

Certificate of Conformity

Certificate no.: P201401011

Applicant: Rutec Einkauf GmbH

Address: Carl-Zeiss-Str. 15, Postfach 1437, 28857 Syke, Germany

Product: LED Driver

Model no.: 85470, 85417, 85475, 85418, 85670, 85419, 85570, 85433, 85471, 85415, 85476, 85416, 85770, 85422, 85870, 85421, 85970, 85420

Parameter

Input rating:	100-240Vac, 50/60Hz
	1.0A max. for models: 85470, 85417, 85475, 85418, 85670, 85419, 85570, 85433
	1.4A max. for models: 85471, 85415, 85476, 85416, 85770, 85422, 85870, 85421, 85970, 85420
Output rating:	Refer to Appendix
Protection class	Class II
Ambient temperature	40°C

Test standard(s): EN 61347-2-13:2006 which used in conjunction with EN 61347-1:2008+A1:2011.

Test report no.: P201401011

Date: 2014-02-21

This EC-Certificate of Conformity is issued on a voluntary basis according to the Low Voltage Directive 2006/95/EC relating to electrical equipment design for use within certain voltage limits. It confirms that the listed equipment complies with the principal protection requirements of the Directive. It refers only to the particular sample submitted for testing and certificate.

Approved by:

Tina Chou
General Manager
i-Tek Electronics Consultant Corp.


Certificate no.: P201401011

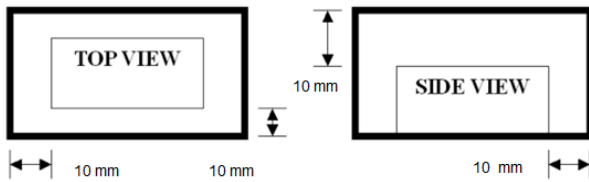
Appendix

Output rating:


Model#	DC output rating
85470	12Vdc, 3A
85417	12Vdc, 2.8A
85475	24Vdc, 1.5A
85418	24Vdc, 1.4A
85670	36Vdc, 1A
85419	36Vdc, 1.05A
85570	48Vdc, 0.75A
85433	48Vdc, 0.7A
85471	12Vdc, 5A
85415	12Vdc, 5A
85476	24Vdc, 2.5A
85416	24Vdc, 2.5A
85770	36Vdc, 1.67A
85422	36Vdc, 1.67A
85870	42Vdc, 1.4A
85421	42Vdc, 1.4A
85970	48Vdc, 1.25A
85420	48Vdc, 1.05A








<p>TEST REPORT IEC 61347-2-13 Part 2: Particular requirements: Section Thirteen – d.c. or a.c. supplied electronic controlgear for LED modules</p>	
<p>Report Number.....: P201401011</p> <p>Date of issue.....: 2014-02-21</p> <p>Total number of pages.....: 54</p> <p>Tested by (name + signature).....: Ethan Chiu</p> <p>Approved by (name + signature)....: Kent Fang</p>	
<p>Testing Laboratory.....: i-Tek Electronics Consultant Corp.</p> <p>Address.....: 3F., No. 904, Zhongzheng Rd., Zhonghe Dist., New Taipei City 23586, Taiwan (R.O.C.)</p>	
<p>Applicant' s name.....: Rutec Einkauf GmbH</p> <p>Address.....: Carl-Zeiss-Str. 15, Postfach 1437, 28857 Syke, Germany</p>	
<p>Test specification.....:</p> <p>Standard.....: EN 61347-2-13:2006 which used in conjunction with EN 61347-1: 2008+A1:2011.</p>	
<p>Test procedure.....: LVD report</p> <p>Non-standard test method.....: N/A</p>	
<p>Test Report Form No.....: ITEK_EN61347-2-13</p> <p>Test Report Form(s) Originator...: ITEK</p> <p>Master TRF.....: Dated 2013-12</p> <p>Test item description.....: LED Driver</p> <p>Trade Mark.....: RUTEC</p> <p>Manufacturer.....: XXXXXXXXXX</p>	
<p>Model/Type reference.....: 85470,85417,85475,85418,85670,85419,85570,85433,85471,85415, 85476,85416,85770,85422,85870,85421,85970,85420</p> <p>Ratings.....: 100-240Vac, 50/60Hz</p> <p style="margin-left: 40px;">1.0A max. for models:</p> <p style="margin-left: 40px;">85470, 85417, 85475, 85418, 85670, 85419, 85570, 85433</p> <p style="margin-left: 40px;">1.4A max. for models:</p> <p style="margin-left: 40px;">85471, 85415, 85476, 85416, 85770, 85422, 85870, 85421, 85970, 85420</p>	


Summary of testing:	
<p>Tests performed (name of test and test clause):</p> <p>All applicable tests were performed. Details see appended clauses and tables.</p> <p>The equipment operated at maximum specified DC-load with maximum power condition.</p> <p>The test samples are pre-production without serial numbers.</p> <p>The maximum operational ambient temperature as specified by the manufacturer is $t_a = 40\text{ }^\circ\text{C}$.</p> <p>The maximum operation temperature of the case as specified by the manufacturer is $t_c = 80\text{ }^\circ\text{C}$.</p> <p>Double M test requirement is verified according to DIN VDE 0710-14 as follows:</p> <p>Heating test was conducted according to the installation instruction.</p> <ul style="list-style-type: none"> - During temp-rise test, the mounting surface and any other neighboring surfaces did not exceed $95\text{ }^\circ\text{C}$. - During abnormal-test, the mounting surface and any other neighboring surfaces did not exceed $115\text{ }^\circ\text{C}$. <p>Tests were performed in a wooden test box with the following dimension:</p>  <p>Unless otherwise specified, tests were performed on model 85471 to represent other similar models.</p>	<p>Testing location:</p> <p>All tests as described in Test Case and Measurement Sections were performed at the laboratory described on page 1.</p>

Copy of marking plate







LED Netzgerät
Art.-Nr. : 85470
 Input: 100-240V AC 1A 50/60Hz IP64 LPS
 Output: 12V DC; 3A
 P-out: 36W
 ta=40°C tc=80°C


● AC L(BROWN)
 ● AC N(BLUE)






 ○ V+ (RED)
 ○ V- (BLACK)







LED Netzgerät
Art.-Nr. : 85417
 Input: 100-240V AC 1A 50/60Hz IP64 LPS
 Output: 12V DC; 2.8A
 P-out: 33.6W
 ta=40°C tc=80°C


● AC L(BROWN)
 ● AC N(BLUE)






 ○ V+ (RED)
 ○ V- (BLACK)







LED Netzgerät
Art.-Nr. : 85475
 Input: 100-240V AC 1A 50/60Hz IP64 LPS
 Output: 24V DC; 1.5A
 P-out: 36W
 ta=40°C tc=80°C


● AC L(BROWN)
 ● AC N(BLUE)






 ○ V+ (RED)
 ○ V- (BLACK)







LED Netzgerät
Art.-Nr. : 85418
 Input: 100-240V AC 1A 50/60Hz IP64 LPS
 Output: 24V DC; 1.4A
 P-out: 33.6W
 ta=40°C tc=80°C


● AC L(BROWN)
 ● AC N(BLUE)






 ○ V+ (RED)
 ○ V- (BLACK)







LED Netzgerät
Art.-Nr. : 85670
 Input: 100-240V AC; 1A; 50/60Hz IP64 LPS
 Output: 36V DC; 1A
 P-out: 36W
 ta=40°C tc=80°C











● AC L(BROWN)
 ● AC N(BLUE)






 ○ V+ (RED)
 ○ V- (BLACK)


LED Netzgerät
Art.-Nr. : 85419
 Input: 100-240V AC 1A 50/60Hz IP64 LPS
 Output: 36V DC; 1.05A
 P-out: 37.8W
 ta=40°C tc=80°C

● AC L(BROWN)
 ● AC N(BLUE)






 ○ V+ (RED)
 ○ V- (BLACK)

