, 1 h, 80 °C) by means of the apparatus shown in figure 28 | | P |
| | After the test: no damage | | P |
| | | | |
| 26 | SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS | | P |
| 26.1 | Connections withstand mechanical stresses | | P |
| | Thread-forming or thread-cutting screws used only if supplied together with the piece in which they are intended to be inserted | | N/A |
| | Thread-cutting screws intended to be used during installation: captive | | N/A |
| | Screws and nuts which transmit contact pressure: in engagement with a metal thread | | N/A |
| | Test: | | N/A |
| | - 10 times for screws in engagement with a thread of insulating material and for screws of insulating material | | N/A |
| | - 5 times for all other cases | | N/A |



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| VDE0620-2-1 and VDE0620-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - terminals: screw diameter (mm); torque (Nm); times .....: | | ¾ |
| | - earthing terminals: screw diameter (mm); torque (Nm); times .....: | | ¾ |
| | - assembly screws: screw diameter (mm); torque (Nm); times .....: | | ¾ |
| | - cord anchorage: screw diameter (mm); torque (Nm); times .....: | | ¾ |
| | - other screws or nuts: diameter (mm); torque (Nm); times .....: | | ¾ |
| | During the test: no damage impairing the further use of the screwed connectons | | N/A |
| 26.2 | Screws in engagement with a thread of insulating material: correct introduction into the screw hole or nut ensured | | N/A |
| 26.3 | Contact pressure: not transmitted through insulating material other than ceramic, pure mica or other material no less suitable unless there is sufficient resiliency in metallic parts | | P |
| | Connections made by insulation piercing of tinsel cord reliable | | N/A |
| 26.4 | Screws and rivets locked against loosening and/or turning | | N/A |
| 26.5 | Current-carrying parts of metal having mechanical strength, electrical conductivity and resistance to corrosion adequate: | | P |
| | - copper; | | N/A |
| | - alloy with at least 58 % copper for parts made from cold-rolled sheet or with at least 50 % copper for other parts; | | P |
| | - stainless steel with at least 13 % chromium and not more than 0,09 % carbon | | N/A |
| | - steel with electroplated coating of zinc (ISO 2081), with thickness of at least: | | N/A |
| | 5 µm, service condition ISO no. 1, for ordinary equipment | | N/A |
| | 12 µm, service condition ISO no. 2, for splash-proof equipment | | N/A |
| | 25 µm, service condition ISO no. 3, for jet-proof equipment | | N/A |
| | - steel with electroplated coating of nickel and chromium (ISO 1456), with thickness of at least: | | N/A |



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| VDE0620-2-1 and VDE0620-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | 20 µm, service condition ISO no. 2, for ordinary equipment | | N/A |
| | 30 µm, service condition ISO no. 3, for splash-proof equipment | | N/A |
| | 40 µm, service condition ISO no. 4, for jet-proof equipment | | N/A |
| | - steel with electroplated coating of tin (ISO 2093), with thickness of at least: | | N/A |
| | 12 µm, service condition ISO no. 2, for ordinary equipment | | N/A |
| | 20 µm, service condition ISO no. 3, for splash-proof equipment | | N/A |
| | 30 µm, service condition ISO no. 4, for jet-proof equipment | | N/A |
| | Current-carrying parts subjected to mechanical wear: not of steel with electroplated coating | | N/A |
| | Metals having a great difference of electrochemical potential: not used in contact with each other | | N/A |
| 26.6 | Contacts subjected to a sliding action: of metal resistant to corrosion | | N/A |
| 26.7 | Thread-forming screws and thread-cutting screws not used for the connection of current-carrying parts | | N/A |
| | Thread-forming screws and thread-cutting screws used to provide earthing connection: not necessary to disturb the connection and at least two screws are used for each connection | | N/A |
| | | | |
| 27 | CREEPAGE DISTANCES, CLEARANCES AND DISTANCES THROUGH SEALING COMPOUND | | P |
| 27.1 | Creepage distances, clearances and distances through sealing compound no less than the values shown in table 23 | | P |
| | Creepage distances (cr): | | P |
| | 1) between live parts of different polarity ³ 3 mm ..: | >5.0mm | P |
| | 2) between live parts and: | | P |
| | - accessible insulating and earthed metal parts ³ 3 mm .....: | >6.5mm | P |
| | - parts of earthing circuit ³ 3 mm .....: | | N/A |



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| VDE0620-2-1 and VDE0620-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | - metal frames supporting the base of flush-type socket-outlets ³ 3 mm .....: | | N/A |
| | - screws or devices for fixing bases, covers or cover-plates of fixed socket-outlets ³ 3 mm .....: | | N/A |
| | - external assembly screws, other than screws which are on the engagement face of plugs and are isolated from the earthing circuit ³ 3 mm .....: | | N/A |
| | 3) between pins of plugs and metal parts connected to them, when fully engaged, and a socket-outlet of the same system having accessible unearthed metal parts ³ 6(4,5) mm .....: | | N/A |
| | 4) between the accessible unearthed metal parts of a socket-outlet and a fully engaged plug of the same system having pins and metal parts connected to them ³ 6(4,5) mm .....: | | N/A |
| | 5) between live parts of a socket-outlet (without a plug) and its accessible unearthed metal parts ³ 6(4,5) mm .....: | | N/A |
| | Clearances (cl): | | P |
| | 6) between live parts of different polarity ³ 3 mm ..: | >5.0mm | P |
| | 7) between live parts and: | | P |
| | - accessible insulating and earthed metal parts not mentioned under 8 and 9 ³ 3 mm .....: | >6.5mm | P |
| | - parts of earthing circuit ³ 3 mm .....: | | N/A |
| | - metal frames supporting the base of flush-type socket-outlets ³ 3 mm .....: | | N/A |
| | - screws or devices for fixing bases, covers or cover-plates of fixed socket-outlets ³ 3 mm .....: | | N/A |
| | - external assembly screws, other than screws which are on the engagement face of plugs and are isolated from the earthing circuit ³ 3 mm .....: | | N/A |
| | 8) between live parts and: | | N/A |
| | - exclusively earthed metal boxes ³ 3 mm .....: | | N/A |
| | - unearthed metal boxes, without insulating lining ³ 4,5 mm .....: | | N/A |
| | 9) between live parts and the surfaces on which the base of a socket-outlet for surface mounting is mounted ³ 6 mm.....: | | N/A |



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| VDE0620-2-1 and VDE0620-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | 10) between live parts and the bottom of any conductor recess, if any, in the base of a socket-outlet for surface mounting ³ 3 mm.....: | | N/A |
| | Distance through insulating sealing compound: | | N/A |
| | 11) between live parts covered with at least 2 mm of sealing compound and the surfaces on which the base of a socket-outlet for surface mounting is mounted ³ 4(3) mm .....: | | N/A |
| | 12) between live parts covered with at least 2 mm of sealing compound and the bottom of any conductor recess, if any, in the base of a socket-outlet for surface mounting ³ 2,5 mm.....: | | N/A |
| 27.2 | Insulating sealing compound: not protrude above the edge of the cavity in which it is contained | | N/A |
| 27.3 | Ordinary surface-type socket-outlets: no bare current-carrying strips at the back | | N/A |
| | | | |
| 28 | RESISTANCE OF INSULATING MATERIAL TO ABNORMAL HEAT, TO FIRE AND TO TRACKING | | P |
| 28.1 | Resistance to abnormal heat and to fire | | P |
| 28.1.1 | Glow-wire test | | P |
| | For parts of fixed Connectors necessary to retain current-carrying parts and parts of the earthing circuit in position: test temperature 850 °C<br>Note 5: The outer material by moulded plugs is totally removed when testing the supporting parts | | N/A |
| | No visible flame and no sustained glowing | | N/A |
| | Flame and glowing extinguish within 30 s .....: | | N/A |
| | No ignition of the tissue paper | | N/A |
| | For parts of fixed Connectors needed to retain the earth terminal in position in a box: test temperature 650 °C | | N/A |
| | No visible flame and no sustained glowing | | N/A |
| | Flame and glowing extinguish within 30 s .....: | | N/A |
| | No ignition of the tissue paper | | N/A |
| | For parts of portable Connectors necessary to retain current-carrying parts and parts of the earthing circuit in position: test temperature 750 °C | | P |
| | No visible flame and no sustained glowing | | P |
| | Flame and glowing extinguish within 30 s .....: | | N/A |
| | No ignition of the tissue paper | | P |