<ul style="list-style-type: none"> ● AC L(BROWN) ● AC N(BLUE) 	 <p>LED Netzgerät Art.-Nr. : 85570 Input: 100-240V AC 1A 50/60Hz Output: 48V DC; 0.75A P-out: 36W ta=40°C tc=80°C</p> <p>IP64 LPS</p>  <p>V+ (RED) V- (BLACK)</p>
<ul style="list-style-type: none"> ● AC L(BROWN) ● AC N(BLUE) 	 <p>LED Konverter Konstantstrom Art.-Nr. : 85433 Input: 100-240V AC 1A 50/60Hz Output: 48V DC; 700mA P-out: 21-36W ta=40°C tc=80°C Kurzschluss- + Überlastschutz</p> <p>IP64 LPS</p>  <p>V+ (RED) V- (BLACK)</p>
<ul style="list-style-type: none"> ● AC L(BROWN) ● AC N(BLUE) <p>ta=40°C tc=80°C</p>	 <p>LED Netzgerät Art.-Nr. : 85471 Input: 100-240V AC 1.4A 50/60Hz Output: 12V DC; 5A P-out: 60W</p> <p>IP64 LPS</p>  <p>V+ (RED) V- (BLACK)</p>
<ul style="list-style-type: none"> ● AC L(BROWN) ● AC N(BLUE) <p>ta=40°C tc=80°C</p>	 <p>LED Netzgerät Art.-Nr. : 85415 Input: 100-240V AC 1.4A 50/60Hz Output: 12V DC; 5A P-out: 60W</p> <p>IP64 LPS</p>  <p>V+ (RED) V- (BLACK)</p>
<ul style="list-style-type: none"> ● AC L(BROWN) ● AC N(BLUE) <p>ta=40°C tc=80°C</p>	 <p>LED Netzgerät Art.-Nr. : 85476 Input: 100-240V AC 1.4A 50/60Hz Output: 24V DC; 2.5A P-out: 60W</p> <p>IP64 LPS</p>  <p>V+ (RED) V- (BLACK)</p>

<ul style="list-style-type: none"> ● AC L(BROWN) ● AC N(BLUE) <p>ta=40°C tc=80°C</p>	 <p>LED Netzgerät Art.-Nr. : 85416 Input: 100-240V AC 1.4A 50/60Hz Output: 24V DC; 2.5A P-out: 60W</p>	 <p>IP64 LPS CE</p> 
<ul style="list-style-type: none"> ● AC L(BROWN) ● AC N(BLUE) <p>ta=40°C tc=80°C</p>	 <p>LED Netzgerät Art.-Nr. : 85770 Input: 100-240V AC 1.4A 50/60Hz Output: 36V DC; 1.67A P-out: 60W</p>	 <p>IP64 LPS CE</p> 
<ul style="list-style-type: none"> ● AC L(BROWN) ● AC N(BLUE) <p>ta=40°C tc=80°C</p>	 <p>LED Netzgerät Art.-Nr. : 85422 Input: 100-240V AC 1.4A 50/60Hz Output: 36V DC; 1.67A P-out: 60W</p>	 <p>IP64 LPS CE</p> 
<ul style="list-style-type: none"> ● AC L(BROWN) ● AC N(BLUE) <p>ta=40°C tc=80°C</p>	 <p>LED Netzgerät Art.-Nr. : 85870 Input: 100-240V AC 1.4A 50/60Hz Output: 42V DC; 1.40A P-out: 58.8W</p>	 <p>IP64 LPS CE</p> 
<ul style="list-style-type: none"> ● AC L(BROWN) ● AC N(BLUE) <p>ta=40°C tc=80°C</p>	 <p>LED Netzgerät Art.-Nr. : 85421 Input: 100-240V AC 1.4A 50/60Hz Output: 42V DC; 1.4A P-out: 58.8W</p>	 <p>IP64 LPS CE</p> 

<ul style="list-style-type: none">● AC L(BROWN)● AC N(BLUE)		<p>LED Netzgerät Art.-Nr. : 85970 Input: 100-240V AC 1.4A 50/60Hz Output: 48V DC; 1.25A P-out: 60W</p>	 V+ (RED) V- (BLACK)
<p>ta=40°C tc=80°C</p>			

<ul style="list-style-type: none">● AC L(BROWN)● AC N(BLUE)		<p>LED Netzgerät Art.-Nr. : 85420 Input: 100-240V AC 1.4A 50/60Hz Output: 48V DC; 1.05A P-out: 50.4W</p>	 V+ (RED) V- (BLACK)
<p>ta=40°C tc=80°C</p>			



Test item particulars	
Classification of installation and use	Independent SELV controlgear
Supply Connection	Lead wires, terminal block
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	Dec., 2013
Date(s) of performance of tests	Dec., 2013
General remarks:	
<p>The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory. "(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 <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.</p>	
Manufacturer' s Declaration per subclause 6.2.5 of IEC 61347-2-13:	
Name and address of factory (ies)	
XXXX	
General product information:	
<p>The product is designed as Class II independent SELV controlgear, which filled with silicone molding resin inside completely, constant voltage type for LED lamp load.</p> <p>Models 85470, 85417, 85475, 85418, 85670, 85419, 85570, and 85433 are similar to models 85471, 85415, 85476, 85416, 85770, 85422, 85870, 85421, 85970, and 85420 except for type designation, rated input current, output ratings, PCB layout, enclosure shape, line filter, transformer and rating of some components which are not related to over-voltage protection, over-current protection and over-power protection. See components list for details information.</p> <p>The enclosures secured together by ultrasonic welding.</p> <p>The conductors of input/output wires shall be fixed into luminaire and kept min. 6.0mm from user accessible parts during installation.</p> <p>The product fulfils the requirements of IEC 61347-2-13:2006 used in conjunction with IEC 61347-1 (Second Edition) : 2007+A1:2010 and EN 61347-2-13:2006 which used in conjunction with EN 61347-1:2008+A1:2011.</p>	

Output rating:

Model#	DC output rating
85470	12Vdc, 3A
85417	12Vdc, 2.8A
85475	24Vdc, 1.5A
85418	24Vdc, 1.4A
85670	36Vdc, 1A
85419	36Vdc, 1.05A
85570	48Vdc, 0.75A
85433	48Vdc, 0.7A
85471	12Vdc, 5A
85415	12Vdc, 5A
85476	24Vdc, 2.5A
85416	24Vdc, 2.5A
85770	36Vdc, 1.67A
85422	36Vdc, 1.67A
85870	42Vdc, 1.4A
85421	42Vdc, 1.4A
85970	48Vdc, 1.25A
85420	48Vdc, 1.05A

EN 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
4	GENERAL REQUIREMENTS		P
	Compliance of independent controlgear enclosure with EN 60 598-1	Compliance with relevant requirement of EN 60 598-1. No hazards after 0.5Nm impact force on the enclosure.	P
	Independent SELV controlgear comply with Annex I	Compliance checked.	P

6 (6)	CLASSIFICATION		P
	Independent convertor..... :	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Built-in convertor	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Integral convertor	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	SELV-equivalent or isolating convertor	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Auto-wound convertor	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Independent SELV controlgear	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—

7	MARKING		P
7.1 (7.1)	Mandatory markings:		P
	- mark of origin	See copy of marking plates.	P
	- model number, type reference	See copy of marking plates.	P
	- symbol for independent convertor, if applicable	See copy of marking plates.	P
	- correlation between interchangeable parts and convertor marked	No user replaceable parts in the product.	N/A
	- rated supply voltage (V)	See copy of marking plate.	P
	- earthing symbol	Class II controlgear.	N/A
	- wiring diagram	See copy of marking plate and instruction.	P
	- value of t_c	$t_a = 40\text{ }^\circ\text{C}$; $t_c = 80\text{ }^\circ\text{C}$	P
	- symbol for declared temperature	See copy of marking plate.	P
	Constant voltage type:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	- rated supply voltage (V)	See copy of marking plate.	P
	Constant current type:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	- rated output current (A)		N/A
	- rated maximum output voltage (V)		N/A
	- indication if for LED modules only		N/A
7.2 (7.1)	- information to be provided, if applicable:		P

EN 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	- declaration on protection against accidental contact		P
	- cross-section of conductors (mm ²)	UL1015, 20AWG	P
	- number, type and wattage of lamp(s)		P
	- declaration of mains connected windings		P
	- declaration for SELV-equivalent convertor		N/A
- (7.2)	Marking durable and legible		P
	Rubbing 15 s water, 15 s petroleum; marking legible	Compliance checked.	P

8 (10)	PROTECTION AGAINST ACCIDENTAL CONTACT WITH LIVE PARTS		P
- (10.1)	Controlgear protected against accidental contact with live parts	See below.	P
- (A2)	The current flowing between the part concerned and earth is measured and does not exceed 0,7 mA (peak) or 2 mA d.c. :	Measured max. 0.018mA (peak) from output (- or +) to earth.	P
- (A2)	For frequencies above 1 kHz, the current does not exceed 0,7 mA (peak) multiplied by the value of the frequency in kilohertz or 70 mA (peak)	The frequency was measured 60Hz.	P
- (A3)	The voltage between the part concerned and any accessible part is measured and does not exceed 34 V (peak)	For models 85470, 85417, 85475, 85418, 85471, 85415, 85476 and 85416, output voltages are measured below 34V. For other models, the output voltage exceed 34V. The conductors of input/output wires shall be fixed into luminaire and kept min. 6.0mm from user accessible parts during installation.	N/A
- (10.1)	Lacquer or enamel not used for protection or insulation	Not used.	P
	Adequate mechanical strength on parts providing protection	See following clauses.	P
- (10.2)	Capacitors > 0,5 μF: voltage after 1 min (V): < 50 V	Total capacitance is less than 0.5 μF (CX1 = 0.33 μF).	P
8.1	SELV-equivalent control gear accessible parts are insulated from live parts by double or reinforced insulation according 8.6 and 13.1 in IEC 60065	Not SELV-equivalent controlgear.	N/A
8.2	Exposed terminals of SELV or SELV-equivalent control gear if: - the rated or maximum rated output voltages ≤ 25 V r.m.s. - the no-load output voltage ≤ 30 V r.m.s. or 33 √2 V peak	Lead input/output wires shall be installed inside of luminaire and kept min. 6.0mm from user accessible part. The evaluation shall be down during installation.	N/A

EN 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Insulated terminals if convertor with rated output voltage > 25 V		N/A
	One capacitor Y1 or two capacitors Y2 complying with IEC 60384-14 of the same values used in series between SELV or SELV-equivalent output and primary circuits	Certified Y1 type capacitor complying with IEC/EN60384-14 is provided.	P
	Other components bridging the separating transformer complying with IEC 60065, clause 14		P

9 (8)	TERMINALS		N/A
	Separately approved, component list		N/A
	Screw terminals: compliance with Section 14 of IEC 60598-1		N/A
	Screw less terminals: compliance with Section 15 of IEC 60598-1		N/A

10 (9)	PROVISION FOR EARTHING		N/A
	Terminal complying with clause 8 in Part 1		N/A
	Locked against loosening and not possible to loosen by hand		N/A
	Not possible to loosen clamping means unintentionally on screw less terminals		N/A
	Earthing via means of fixing		N/A
	Earthing terminal only used for the earthing of the control gear		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
	Earth contact via the track on the printed board		N/A
	Test with a current of 25 A between earthing terminal and each of the accessible metal parts; measured resistance (Ω): < 0,5 Ω		N/A

11 (11)	MOISTURE RESISTANCE AND INSULATION		P
	After storage 48 h at 91-95% relative humidity and 20-30 °C measuring of insulation resistance with d.c. 500 V (M Ω):		P

EN 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	For basic insulation $\geq 2 \text{ M}\Omega$	Humidity treatment performed after storage 48 h at 93 % and 25 °C. Between input live parts of different polarity (primary fusible resistor disconnected) measured: more than 9999M Ω .	P
	For double or reinforced insulation $\geq 4 \text{ M}\Omega$	Humidity treatment performed after storage 48 h at 93 % and 25 °C. Between input live parts and output circuits measured: more than 9999 M Ω . Between input live parts / output parts and plastic enclosure wrapped with metal foil measured: more than 9999M Ω .	P
	Adequate insulation between input and output terminals not bounded together in SELV-equivalent control gear	Not SELV-equivalent controlgear.	--

12 (12)	ELECTRIC STRENGTH		P
	Immediately after clause 11 electric strength test for 1 min		P
	Working voltage $\leq 42 \text{ V}$, test voltage 500 V		N/A
	Working voltage $> 42 \text{ V} \leq 1000 \text{ V}$, test voltage (V):		P
	Basic insulation, 2U + 1000 V	See appended table 12.	P
	Supplementary insulation, 2U + 1750 V		N/A
	Double or reinforced insulation, 4U + 2750 V	See appended table 12.	P
	No flashover or breakdown		P
	Windings in separating transformers in SELV-equivalent convertors according to 14.3.2 of IEC 60065	Not SELV-equivalent controlgear.	N/A

14 (14)	FAULT CONDITIONS (Carried out on three samples)		P
	When operated under fault conditions the control gear:		P
	- does not emit flames or molten material	Compliance checked.	P
	- does not produce flammable gases	Compliance checked.	P
	- protection against accidental contact not impaired	Compliance checked.	P
	Thermally protected ballasts does not exceed the marked temperature value	Compliance checked.	P

EN 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected	(see appended table 14)	P
- (14.1)	Short-circuit of creepage distances and clearances if less than specified in clause 18 (except between live parts and accessible metal parts)	Not applicable.	N/A
	Creepage distances on printed boards less than specified in clause 18 provided with coating according to IEC 60664-3	No such coating.	N/A
- (14.2)	Short-circuit or interruption of semiconductor devices	(see appended table 14)	P
- (14.3)	Short-circuit across insulation consisting of lacquer, enamel or textile	Not applicable.	N/A
- (14.4)	Short-circuit across electrolytic capacitors	(see appended table 14)	P
- (14.5)	After the tests has been carried out on three samples:		P
	The insulation resistance $\geq 1 \text{ M}\Omega$	More than 1000 $\text{M}\Omega$.	P
	No flammable gases	Compliance checked.	P
	No accessible parts have become live	Compliance checked.	P
	During the tests, a five-layer tissue paper, where the test specimen is wrapped, does not ignite	Compliance checked.	P
- (14.6)	Relevant fault condition tests with high-power supply	Compliance checked.	—
	Temperature declared thermally protected lamp control gear fulfil requirements in Annex C	Not declared as thermally protected lamp controlgear.	N/A

15	TRANSFORMER HEATING		P
	Windings of separating transformer in a SELV-equivalent control gear fulfil the requirements according to 7.1 and 11.2 of IEC 60065	Not SELV-equivalent controlgear.	N/A
15.1	Temperatures do not exceed the changed values of the values in column 2 of Table 3 of IEC 60065, in respect to relevant ambient temperature at t_c , under normal operation		N/A
15.2	Temperatures do not exceed the changed values of the values in column 3 of Table 3 of IEC 60065, in respect to relevant ambient temperature at t_c , under abnormal conditions of Cl. 16 and fault conditions of Cl. 14	See table 15.2.	P
	Ambient temperature at t_c	(see appended table)	—

EN 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
16	ABNORMAL CONDITIONS		P
	Safety not impaired when the control gear is operated at any voltage between 90% and 110% of rated voltage	(see appended table)	P
16.1	Control gear which are of the constant voltage output type:		P
	a) No LED module inserted	See appended table 15.2.	P
	b) Double LED modules or equivalent load connected to the output terminals	See appended table 15.2.	P
	c) Output terminal short-circuited (20 cm and 200 cm or declared length)	See appended table 15.2. Tests were applied with the length of the output cable of both, 20 cm and 200 cm.	P
	During and at the end of the tests no defect impairing safety, nor any smoke or flammable gases produced	Compliance checked.	P
16.2	Control gear which are of the constant current output type:		N/A
	a) No LED module connected		N/A
	b) Double the LED modules or equivalent load connected in series to the output terminals		N/A
	c) Output terminal short-circuited (20 cm and 200 cm or declared length)		N/A
	Maximum output voltage not exceeded		N/A
	During and at the end of the tests no defect impairing safety, nor any smoke or flammable gases produced		N/A

17 (15)	CONSTRUCTION		P
- (15.1)	Wood, cotton, silk, paper and similar fibrous material not used as insulation		N/A
- (15.2)	Printed boards used as internal connections complies with clause 14		P
	Socket-outlet in the output circuit does not accept plugs complying with IEC 60083 and IEC 60906		N/A
	Not possible to engage plugs accepted by socket-outlet in the output circuit with socket-outlets complying with IEC 60083 and IEC 60906		N/A

18 (16)	CREEPAGE DISTANCES AND CLEARANCES		P
	Creepage distances and clearances according to Table 3 and 4, as appropriate	(see appended table)	P
	Printed boards see clause 14		N/A
	Insulating lining of metallic enclosures		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