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| VDE0620-2-1 and VDE0620-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | For parts not necessary to retain current-carrying parts and parts of the earthing circuit in position, even though in contact with them: test temperature 650 °C | | N/A |
| | No visible flame and no sustained glowing | | N/A |
| | Flame and glowing extinguish within 30 s .....: | | N/A |
| | No ignition of the tissue paper | | N/A |
| 28.1.2 | Plugs with pins provided with insulating sleeves: | | N/A |
| | Test temperature maintained for 3 h by means of the apparatus shown in figure 26 .....: | 120 °C / 180 °C | ¾ |
| | Impact test according to sub-clause 30.4 (mass 100 g, height 100 mm, 4 impacts): no cracks of the insulating sleeves | | N/A |
| 28.2 | Resistance to tracking | | N/A |
| | Parts of insulating material retaining live parts in position of Connectors other than ordinary: test voltage 175 V, 50 drops, solution A of IEC 112 | | N/A |
| | No flashover or breakdown | | N/A |
| | | | |
| 29 | RESISTANCE TO RUSTING | | N/A |
| | Ferrous parts protected against rusting | | N/A |
| | No signs of rust after 10 min in carbon tetrachloride, trichloroethane or equivalent degreasing agent, 10 min 10 % solution of ammonium chloride, 10 min in a box with air saturated with moisture and 10 min at 100 °C | | N/A |
| | | | |
| 30 | ADDITIONAL TESTS ON PINS PROVIDED WITH INSULATING SLEEVES | | N/A |
| 30.1 | Pressure test at high temperature | | N/A |
| | Apparatus shown in figure 29, with the test specimen in position, maintained for 2 h at 200 °C. Force applied through the blade: 2,5 N | | N/A |
| | Thickness of insulation measured: before the test (mm); after the test (mm) .....: | | ¾ |
| | Thickness within the area of impression ³ 50 % of the thickness measured before the test: percent value (%) .....: | | N/A |
| 30.2 | Static damp heat test | | N/A |
| | Set of 3 specimens submitted to two damp heat cycles in accordance with IEC 68-2-30 | | N/A |



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## Attachment No.4

| VDE0620-2-1 and VDE0620-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | After the test: | | N/A |
| | Insulation resistance and electric strength test (clause 17) | | N/A |
| | Abrasion test (sub-clause 24.7) | | N/A |
| 30.3 | Test at low temperature | | N/A |
| | Set of 3 specimens maintained at –15 °C ± 2 °C for 24 h | | N/A |
| | After the test: | | N/A |
| | Insulation resistance and electric strength test (clause 17) | | N/A |
| | Abrasion test (sub-clause 24.7) | | N/A |
| 30.4 | Impact test at low temperature | | N/A |
| | Specimens maintained at –15 °C ± 2 °C for 24 h subjected to 4 impacts (mass 100 g, height 100 mm) by means of the apparatus shown in figure 30 rotating the specimen through 90° between impacts | | N/A |
| | After the test: no crack of the insulating sleeves | | N/A |
| 31 | EMC | | N/A |
| | No requirements except when the accessories contain electronic parts<br>Neon lamps are not electronic parts. | | N/A |
| | Accessories with electronic parts must comply with the relevant EMC requirements | | N/A |



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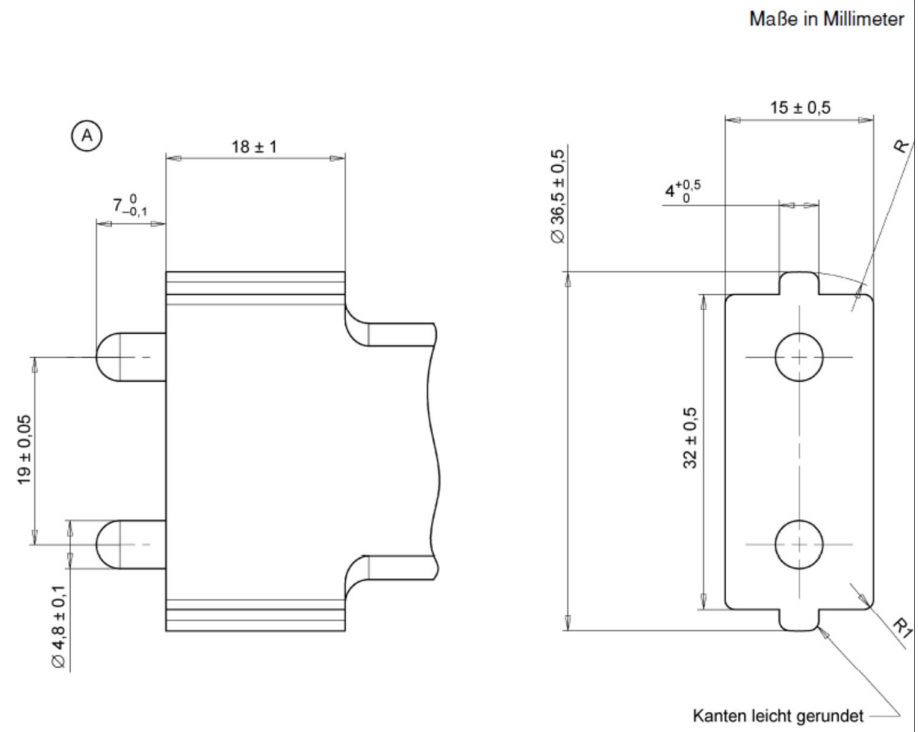
## Attachment No.4

| VDE0620-2-1 and VDE0620-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | New testing instruments:<br>Gauge 19a and 19b | | N/A |
| |  <br>Aversal Sollte mit dieser Lehre der Shutter nicht vollständig geöffnet werden können, kann das Maß a bi auf $9_{-0,1}$ erweitert werden.<br>*Die Lehre ist beweglich und muss sich durch ihr Eigengewicht vollständig einführen lassen.*<br>**Lehre 19a – Lehre für die Messung der Kraft zum Öffnen des Shutters für Steckdosen 16 A, 250 V~ nach DIN 49440-1 (siehe 10.5 und 21)** | | - |
| | Sizes in millimeter Edges slightly rounded<br>Aversal If the shutter cannot be fully opened with this gauge then size a can be expanded to $9_{-0.1}$.<br>*The gauge is movable and its own weight should make it possible to be inserted completely.* | | N/A |



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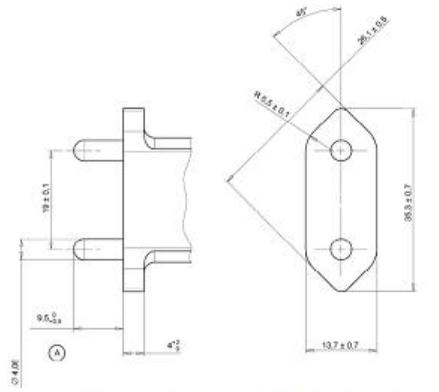
## Attachment No.4

| VDE0620-2-1 and VDE0620-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | | | N/A |
| | | | N/A |

DIN VDE 0620-1 (VDE 0620-1):2010-02

Maße in Millimeter



Aversal Sollte mit dieser Lehre der Shutter nicht vollständig geöffnet werden können, kann das Maß a bis auf 11,5 $_{-0,1}$ erweitert werden.

*Die Lehre ist beweglich und muss sich durch ihr Eigengewicht vollständig einführen lassen.*

**Lehre 19b – Lehre für die Messung der Kraft zum Öffnen des Shutters für Steckdosen 2,5 A, 250 V~ nach DIN 49440-2 und DIN 49437 (siehe 10.5 und 21)**

Sizes in millimeter

Aversal If the shutter cannot be fully opened with this gauge then size a can be expanded to 11.5 $_{-0.1}$.