19 (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	All current carrying connections are metal to metal.	P
(4.11.2)	Screws:		N/A
	- self-tapping screws		N/A
	- thread-cutting screws		N/A
	- at least two self-tapping 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	All current carrying connections are metal to metal.	P
(4.11.5)	No contact to wood		N/A
(4.12)	Mechanical connections and glands		N/A
(4.12.1)	Mechanical stress		N/A
	Screws not made of soft metal		N/A
	Screws of insulating material		N/A
	Torque test: part; torque (Nm) :		N/A
	Torque test: part; torque (Nm) :		N/A
	Torque test: part; torque (Nm) :		N/A
(4.12.2)	Screw diameter < 3 mm screwed into metal		N/A
(4.12.4)	Locked connections		N/A
(4.12.5)	Screwed glands: force (N) :	No such devices.	N/A

20 (18)	RESISTANCE TO HEAT, FIRE AND TRACKING		P
- (18.1)	Parts of insulating material retaining live parts in position, ball-pressure test:		P
	- part; test temperature (°C) :	75°C ball-pressure test was carried out on the plastic enclosure material as follows: Sabic Innovative Plastics B V, type 940: measured 0.49mm Bayer Thai Co Ltd, type 6485: measured 0.43mm.	P

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Clause	Requirement + Test	Result - Remark	Verdict
	- part; test temperature (°C)	The phenolic bobbin material used for bobbin of transformer is accepted without further test.	P
- (18.2)	Printed boards in accordance with 8.7 of IEC 61189-2 and relevant parts of IEC 61249-2	UL approved PCB is accepted without test.	P
- (18.3)	External parts of insulating material preventing electric shock glow-wire test 650 °C	Tested for plastic enclosure as follows: Sabic Innovative Plastics B V, type 940. Bayer Thai Co Ltd, type 6485.	P
- (18.4)	Parts of insulating material retaining live parts in position, needle-flame test 10 s:		P
	- flame extinguished within 30 s	Tested for bobbin material of transformer as follows: Sabic Innovative Plastics B V, type 940. Bayer Thai Co Ltd, type 6485.	P
	- no flaming drops igniting tissue paper	Compliance checked.	P
- (18.5)	Tracking test according section 13 of IEC 60598-1 if required	Not applicable.	N/A

21 (19)	RESISTANCE TO CORROSION			N/A
	Applicable parts comply with 4.18.1 of IEC 60598-1			N/A
	Adequate varnish on the outer surface			N/A

- (20)	NO-LOAD OUTPUT VOLTAGE			N/A
	No load output voltage not differ more than 10 % from rated voltage			N/A

14	TABLE: tests of fault conditions				P
Part	Simulated fault				Hazard Yes / No
--	Fault condition	Result			--
--	--	Time	Input current during fault	Observation	--
Tested on model 85417, Input condition: 264Vac / 60Hz					
U3 pin 1 to pin 2	s-c	10 mins	0.03 to 0.22	Unit cycle protection	No

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Clause	Requirement + Test			Result - Remark	Verdict
U3 pin 3 to pin 4	s-c	10 mins	0.03	Unit shut down	No
T1 pin 8 to pin 11	s-c	10 mins	0.03	Unit shut down	No
T10 pin 4 to pin 1	s-c	10 mins	0.03	Unit shut down	No
Q2 D to G	s-c	1 sec	--	Fuse opened (F1), Component damaged (Q2, R20)	No
Q2 D to S	s-c	1 sec	--	Fuse opened (F1), Components damaged (Q2, R20)	No
C7	s-c	1 sec	--	Fuse opened (F1), Component damaged (BD1)	No
BD1 pin 1 to pin 2	s-c	1 sec	--	Fuse opened (F1), Component damaged (BD1)	No
Tested on model 85471, Input condition: 264Vac / 60Hz					
U3 pin 1 to pin 2	s-c	10 mins	0.03 to 0.22	Unit cycle protection	No
U3 pin 3 to pin 4	s-c	10 mins	0.03	Unit shut down	No
T1 pin 8 to pin 11	s-c	10 mins	0.03	Unit shut down	No
T10 pin 4 to pin 1	s-c	10 mins	0.03	Unit shut down	No
Q2 D to G	s-c	1 sec	--	Fuse opened (F2), Components damaged (Q2, R24, R26~R29)	No
Q2 D to S	s-c	1 sec	--	Fuse opened (F2), Components damaged (Q2, R24, R26~R29)	No
C7	s-c	1 sec	--	Fuse opened (F2)	No
BD1 pin 1 to pin 2	s-c	1 sec	--	Fuse opened (F2)	No
Supplementary information: 1. In fault condition column: s-c=short-circuited. 2. Tests were performed under enclosure temp. at tc.					

18 (16)	TABLE: creepage distances and clearances	P
	Minimum distances for a.c. (50/60 Hz) sinusoidal voltages	

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Clause	Requirement + Test			Result - Remark			Verdict
	RMS working voltage (V) not exceeding	50	150	250	500	750	1000
	1) minimum distances between live parts of different polarity. Specify the value measured.	N/A	N/A	See append table 18(16)a	N/A	N/A	N/A
	2) minimum distances between live parts and accessible parts which are permanently fixed to the ballast, including screws or devices for fixing covers or fixing the ballast to its support. Specify the value measured.	N/A	N/A	See append table 18(16)a	N/A	N/A	N/A
	- required creepage distances (mm), insulation PTI ≥ 600	0,6	1,4	1,7	3	4	5,5
	- required creepage distances (mm), insulation PTI < 600	1,2	1,6	2,5	5	8	10
	- required clearances (mm)	0,2	1,4	1,7	3	4	5,5
	3) minimum distances between live parts and a flat supporting surface or a loose metal cover, if any, if the construction does not ensure that the values under 2 above are maintained under the most unfavourable circumstances	N/A	N/A	N/A	N/A	N/A	N/A
	- required clearances (mm)	2	3,2	3,6	4,8	6	8
	Minimum distances for non-sinusoidal pulse voltages						
	rated pulse voltage (peak kV)	2,0	2,5	3,0	4,0	5,0	6,0
	required minimum distances, clearances (mm)	1,0	1,5	2	3	4	5,5
	Specify the value measured	N/A	N/A	N/A	N/A	N/A	N/A
	rated pulse voltage (peak kV)	10	12	15	20	25	30
	required minimum distances, clearances (mm)	11	14	18	25	33	40
	Specify the value measured	N/A	N/A	N/A	N/A	N/A	N/A
	rated pulse voltage (peak kV)	50	60	80	100	-	-
	required minimum distances, clearances (mm)	75	90	130	170	-	-
	Specify the value measured	N/A	N/A	N/A	N/A	-	-

A	ANNEX A (NORMATIVE), TEST TO ESTABLISH WHETHER A CONDUCTIVE PART IS A LIVE PART WHICH MAY CAUSE AN ELECTRIC SHOCK	P
A.2	See clause 8 A.2 in this Test Report	See clause 8. P
A.3	See clause 8 A.3 in this Test Report	See clause 8. P

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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)		P

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 ... :		N/A

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		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 convertor 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

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

E	ANNEX E – USE OF CONSTANT S OTHER THAN 4500 IN t_w TESTS		N/A
	Annex E if windings of 50 Hz/60 Hz		N/A
E1	Constant S claimed		N/A
	Claimed test method		N/A
E2	Procedure A		N/A
	Adequate data provided by the manufacturer		N/A
	The inverse of the slope is greater than or equal to the claimed value of S		N/A
	Compliance with the failure criteria for procedure B		N/A
E3	Procedure B		N/A
	Claimed value of T_1		N/A
	Claimed value of T_2		N/A
	Endurance test carried out at:		N/A
	T_1 (7 samples)		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	T ₂ (7 samples)		N/A
	Duration of test calculated from equation (2)		N/A
	T ₁		N/A
	T ₂		N/A
	During the test: - No open circuit - No breakdown insulation		N/A
	The claimed constant S is deemed to be verified		N/A

F	ANNEX F - DRAUGHT-PROOF ENCLOSURE		P
	Draught-proof enclosure in accordance with the description		N/A
	Dimensions of the enclosure		N/A
	Other design; description	Draught-proof type heating chamber used.	P

H	ANNEX H - TESTS		P
	All tests performed in accordance with the advice given in Annex H, if applicable	Compliance checked.	P

I	ANNEX I - PARTICULAR ADDITIONAL REQUIREMENTS FOR INDEPENDENT SELV D.C. OR A.C. SUPPLIED ELECTRONIC STEP-DOWN CONVERTORS FOR FILAMENT LAMPS		P
I.3	Classification		P
I.3.1	Class I	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Class II	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
I.3.2	a) non-inherently short circuit proof controlgear	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	b) non-inherently open circuit proof controlgear	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	c) inherently short circuit proof controlgear	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	d) inherently open circuit proof controlgear	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	e) fail safe controlgear	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	f) non-short-circuit proof controlgear	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	g) non-open-circuit proof controlgear	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
I.4	Marking		P
	Adequate symbols are used	See marking label.	P
I.5	Protection against electric shock		P
I.5.1	No connection between output winding and body		P

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Clause	Requirement + Test	Result - Remark	Verdict
	No connection between output winding and protective earthing circuit		N/A
1.5.2	Input and output circuits electrically separated from each other	Input circuits are separated from output circuits by double or reinforced insulation.	P
1.5.2.1	Insulation between input and output winding of the HF-transformer consists of double or reinforced insulation		P
	Class II: insulation between input/output and body consists of double or reinforced insulation	See table 18 (16) a.	P
	Class I: insulation between input and body consists of basic and between output and body supplementary insulation		N/A
1.5.2.2	Insulation between input and output winding via the core consists of double or reinforced insulation		P
	Insulation between cord and windings of the HD-transformer consists of basic insulation		N/A
1.5.2.3	Serrated tape, additional layer		P
1.5.2.4	Class I controlgear for fixed connection provided with basic insulation plus protective screening comply with the following conditions:		N/A
	a) Insulation between the input winding and the protective screen complies with the requirements for basic insulation		N/A
	b) Insulation between the protective screen and the output winding complies with the requirements for basic insulation		N/A
	c) Metal screen consists of a metal foil or of a wire wound screen		N/A
	d) Metal screen so arranged that both edges cannot simultaneously touch a magnetic core		N/A
	e) Metal screen and its lead-out wire have a cross-section sufficient to ensure that an overload device will open the circuit before the screen is destroyed		N/A
	f) Lead-out wire sufficiently fixed to the metal screen		N/A
1.6	Heating		P
1.6.1	No excessive temperatures in normal use	See below.	P
	Used material classified as Class	Class B.	—
	Stated value of t_a	40°C.	—
1.6.2	Temperature rises (Upri: 1.06 time supply rated voltage)		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Determined temperature rises in windings: - Primary (K) : - Limit max (K) : - Secondary (K) : - Limit max (K) :	See appended table 15.1/1.6 for test results.	P
	After the test:		P
	- no connections have worked loose		P
	- no reduction of creepage distances and clearances		P
	- no flow of sealing compound		P
	- no operation of protecting devices		P
	- electric strength test between input and output windings	3750Vac, no breakdown.	P
I.6.3	Cycling test (10 cycles):		N/A
I.6.3.1	- heat run at (K) :		N/A
I.6.3.2	- moisture treatment 48 h		N/A
I.6.3.3	- vibration test 1 h; 1,5 g		N/A
I.6.3.4	After the tests:		N/A
	- insulation resistance $\geq 2, 4$ or $5 \text{ M}\Omega$		N/A
	- dielectric strength test for 2 min. at 35 % of specified value in table I.6		N/A
	- Current or the ohmic component does not deviates by more than 30 %		N/A
I.7	Short-circuit and overload protection		P
I.7.1	Upri: 1.06 times rated voltage or 0.94 and 1.06 times rated supply voltage (V) :	Refer appended table I.7.	P
I.7.2 I.7.3 I.7.4	Determined temperature rise in windings and on other parts:		P
	- test according to Clause :	I.7.3.	P
	- Primary winding (K) :	Refer appended table I.7.	P
	- Limit max (K) :	125 K. [150-10-(40-25)]	P
	- Secondary winding (K) :		N/A
	- Limit max (K) :		N/A
	- External enclosure ≤ 80 (K) :	Refer appended table I.7.	P
	- Rubber insulation of wiring ≤ 60 (K) :		N/A
	- PVC insulation of wiring ≤ 60 (K) :		P
	- Supports ≤ 80 (K) :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
I.7.5	Fail-safe convertors		N/A
I.7.5.1	- Upri: 1.06 times rated supply voltage V:		—
	- Isec: 1.5 times rated output current A:		—
	- time until steady-state conditions t1 (h) :		—
	- time until failure t2 (h): ≤ t1; ≤ 5 h..... :		N/A
I.7.5.2	During the test:		N/A
	- no flames, molten material, etc.		N/A
	- temperature rise of enclosure ≤ 150 K		N/A
	- temperature rise of plywood support ≤ 100 K		N/A
	After the test:		N/A
	- electric strength (test voltage; 35 % of specified value); no flashover or breakdown for primary-to-secondary and for primary-to-body		N/A
	- live parts not accessible by test finger through holes of enclosure		N/A
I.8	Insulation resistance and electric strength		P
I.8.1	Conditioned 48 h between 91 % and 95 %		P
I.8.2	Adequate insulation (500 V d.c. for 1 min) between:		P
	Live parts and the body -for basic insulation not less than 2 MΩ :		N/A
	Live parts and the body -for reinforced insulation not less than 4 MΩ :	More than 9999 MΩ.	P
	Input- and output circuits not less than 5 MΩ :	More than 9999 MΩ.	P
	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
	Metal foil in contact with the inner and outer surfaces of enclosures of insulating material not less than 2 MΩ :		N/A
I.8.3	Electric strength test:		P
	1) Between live parts of input circuits and live parts of output circuits :	Between input circuits and output circuits: AC 3750V.	P
	2) Over basic or supplementary insulation between:		P
	a) live parts which are or may become of different polarity :	Different polarity (fuse opened): AC 1875V	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

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Clause	Requirement + Test	Result - Remark	Verdict
	e) intermediate metal parts and the body		N/A
	3) Over reinforced insulation between the body and live parts	3750 Vac.	P
	No flashover or breakdown occurred		P
I.9	Construction		P
I.9.1	Comply with all requirements		P
I.9.2	The distance between input and output terminals shall not be less than 25 mm	It shall be evaluated after installation.	P
I.10	Components		N/A
I.10.1	Socket-outlets in the output circuit does not accept plugs complying with IEC 60083 and IEC 60906-1		N/A
I.10.2	Self-resetting protective devices shall not be used unless it is certain that there will be no hazards		N/A
	Compliance is checked by connecting the convertor for 48 h at 1.06 times the rated voltage with the output short-circuited		N/A
I.11	Creepage distances and clearances		P
	1. Insulation between input and output circuits:		P
	a) measured values \geq specified values (mm)	See table 18(16)a.	P
	b) measured values \geq specified values (mm)		N/A
	c) measured values \geq specified values (mm)	Certified triple insulated wire used. Enclosure with thickness min. 1.5mm used.	P
	2. Insulation between adjacent <u>input</u> circuits: measured values \geq specified values (mm)		N/A
	2. Insulation between adjacent <u>output</u> circuits: measured values \geq specified values (mm)		N/A
	3. Insulation between terminals for external connection:		N/A
	a) measured values \geq specified values (mm)		N/A
	b) measured values \geq specified values (mm)		N/A
	c) measured values \geq specified values (mm)		N/A
	4. Basic or supplementary insulation:		P
	a) measured values \geq specified values (mm)	See table 18(16)a.	P
	b) measured values \geq specified values (mm)		N/A
	c) measured values \geq specified values (mm)		N/A
	5. Reinforced insulation: measured values \geq specified values (mm)	See table 18(16)a.	P
	6. Distande through insulation:		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	a) measured values \geq specified values (mm) :		N/A
	b) measured values \geq specified values (mm) :		N/A
	c) measured values \geq specified values (mm) :		N/A
	d) measured values \geq specified values (mm) :		N/A

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Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX 1: components	P
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object/part No.	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity
Plastic Enclosure	BAYER THAI CO LTD	6485	V-0 or better, 115°C min. 1.5 mm thick.	--	UL
Plastic Enclosure	SABIC INNOVATIVE PLASTICS B V	940	V-0 or better, 120°C min. 1.5 mm thick.	--	UL
PWB	Various	Various	V-1 or better, 105°C	--	UL
Fuse (F1) For models: 85470, 85417, 85475, 85418, 85670, 85419, 85570, 85433	Cooper Bussman Inc	SS-5	T2A/250Vac	IEC/EN 60127-1 IEC/EN 60127-3	UL, VDE
	Wickmann-Werke	392	T2A/250Vac	IEC/EN 60127-1 IEC/EN 60127-3	UL, VDE
	Walter	2010	T2A/250Vac	IEC/EN 60127-1 IEC/EN 60127-3	UL, VDE
	Conquer	MST	T2A/250Vac	IEC/EN 60127-1 IEC/EN 60127-3	UL, VDE
	Littelfuse Inc	392	T2A/250Vac	IEC/EN 60127-1 IEC/EN 60127-3	UL, VDE
	Hollyland	5ET-SERIES	T2A/250Vac	IEC/EN 60127-1 IEC/EN 60127-3	UL, VDE
	NIPPON	SLT	T2A/250Vac	IEC/EN 60127-1 IEC/EN 60127-3	UL, VDE
Fuse (F1) (*Optional) For models: 85471, 85415, 85476, 85416, 85770, 85422, 85870, 85421, 85970, 85420	Cooper Bussman Inc	SS-5	T6.3A/250Vac	IEC/EN 60127-1 IEC/EN 60127-3	UL, VDE
	Wickmann-Werke	392	T6.3A/250Vac	IEC/EN 60127-1 IEC/EN 60127-3	UL, VDE
	Walter	2010	T6.3A/250Vac	IEC/EN 60127-1 IEC/EN 60127-3	UL, VDE