*The gauge is movable and its own weight should make it possible to be inserted completely.*

**Gauge 19b - gauge for measuring the force to open the shutter for socket-outlets 2.5 amps, 250 VDC per DIN 49440-2 and DIN 49437 (see 10.5 and 21).**



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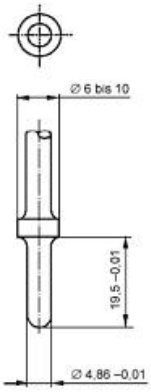
## Attachment No.4

| VDE0620-2-1 and VDE0620-1 | | | |
|---|---|---|---|
| Clause | Requirement + Test | Result - Remark | Verdict |
| | **Gauge 16e**<br>DIN VDE 0620-1 (VDE 0620-1):2010-02<br>Maße in Millimeter<br>  <br><br>Lehre 16e – Lehre zur Prüfung der größten Abzugskraft der Kontaktbuchse des Steckers nach DIN 49441 Form R2 (siehe 22.1.2)<br>Sizes in millimeter<br>Gauge 16e - gauge to test the greatest withdrawal force of the plug's jack per DIN 49441 form R2 (see 22.1.2) | | |



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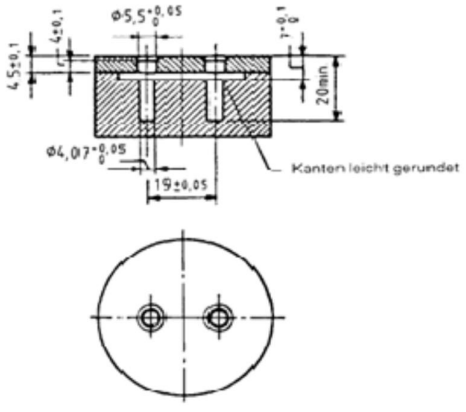
## Attachment No.5

# ATTACHMENT TO TEST REPORT

## Applicable for all standards applied for testing of plug-in power supplies
## Germany NATIONAL DIFFERENCES
## GS Scheme

| | |
|---|---|
| **Differences according to**..... : | all standards applied for testing of plug-in power supplies e.g. EN 60065, EN 60335, EN 60601, EN 60950-1, EN 61010, EN 61558, EN 60598, EN 61029, EN 60745, VDE 0620 |
| **Attachment Form No**..... : | Germany_ND_GS_Scheme_EK1 557-13 |
| **Attachment Originator**..... : | TÜV SÜD Product Service GmbH |
| **Master Attachment**..... : | Date 2013-07 |

| Clause | Requirement + Test | Result - Remark | Verdict |
|---|---|---|---|
| | **Special national conditions**<br>**Germany GS Scheme according EK1 557-13** | | |
| | The moulded plug of plug-in power supplies will be considered as component and will be generally evaluated in Germany according to DIN VDE 0620-1:2010 respectively DIN VDE 0620-1:2013 and DIN VDE 0620-2-1:2013. After the test according to DIN VDE 0620-2-1:2013, sub-clause 24.2, the plug be shall still pass the test according to DIN VDE 0620-101:1992 clause 7, figure 2 “Gauge for interchangeability” It should be possible to insert the plug without applying an excessive force such that the end surface touches the surface of the gauge<br>  | Remark:<br>The complete plug-in power supply is considered as a “plug” and has to be tested in the tumbling barrel. | P |



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# Attachment No.6

Material list for PAH risk assessment according to **AfPS GS 2014:01 PAK**

| Material No. | Location / Function of the material | Supplier/ manufacture name | Type/ Model No. of the material | Category | Smell | Rigidity | Colour | Chem. test needed? | Evaluation result | Evidence attachment technical report No. |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Enclosure of LED driver | N/A | Plastic | ☐ 1<br>☐ 2<br>☒ 3 | ☐ Yes<br>☒ No | ☐ Soft<br>☐ Flexible<br>☒ Rigid | ☒ Black or dark-colour<br>☐ White or light-colour<br>☐ …… | ☒ No<br>☐ Yes | ☒ PASS<br>☐ Fail | 64.164.15.04464.01 |



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**Photo Documentation**

Details of: General view, all models have same construction

View:

[ ] general

[ ] front

[ ] rear

[ ] right

[ ] left

[ ] top

[ ] bottom

Details of: DE plug

View:

[ ] general

[ ] front

[ ] rear

[ ] right

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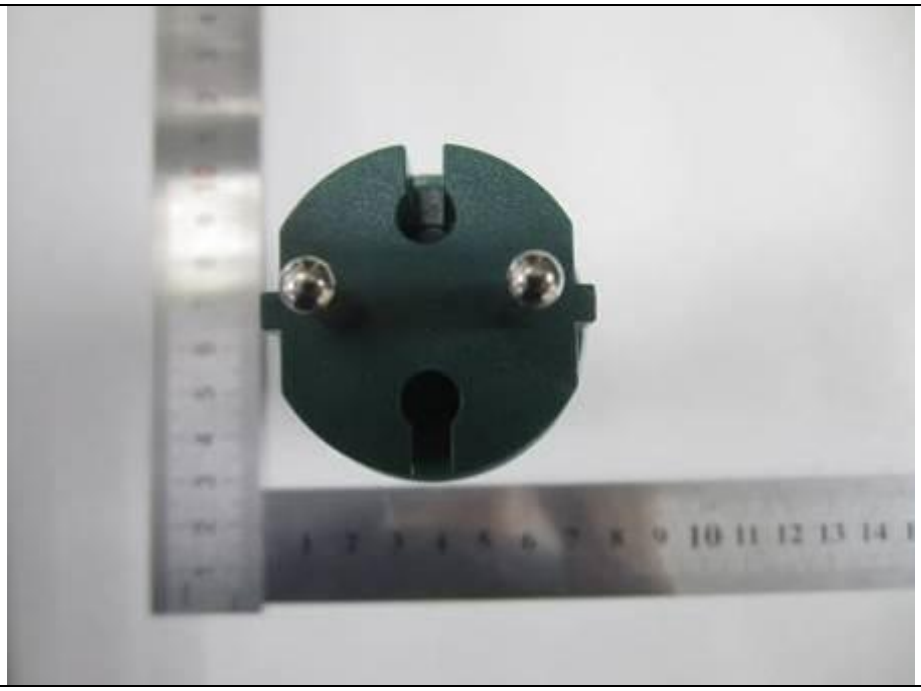
[ ] top

[ ] bottom





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Details of: DE plug

View:

[ ] general

[ ] front

[ ] rear

[ ] right

[ ] left

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[ ] bottom

Details of: Output view

View:

[ ] general

[ ] front

[ ] rear

[ ] right

[ ] left

[ ] top

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Details of: Details view for output, there are three kinds of output connector for each model

View:

[ ] general

[ ] front

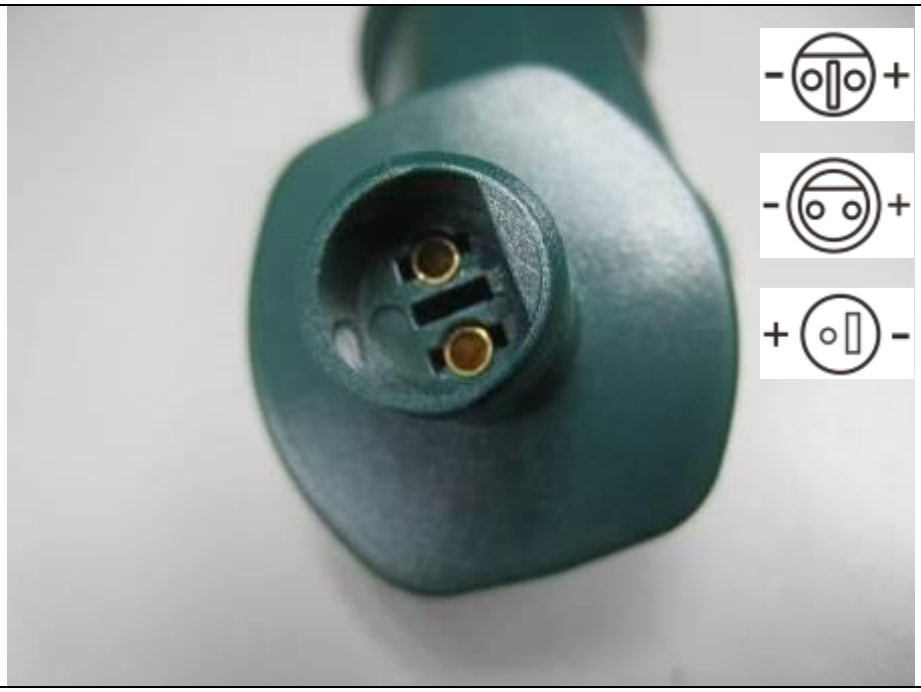
[ ] rear

[ ] right

[ ] left

[ ] top

[ ] bottom




Details of: Internal view. Ultrasonic sealing for the cover

View:

[ ] general

[ ] front

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Details of: Overall view

View:

[ ] general

[ ] front

[ ] rear

[ ] right

[ ] left

[ ] top

[ ] bottom

Details of: Internal view

View:

[ ] general

[ ] front

[ ] rear

[ ] right

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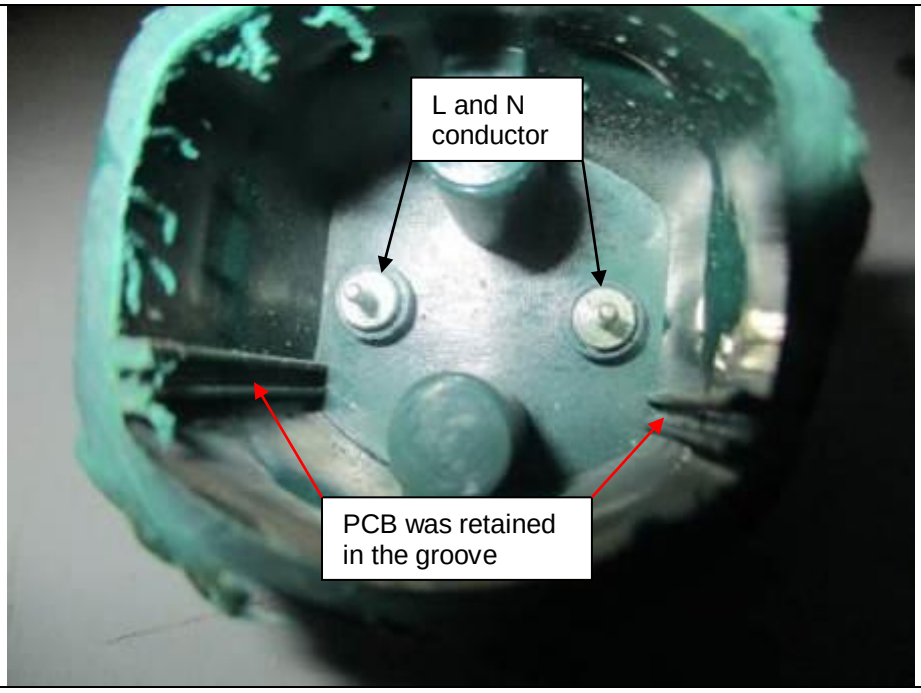
[ ] top

[ ] bottom



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Details of: Output connection after removed the silicon

View:

[ ] general

[ ] front

[ ] rear

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[ ] left

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[ ] bottom

Details of: Top view of PCB for 4W series models

View:

[ ] general

[ ] front

[ ] rear

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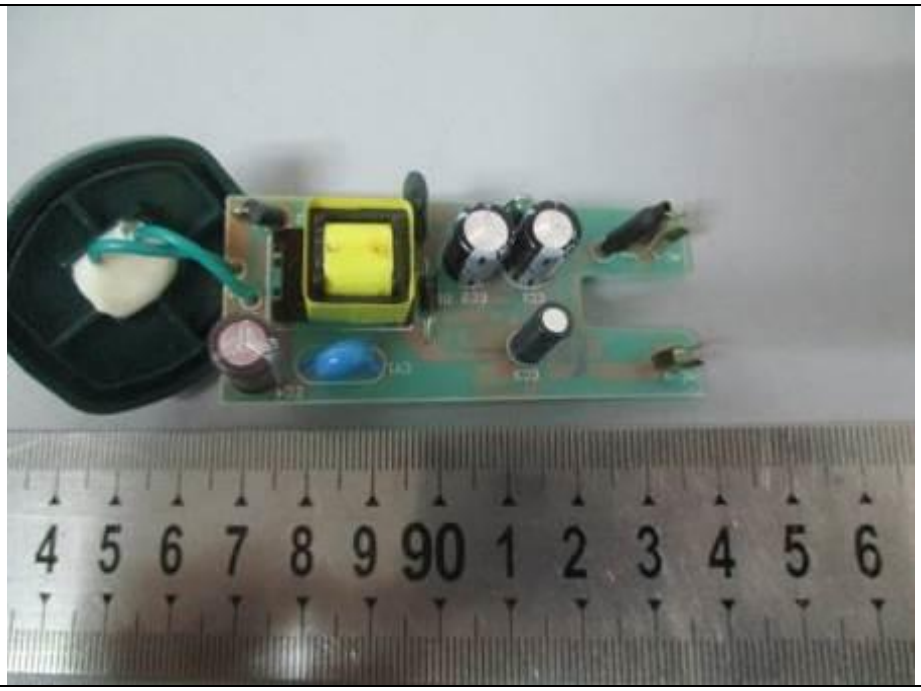
[ ] bottom



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Details of: Bottom view of PCB for 4W series models

View:

[ ] general

[ ] front

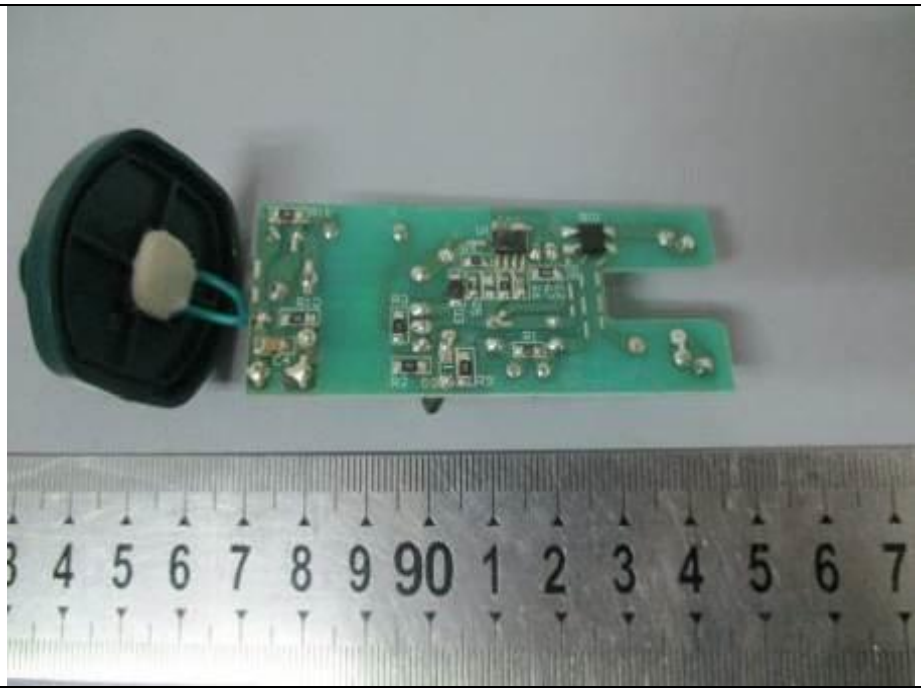
[ ] rear

[ ] right

[ ] left

[ ] top

[ ] bottom



Details of: Transformer for 4W series models, TJ-GS12V4W and TJ-GS30V4W are same except turns of winding

View:

[ ] general

[ ] front

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[ ] right

[ ] left

[ ] top

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Details of: Transformer for 4W series models. Primary winding: magnet wire

View:

[ ] general

[ ] front

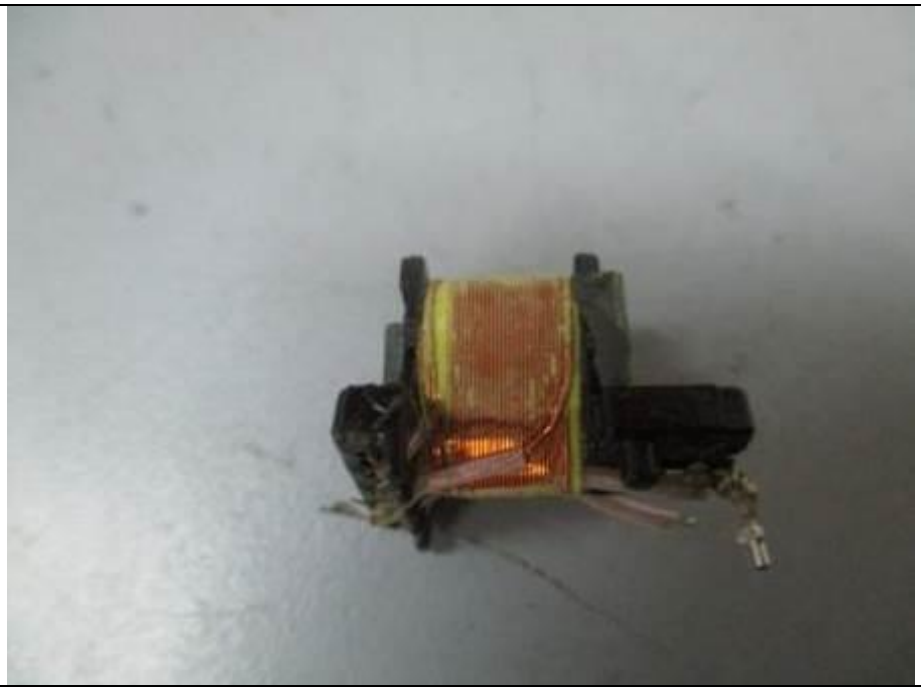
[ ] rear

[ ] right

[ ] left

[ ] top

[ ] bottom



Details of: Transformer for 4W series models. Secondary winding: triple insulated wire

View:

[ ] general

[ ] front

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Details of: Top view of PCB for 8W series models

View:

[ ] general

[ ] front

[ ] rear

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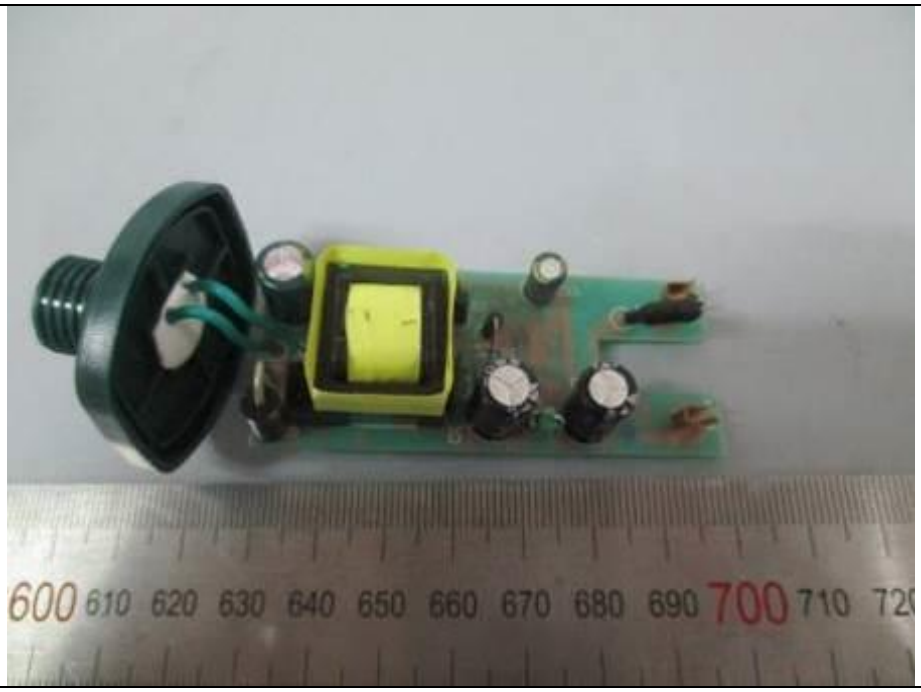


Details of: Bottom view of PCB for 8W series models

View:

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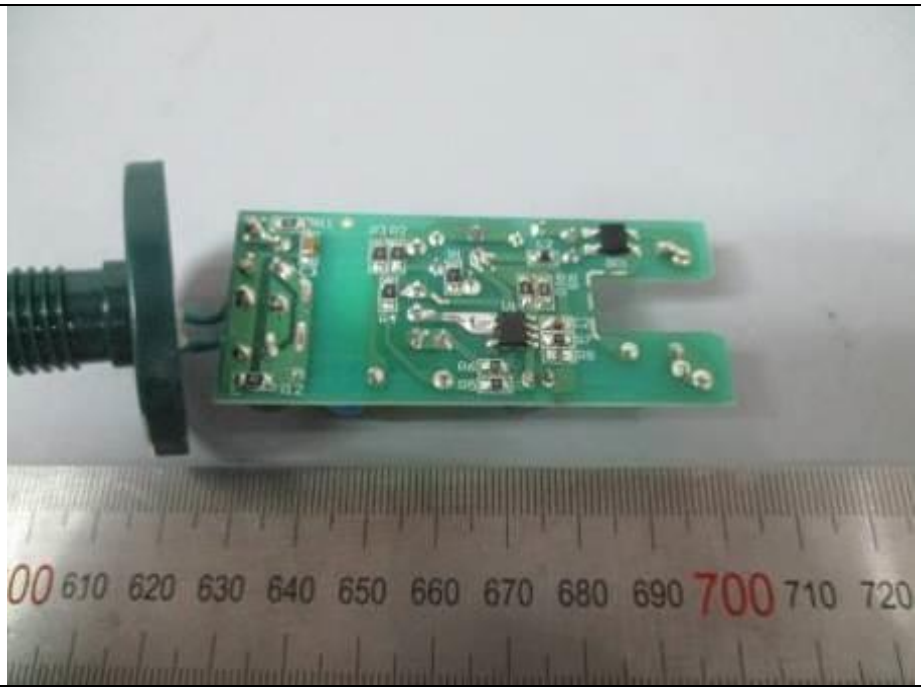




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Details of: Transformer for 8W series models, TJ-GS12V8W and TJ-GS30V8W are same except turns of winding

View:

[ ] general

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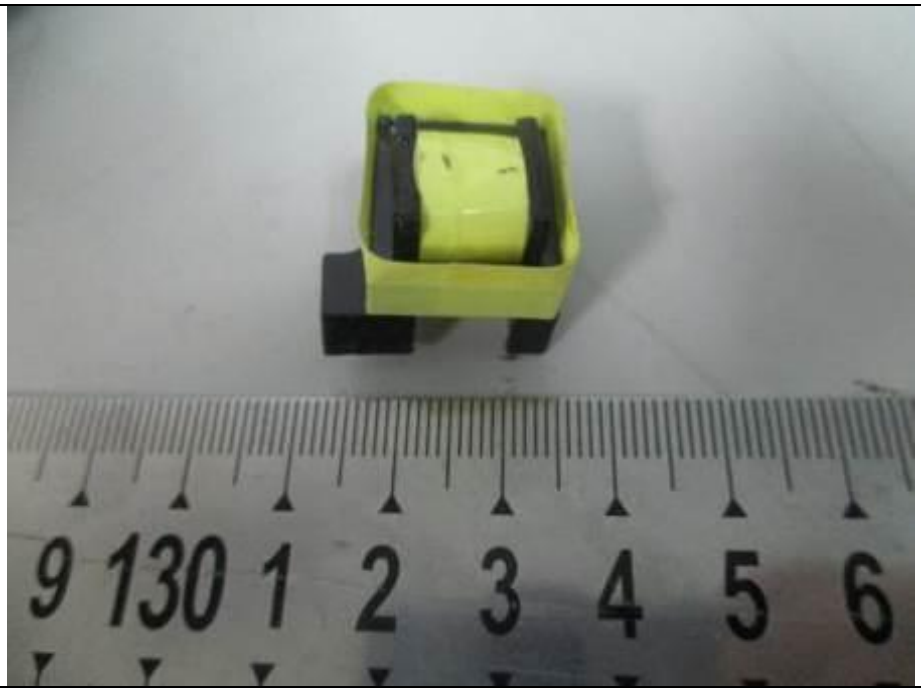