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Clause	Requirement + Test			Result - Remark	Verdict
	Conquer	MST	T6.3A/250Vac	IEC/EN 60127-1 IEC/EN 60127-3	UL, VDE
	Littelfuse Inc	392	T6.3A/250Vac	IEC/EN 60127-1 IEC/EN 60127-3	UL, VDE
	Hollyland	5ET-SERIES	T6.3A/250Vac	IEC/EN 60127-1 IEC/EN 60127-3	UL, VDE
	NIPPON	SLT	T6.3A/250Vac	IEC/EN 60127-1 IEC/EN 60127-3	UL, VDE
Fuse (F2) For models: 85471, 85415, 85476, 85416, 85770, 85422, 85870, 85421, 85970, 85420	Cooper Bussman Inc	SS-5	T3.15A/250Vac	IEC/EN 60127-1 IEC/EN 60127-3	UL, VDE
	Wickmann- Werke	392	T3.15A/250Vac	IEC/EN 60127-1 IEC/EN 60127-3	UL, VDE
	Walter	2010	T3.15A/250Vac	IEC/EN 60127-1 IEC/EN 60127-3	UL, VDE
	Conquer	MST	T3.15A/250Vac	IEC/EN 60127-1 IEC/EN 60127-3	UL, VDE
	Littelfuse Inc	392	T3.15A/250Vac	IEC/EN 60127-1 IEC/EN 60127-3	UL, VDE
	Hollyland	5ET-SERIES	T3.15A/250Vac	IEC/EN 60127-1 IEC/EN 60127-3	UL, VDE
	NIPPON	SLT	T3.15A/250Vac	IEC/EN 60127-1 IEC/EN 60127-3	UL, VDE
Y1 Capacitor (CY1) (Optional) (Y1 type)	Murata MFG Co Ltd	KX	Min. 250 V, Max. 3300 pF, 125 °C	IEC/EN 60384-14	UL, VDE
	TDK Corp	CD	Min. 250 V, Max. 3300 pF, 125 °C	IEC/EN 60384-14	UL, VDE
	Jya-Nay Co Ltd	JN	Min. 250 V, Max. 3300 pF, 125 °C	IEC/EN 60384-14	UL, VDE
	Pan Overseas Electronic Co Ltd	AH	Min. 250 V, Max. 3300 pF, 125 °C	IEC/EN 60384-14	UL, VDE
	Success Electronics Co Ltd	SE	Min. 250 V, Max. 3300 pF, 125 °C	IEC/EN 60384-14	UL, VDE
	Welson Industrial Co Ltd	WD	Min. 250 V, Max. 3300 pF, 125°C	IEC/EN 60384-14	UL, VDE

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Clause	Requirement + Test			Result - Remark	Verdict
X Capacitor (CX1) (Optional)	KEMET	R.46	Max. 0.33 μ F, min. 250 Vac, 100 $^{\circ}$ C.	IEC/EN 60384-14, UL 1414	ENEC, UL
	Hua Jung Components Co Ltd	MKP	Max. 0.33 μ F, min. 250 Vac, 110 $^{\circ}$ C.	IEC/EN 60384-14, UL 1414	VDE, UL
	Okaya Electric Industries Co Ltd	RE	Max. 0.33 μ F, min. 250 Vac, 100 $^{\circ}$ C.	IEC/EN 60384-14, UL 1414	VDE, UL
	Okaya Electric Industries Co Ltd	LE	Max. 0.33 μ F, min. 250 Vac, 110 $^{\circ}$ C.	IEC/EN 60384-14, UL 1414	VDE, UL
	Ultra Tech Xiphi Enterprise Co Ltd	HQX	Max. 0.33 μ F, min. 250 Vac, 100 $^{\circ}$ C.	IEC/EN 60384-14, UL 1414	VDE, UL
	Jenn Fu Electronics Corp	MPX	Max. 0.33 μ F, min. 250 Vac, 100 $^{\circ}$ C.	IEC/EN 60384-14, UL 1414	VDE, UL
	Pilkor Electronics Co Ltd	PCX2 337	Max. 0.33 μ F, min. 250 Vac, 100 $^{\circ}$ C.	IEC/EN 60384-14, UL 1414	VDE, UL
	Vishay Capacitors Belgium N V	F1772, F1774	Max. 0.33 μ F, min. 250 Vac, 100 $^{\circ}$ C.	IEC/EN 60384-14, UL 1414	VDE, UL
	Europtronic (Taiwan) Industrial Corp	MPX	Max. 0.33 μ F, min. 250 Vac, 105 $^{\circ}$ C.	IEC/EN 60384-14, UL 1414	VDE, UL
	Europtronic (Taiwan) Industrial Corp	MPX2	Max. 0.33 μ F, min. 250 Vac, 105 $^{\circ}$ C.	IEC/EN 60384-14, UL 1414	VDE, UL
Bleeder Resistor (R3, R6) For models: 85470, 85417, 85475, 85418, 85670, 85419, 85570, 85433	--	--	Max. 1.5M Ω , Min. 1/4 W	--	--
Bleeder Resistor (R3, R6) For models: 85471, 85415, 85476, 85416, 85770, 85422, 85870, 85421, 85970, 85420	--	--	Max. 2 M Ω , Min. 1/4 W	--	--
Optical Isolator (U3)	Lite-On Technology Corp	LTV-817	di = 0.5 mm, int. dcr = 4.9 mm, ext. dcr = 8.2 mm, 5000 Vac, 100 $^{\circ}$ C	IEC/DIN EN 60747-5-2:2003 IEC/EN 60950-1	UL, VDE

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Clause	Requirement + Test			Result - Remark	Verdict
	Cosmo Electronics Corp	K1010 , KPC817	di = 0.5 mm, int. dcr = 5.3 mm, ext. dcr = 8.0 mm, 5000 Vac, 100 °C	IEC/DIN EN 60747-5-2:2003 IEC/EN 60950-1	UL, VDE
	Sharp Corp Electronic Components Group	PC817	di = 0.9 mm, int. dcr = 6.5 mm, ext. dcr = 8.0 mm, 5000 Vac, 100 °C	IEC/DIN EN 60747-5-2:2003 IEC/EN 60950-1	UL, VDE
	Sharp Corp Electronic Components Group	PC123	di = 0.7 mm, int. dcr = 5.0 mm, ext. dcr = 8.0 mm, 5000 Vac, 100 °C	IEC/DIN EN 60747-5-2:2003 IEC/EN 60950-1	UL, VDE
	Vishay Semiconductor Gmbh	TCET1109	di = 0.6 mm, int. dcr = 4.7 mm, ext. dcr = 8.4 mm, 5000 Vac, 100 °C	IEC/DIN EN 60747-5-2:2003 IEC/EN 60950-1	UL, VDE
	Nec Compound Semiconductor Devices Ltd	PS2561-1	di = 0.4 mm, int. dcr = 4.0 mm, ext. dcr = 7.0 mm, 5000 Vac, 100 °C	IEC/DIN EN 60747-5-2:2003 IEC/EN 60950-1	UL, VDE
	Toshib Corp. Semiconductor	TLP621	di = 0.8 mm, int. dcr = 4.0 mm, ext. dcr = 8.0 mm, 5000 Vac, 100 °C	IEC/DIN EN 60747-5-2:2003 IEC/EN 60950-1	UL, VDE
	Toshib Corp. Semiconductor	TLP721	di = 0.8 mm, int. dcr = 4.0 mm, ext. dcr = 8.0 mm, 4000 Vac, 100 °C	IEC/DIN EN 60747-5-2:2003 IEC/EN 60950-1	UL, VDE
	Fairchild Semiconductor Corp	H11A817	di = 0.6 mm, ext. dcr = 7.0 mm, Thermal cycling test. 5000 Vac, 100 °C	IEC/DIN EN 60747-5-2:2003 IEC/EN 60950-1	UL, VDE
	Everlight Electronics Co Ltd	EL817	di = 0.5 mm, int. dcr = 6.0 mm, ext. dcr = 7.7 mm, 5000 Vac, 100 °C	IEC/DIN EN 60747-5-2:2003 IEC/EN 60950-1	UL, VDE
Line Filter (LF1) (Optional) For models: 85470, 85417, 85475, 85418, 85670, 85419, 85570, 85433	Channel Well Technology Co., Ltd. (Data Well Electronics Co Ltd)	T16x9x5	130°C	--	--