Details of: Transformer for 8W series models. Primary winding: magnet wire

View:

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Details of: Transformer for 8W series models. Secondary winding: triple insulated wire

View:

[ ] general

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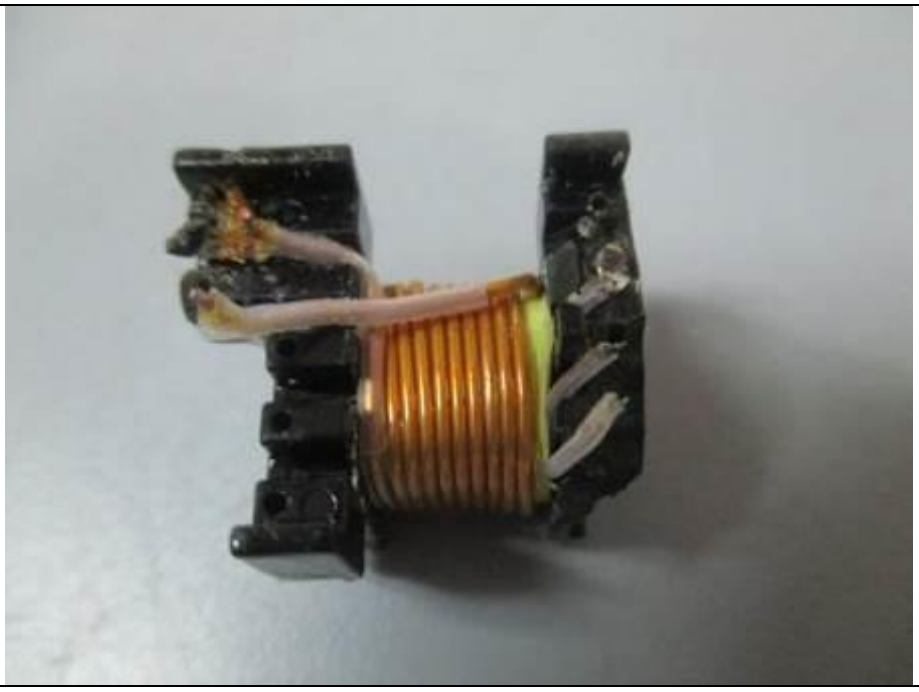

Details of: General view for 9-15W series models, all models have same construction

View:

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Details of: Top view of PCB for 9-15W series models

View:

[ ] general

[ ] front

[ ] rear

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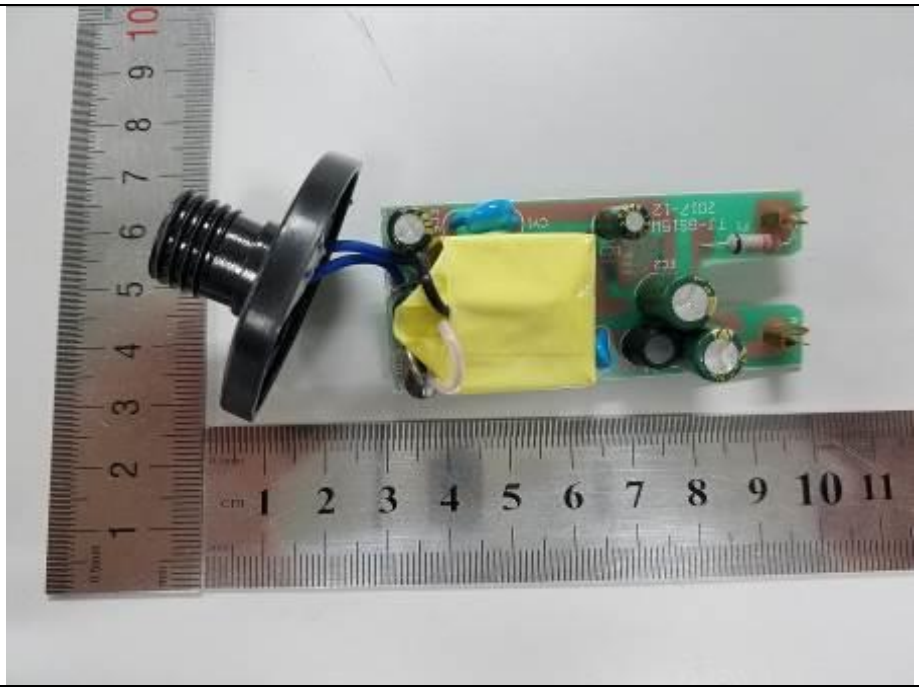
[ ] bottom



Details of: Bottom view of PCB for 9-15W series models

View:

[ ] general

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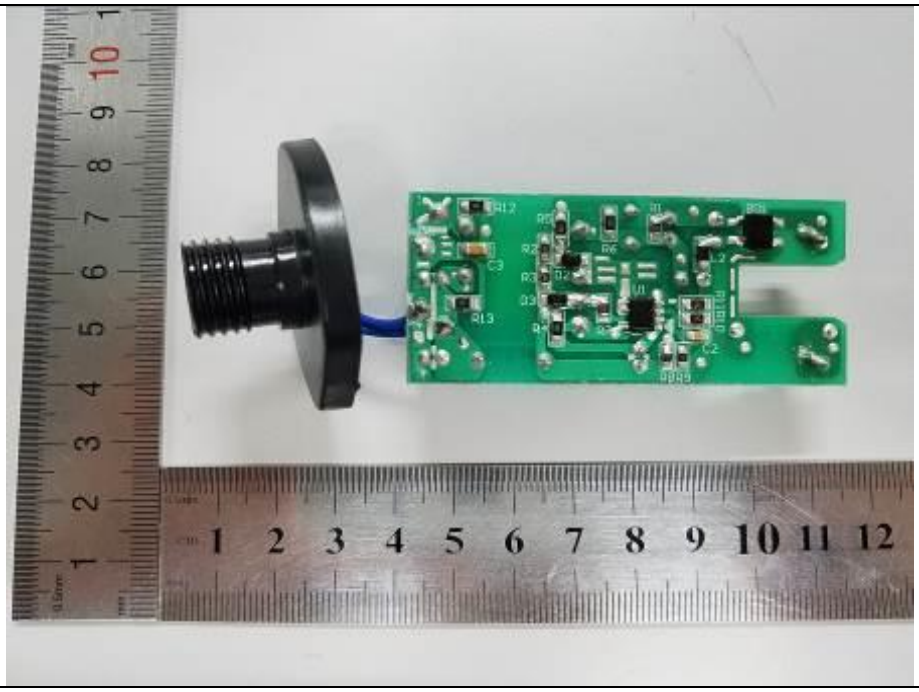



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Details of: Transformer for 9-15W series models, BS、GS12V15W and BS、GS24V15W are same except turns of winding

View:

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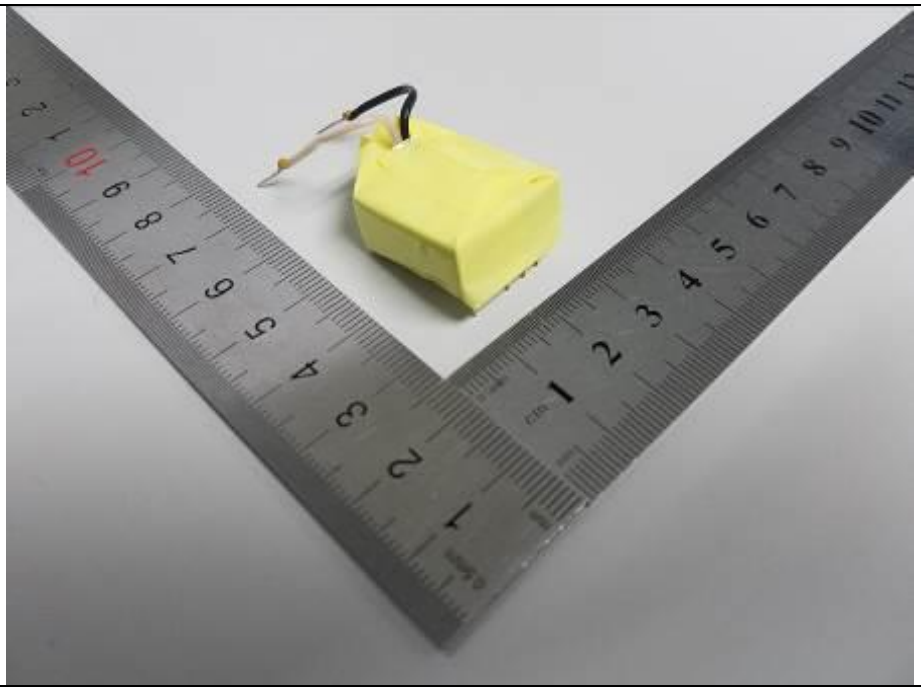

Details of: Transformer for 9-15W series models

View:

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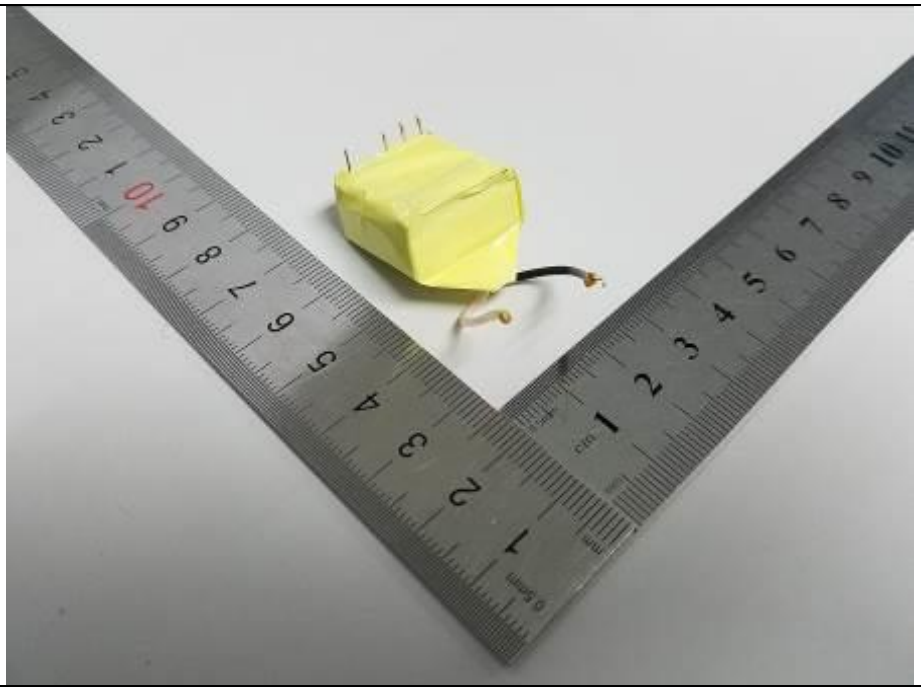



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Details of: Transformer for 9-15W series models

View:

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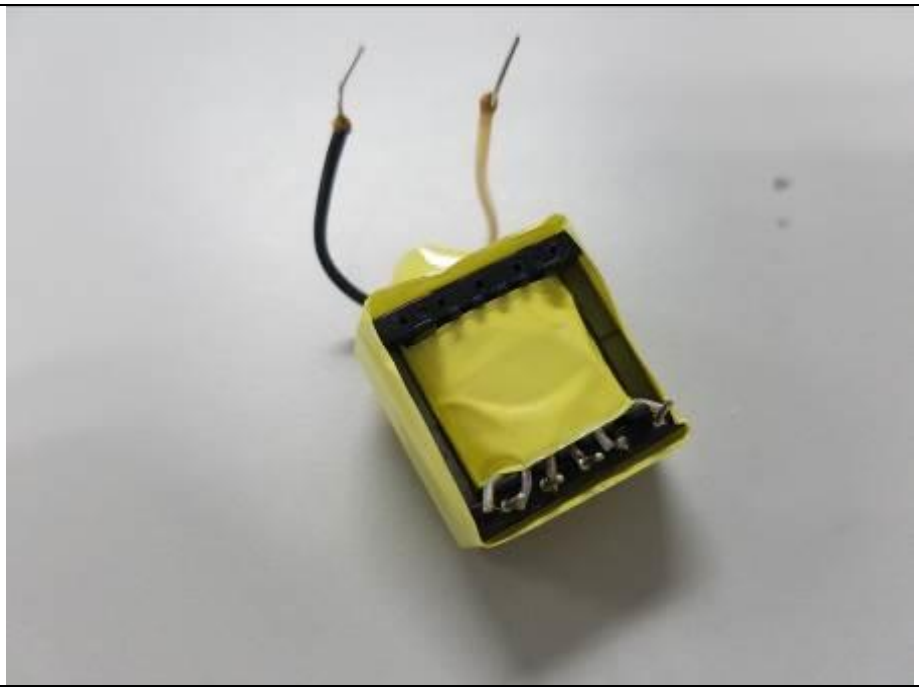

Details of: Transformer for 9-15W series models. Primary winding: magnet wire

View:

[ ] general

[ ] front

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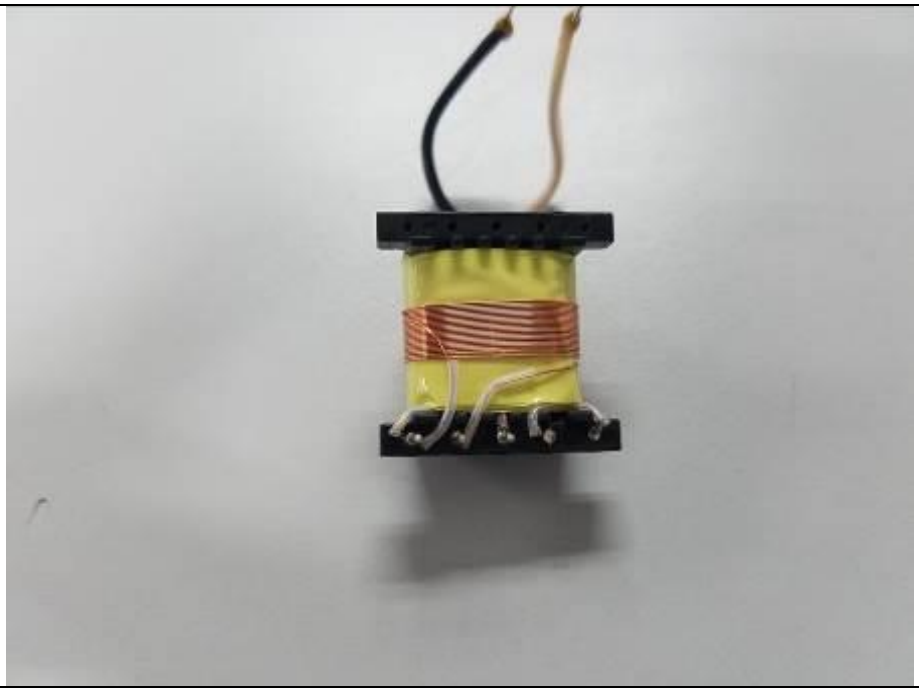



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Details of: Transformer for 9-15W series models. Primary winding: magnet wire

View:

[ ] general

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[ ] rear

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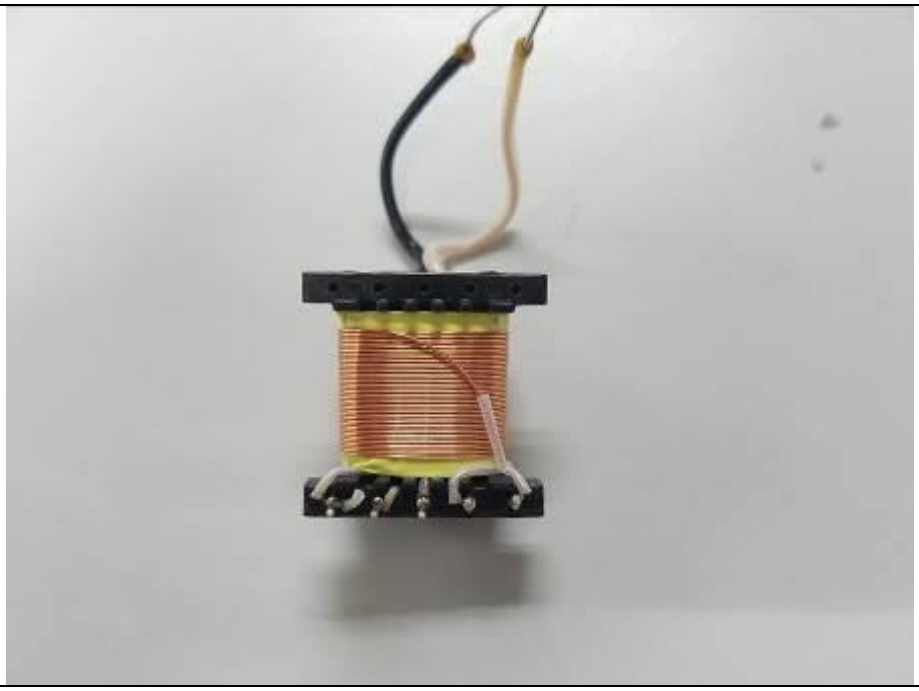
[ ] top