EN 61347-2-13					
Clause	Requirement + Test			Result - Remark	Verdict
Line Filter (LF1) (Optional) For models: 85471, 85415, 85476, 85416, 85770, 85422, 85870, 85421, 85970, 85420	Channel Well Technology Co., Ltd. (Data Well Electronics Co Ltd)	T10x6x5	130°C	--	--
Line Filter (LF2) (Optional) For models: 85471, 85415, 85476, 85416, 85770, 85422, 85870, 85421, 85970, 85420	Channel Well Technology Co., Ltd. (Data Well Electronics Co Ltd)	T18x10x7	130°C	--	--
Varistor (ZNR1) (Optional)	Thinking	TVR10561-D	350Vac,450Vdc. 40/85/56 6KV/3KA pulse test passed	IEC/EN 61051-1, IEC/EN 61051-2, UL 1449	UL
	Thinking	TVR10511-D	320Vac,410Vdc. 40/85/56 6KV/3KA pulse test passed	IEC/EN 61051-1, IEC/EN 61051-2, UL 1449	UL
	Thinking	TVR10471-D	300Vac,385Vdc. 40/85/56 6KV/3KA pulse test passed	IEC/EN 61051-1, IEC/EN 61051-2, UL 1449	UL
	Thinking	TVR10561-V	350Vac,450Vdc. 40/85/56 6KV/3KA pulse test passed	IEC/EN 61051-1, IEC/EN 61051-2, UL 1449	UL
	Thinking	TVR10511-V	320Vac,410Vdc. 40/85/56 6KV/3KA pulse test passed	IEC/EN 61051-1, IEC/EN 61051-2, UL 1449	UL
	Thinking	TVR10471-V	300Vac,385Vdc. 40/85/56 6KV/3KA pulse test passed	IEC/EN 61051-1, IEC/EN 61051-2, UL 1449	UL
	Success	SVR10D561Kxx xxH	350Vac,450Vdc. 40/85/56 6KV/3KA pulse test passed	IEC/EN 61051-1, IEC/EN 61051-2, UL 1449	UL
	Success	SVR10D511Kxx xxH	320Vac,410Vdc. 40/85/56 6KV/3KA pulse test passed	IEC/EN 61051-1, IEC/EN 61051-2, UL 1449	UL

EN 61347-2-13					
Clause	Requirement + Test			Result - Remark	Verdict
	Success	SVR10D471Kxx xxH	300Vac,385Vdc. 40/85/56 6KV/3KA pulse test passed	IEC/EN 61051-1, IEC/EN 61051-2, UL 1449	UL
Bridge diode (BD1) For models: 85470, 85417, 85475, 85418, 85670, 85419, 85570, 85433	various	various	Min. 2A, Min. 600V	--	--
Bridge diode (BD1) For models: 85471, 85415, 85476, 85416, 85770, 85422, 85870, 85421, 85970, 85420	various	various	Min. 4A, Min. 600V	--	--
Electrolytic Capacitor (C7) For models: 85470, 85417, 85475, 85418, 85670, 85419, 85570, 85433	Various	Electrolytic Type	47-82 μ F., 400V Min, 105 $^{\circ}$ C	---	---
Electrolytic Capacitor (C7) For models: 85471, 85415, 85476, 85416, 85770, 85422, 85870, 85421, 85970, 85420	Various	Electrolytic Type	100-150 μ F., 400V Min, 105 $^{\circ}$ C	---	---
Transistor (Q2) For models: 85470, 85417, 85475, 85418, 85670, 85419, 85570, 85433	--	--	Min. 8A, min. 600 V	--	--
Transistor (Q2) For models: 85471, 85415, 85476, 85416, 85770, 85422, 85870, 85421, 85970, 85420	--	--	Min. 10 A, min. 600 V	--	--

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Clause	Requirement + Test			Result - Remark	Verdict
Main Transformer (T1) For models: 85470, 85417	Channel Well Technology Co., Ltd.	RM8-F	Class B	Applicable parts in IEC/EN 61347 and acc. To IEC 60085	--
-Triple insulated wire used in T1	Great Leoflon Industrial Co Ltd	TRW(B)	130°C	IEC/EN 60950-1	VDE, UL
Main Transformer (T1) For models: 85475, 85418	Channel Well Technology Co., Ltd.	RM8-M	Class B	Applicable parts in IEC/EN 61347 and acc. To IEC 60085	--
-Triple insulated wire used in T1	Great Leoflon Industrial Co Ltd	TRW(B)	130°C	IEC/EN 60950-1	VDE, UL
Main Transformer (T1) For models: 85670, 85419	Channel Well Technology Co., Ltd.	RM8-Q	Class B	Applicable parts in IEC/EN 61347 and acc. To IEC 60085	--
-Triple insulated wire used in T1	Great Leoflon Industrial Co Ltd	TRW(B)	130°C	IEC/EN 60950-1	VDE, UL
Main Transformer (T1) For models: 85570, 85433	Channel Well Technology Co., Ltd.	RM8-R	Class B	Applicable parts in IEC/EN 61347 and acc. To IEC 60085	--
-Triple insulated wire used in T1	Great Leoflon Industrial Co Ltd	TRW(B)	130°C	IEC/EN 60950-1	VDE, UL
Main Transformer (T1) For models: 85471, 85415	Channel Well Technology Co., Ltd.	PQ-2620-12	Class B	Applicable parts in IEC/EN 61347 and acc. To IEC 60085	--
-Triple insulated wire used in T1	Great Leoflon Industrial Co Ltd	TRW(B)	130°C	IEC/EN 60950-1	VDE, UL
Main Transformer (T1) For models: 85476, 85416	Channel Well Technology Co., Ltd.	PQ-2620-17	Class B	Applicable parts in IEC/EN 61347 and acc. To IEC 60085	--
-Triple insulated wire used in T1	Great Leoflon Industrial Co Ltd	TRW(B)	130°C	IEC/EN 60950-1	VDE, UL
Main Transformer (T1) For models: 85770, 85422, 85870, 85421	Channel Well Technology Co., Ltd.	PQ-2620-36	Class B	Applicable parts in IEC/EN 61347 and acc. To IEC 60085	--

EN 61347-2-13					
Clause	Requirement + Test			Result - Remark	Verdict
-Triple insulated wire used in T1	Great Leoflon Industrial Co Ltd	TRW(B)	130°C	IEC/EN 60950-1	VDE, UL
Main Transformer (T1) For models: 85970, 85420	Channel Well Technology Co., Ltd.	PQ-2620-48	Class B	Applicable parts in IEC/EN 61347 and acc. To IEC 60085	--
-Triple insulated wire used in T1	Great Leoflon Industrial Co Ltd	TRW(B)	130°C	IEC/EN 60950-1	VDE, UL
Supplementary information:					
<ol style="list-style-type: none"> 1. Provided evidence ensures the agreed level of compliance. See OD-CB2039. 2. In Optical Isolator technical data column, where “di” means distance through insulation, “int. dcr” means internal creepage distance, “ext. dcr” means external creepage distance. 					