[ ] bottom



Details of: Transformer for 9-15W series models. Secondary winding: triple insulated wire

View:

[ ] general

[ ] front

[ ] rear

[ ] right

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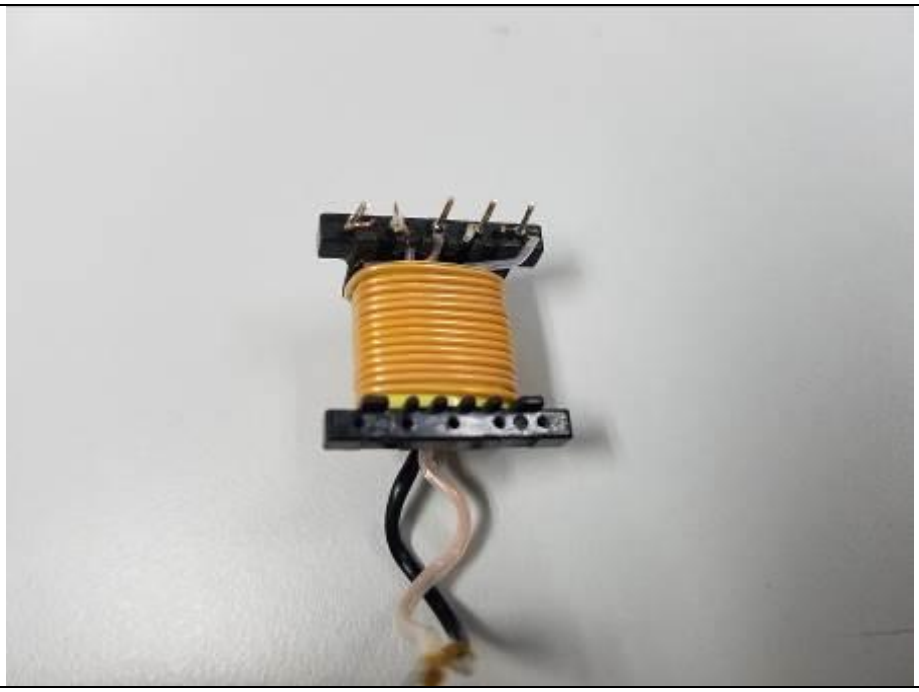
[ ] top

[ ] bottom





Telephone : +86 20 38320668
Telefax : +86 20 38320478
http://www.tuv-sud.cn

TÜV SÜD Certification and Testing (China) Co., Ltd.Guangzhou branch
5F, Communication Building, 163 Pingyun Rd, Huangpu Ave. West,
Guangzhou, 501656
P.R.China

Details of: Transformer for 9-15W series models. Secondary winding: triple insulated wire

View:

[ ] general

[ ] front

[ ] rear

[ ] right

[ ] left

[ ] top

[ ] bottom

Details of: Transformer for 9-15W series models. Primary winding: magnet wire

View:

[ ] general

[ ] front

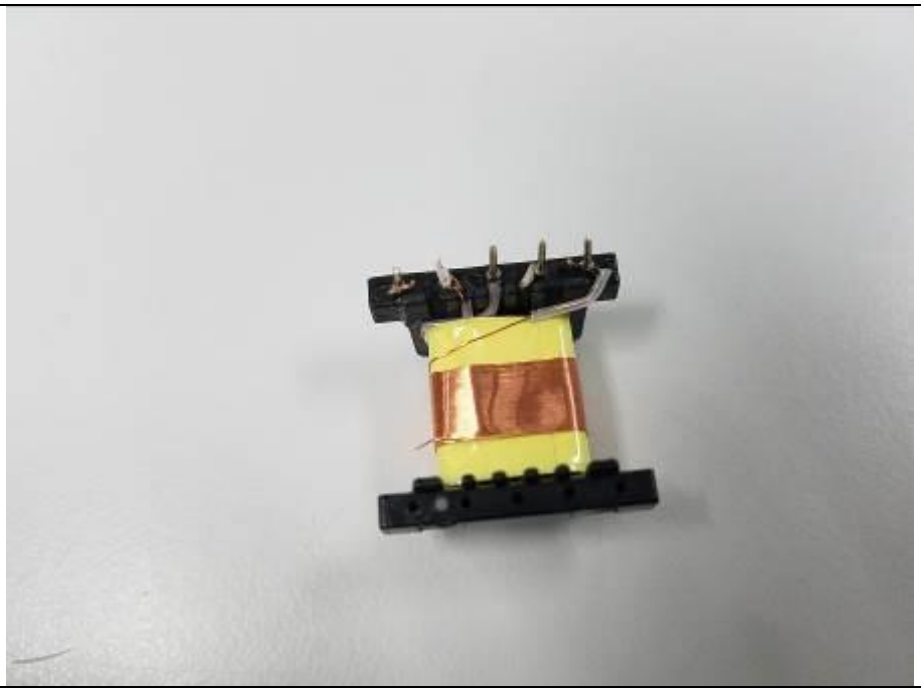
[ ] rear

[ ] right

[ ] left

[ ] top

[ ] bottom





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Guangzhou, 501656
P.R.China

Details of: Transformer for 9-15W series models. Primary winding: magnet wire

View:

[ ] general

[ ] front

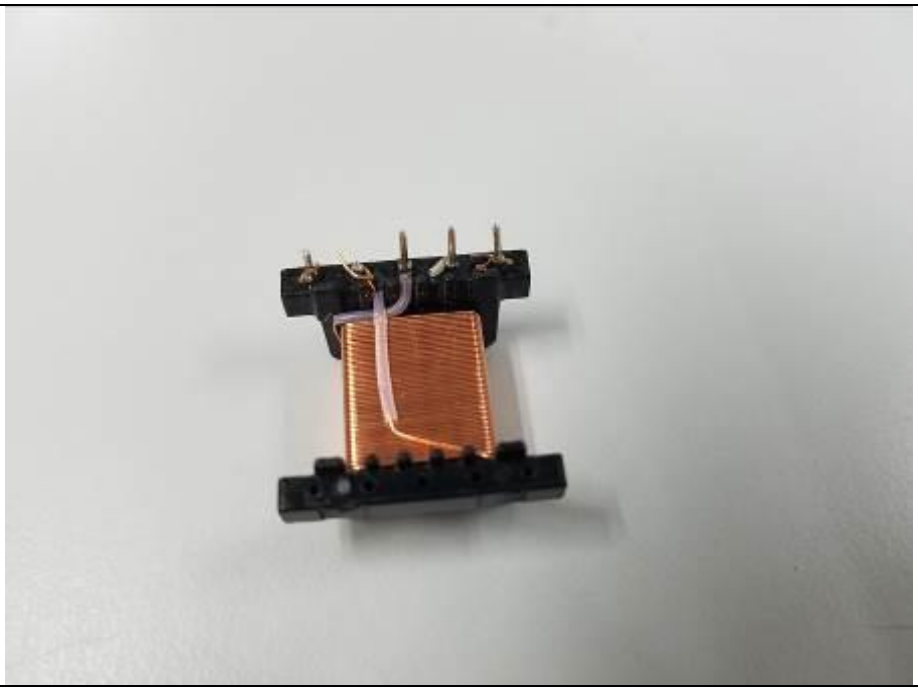
[ ] rear

[ ] right

[ ] left

[ ] top

[ ] bottom





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