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Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX 2: screw terminals (part of the controlgear)		N/A
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(14)	SCREW TERMINALS		N/A
(14.2)	Type of terminal		—
	Rated current (A).....		—
(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 (mm ²)		N/A
(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) ..		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

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Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX 3: screwless terminals (part of the controlgear)		N/A
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(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
(15.3.10)	Conductor size		N/A
	Type of conductor		N/A
(15.5.1)	Terminals internal wiring		N/A
(15.5.1.1)	Pull test spring-type terminals (4 N, 4 samples).....:		N/A
(15.5.1.2)	Pull test pin or tab terminals (4 N, 4 samples).....:		N/A
	Insertion force not exceeding 50 N		N/A
(15.5.2)	Permanent connections: pull-off test (20 N)		N/A
(15.6)	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
(15.7)	Terminals external wiring		N/A
	Terminal size and rating		N/A

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Clause	Requirement + Test										Result - Remark	Verdict
(15.8.1)	Pull test spring-type terminals or welded connections (4 samples); pull (N)											N/A
	Pull test pin or tab terminals (4 samples); pull (N)											N/A
(15.9)	Contact resistance test											N/A
	Voltage drop (mV) after 1 h											N/A
terminal	1	2	3	4	5	6	7	8	9	10		
voltage drop (mV)	--	--	--	--	--	--	--	--	--	--	--	
	Voltage drop of two inseparable joints											
	Voltage drop after 10th alt. 25th cycle											
	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											
	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											
	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											
	Max. allowed voltage drop (mV)											—
terminal	1	2	3	4	5	6	7	8	9	10		
voltage drop (mV)	--	--	--	--	--	--	--	--	--	--	--	

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Clause	Requirement + Test	Result - Remark	Verdict

12 (12)	TABLE: Electric strength tests			P
Test voltage applied between:		Voltage shape (AC, DC)	Test voltage (V)	Breakdown Yes / No
Basic / supplementary:				
Between live parts of different polarity		AC	1875	No
Double / reinforced:				
Between input circuits and output circuits		AC	3750	No
Between input circuits and enclosure		AC	3750	No
Supplementary information: Tested on models 85470 and 85471				

15.1/1.6	TABLE: Thermal requirements under normal operation			P
	Supply voltage (V)	See below.		—
Tested part and location of sensor:		Temperature rise (K)		Limit (K)
Input condition		94V Ambient:40°C	255V Ambient:40°C	--
For model : 85471 (Output: 12V / 5A)				
1. LF1 coil		28.4	19.6	90
2. CX1 body		38.9	27.3	60
3. LF2 coil		49.5	34.6	90
4. PCB near HS1		47.3	34.0	65
5. C7 body		50.7	40.7	65
6. T1 coil		55.0	49.7	80
7. T1 core		51.7	46.7	80
8. U3 body		49.1	44.9	60
9. PCB near HS2		43.8	34.8	65
10. C4 body		49.0	45.4	65
11. CY1 body		40.7	37.9	85
12. L1 coil		37.5	34.9	65
13. Enclosure inside		47.0	44.2	--
14. Enclosure outside (tc point)		39.1	37.0	40 (tc=80°C)
For model : 85470 (Output: 12V / 3A)				
1. CX1 body		25.7	14.6	60
2. LF1 coil		33.3	18.5	90
3. C7 body		33.7	26.5	65
4. PCB near HS1		37.8	35.0	65
5. T1 coil		45.4	46.9	80

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Clause	Requirement + Test	Result - Remark	Verdict
6. T1 core		43.1 44.6	80
7. U3 body		33.7 33.6	60
8. CY1 body		46.2 47.1	65
9. PCB near HS2		40.7 41.6	65
10. C3 body		42.2 43.1	85
11. L1 coil		35.6 36.2	65
12. Enclosure inside		38.8 39.1	--
13. Enclosure outside (tc point)		29.5 30.4	40 (tc=80°C)
Supplementary information:			

15.2	TABLE: Thermal requirements under abnormal operation		P
	Supply voltage (V)	See below	—
Tested part and location of sensor:		Temperature rise (K)	Limit (K)
Supplementary information:			
1. Tested on model 85471.			
2. No temp. rise occurred after no output load condition.			
3. Unit shut down after double output load condition.			
4. Unit shut down after shorted output condition.			

18 (16)a	TABLE: creepage distances and clearances						P
clearance cl and creepage distance cr at/of:	Up (V)	U r.m.s. (V)	required cl (mm)	Cl (mm)	required cr (mm)	Cr (mm)	
For models 85471, 85415, 85476, 85416, 85770, 85422, 85870, 85421, 85970, 85420							
Distance before fuse	420	250	3.0	See below	3.0	See below	
- Line trace to Neutral trace	420	250	3.0	4.5	3.0	4.5	
- under fuse	420	250	3.0	3.0	3.0	3.0	
Primary components (with 2 N) to plastic enclosure outside	420	250	6.0	More than 8.0	6.0	More than 8.0	
Secondary components (with 2 N) to plastic enclosure outside	48	48	1.5	More than 8.0	2.0	More than 8.0	
Primary components (with 2 N) to secondary components (with 2 N)	420	250	6.0	See below	6.0	See below	
- T1 core to U3 secondary pin	420	250	6.0	7.0	6.0	7.0	
- T1 primary coil to C4	420	250	6.0	More than 8.0	6.0	More than 8.0	

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Clause	Requirement + Test			Result - Remark			Verdict
- CX1 to HS2	420	250	6.0	7.5	6.0	7.5	
Primary traces to secondary traces	420	250	6.0	See below	6.0	See below	
- under CY1	420	250	6.0	7.0	6.0	7.0	
- CY1 primary trace to T1 secondary trace	420	250	6.0	6.0	6.0	6.0	
- R19 trace to R33 trace	420	250	6.0	7.0	6.0	7.0	
- Under U3	420	250	6.0	6.0	6.0	6.0	
For models 85470, 85417, 85475, 85418, 85670, 85419, 85570, 85433							
Distance before fuse	420	250	3.0	See below	3.0	See below	
- Line trace to Neutral trace	420	250	3.0	More than 8.0	3.0	More than 8.0	
- under fuse	420	250	3.0	3.0	3.0	3.0	
Primary components (with 2 N) to plastic enclosure outside	420	250	6.0	More than 8.0	6.0	More than 8.0	
Secondary components (with 2 N) to plastic enclosure outside	48	48	1.5	More than 8.0	2.0	More than 8.0	
Primary components (with 2 N) to secondary components (with 2 N)	420	250	6.0	See below	6.0	See below	
- T1 core to U3 secondary pin	420	250	6.0	10.0	6.0	10.0	
- T1 primary coil to C3	420	250	6.0	More than 8.0	6.0	More than 8.0	
Primary traces to secondary traces	420	250	6.0	See below	6.0	See below	
- under CY1	420	250	6.0	7.0	6.0	7.0	
- CY1 primary trace to T1 secondary trace	420	250	6.0	6.0	6.0	6.0	
- D4 trace to R33 trace	420	250	6.0	6.0	6.0	6.0	
- R19 trace to R35 trace	420	250	6.0	6.0	6.0	6.0	
- Under U3	420	250	6.0	6.0	6.0	6.0	

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Clause	Requirement + Test	Result - Remark	Verdict

Supplementary information:			
1. The controlgear including slot on the PCB is filled with silicone molding resin inside completely.			
2. For models 85471, 85415, 85476, 85416, 85770, 85422, 85870, 85421, 85970, 85420			
a. One slot with dimension 1.5mm x 12.0mm located between CY1 primary trace and T1 secondary trace.			
b. Two layers of insulation tape wrapped around HS2 to keep the sufficient distance from primary components to secondary HS2. See photos for the construction.			
3. For models 85470, 85417, 85475, 85418, 85670, 85419, 85570, 85433.			
a. One slot with dimension 1.5mm x 8.0mm located under CY1.			
b. One slot with dimension 1.5mm x 9.0mm located under T1.			
4. For the clearances and creepage distances which were not described above are larger than the limit above.			

Transformer construction						
Transformer part name.....:		T1 for models 85471, 85415, 85476, 85416, 85770, 85422, 85870, 85421, 85970, 85420				
Manufacturer.....:		See appended table Components list				
Type.....:		See appended table Components list				
Clearance (cl) and creepage distance (cr) at/of/between:	U peak (V)	U r.m.s. (V)	Required cl (mm)	cl (mm)	Required cr (mm)	cr (mm)
Primary /input winding and secondary/output winding (internal)	536	280	6.4	Certified triple insulated wire used	6.4	Certified triple insulated wire used
Secondary/output winding and core (internal)			6.4	Certified triple insulated wire used	6.4	Certified triple insulated wire used
Primary/input part and secondary/output part (external)			6.4	7.0	6.4	7.0
Secondary/output part and core (external)			6.4	7.0	6.4	7.0
Secondary/output part and primary/input winding (external)			6.4	6.5	6.4	6.5
Description of design:						
(a) Bobbin						
Primary/input pins.....:		4-1, 3-5-6				
Secondary/output pins.....:		8/9-10/11				
Material (manufacturer, type, ratings).....:		Chang Chun Plastics Co., Ltd., type T375J, Phenolic, V-0, 150 °C				

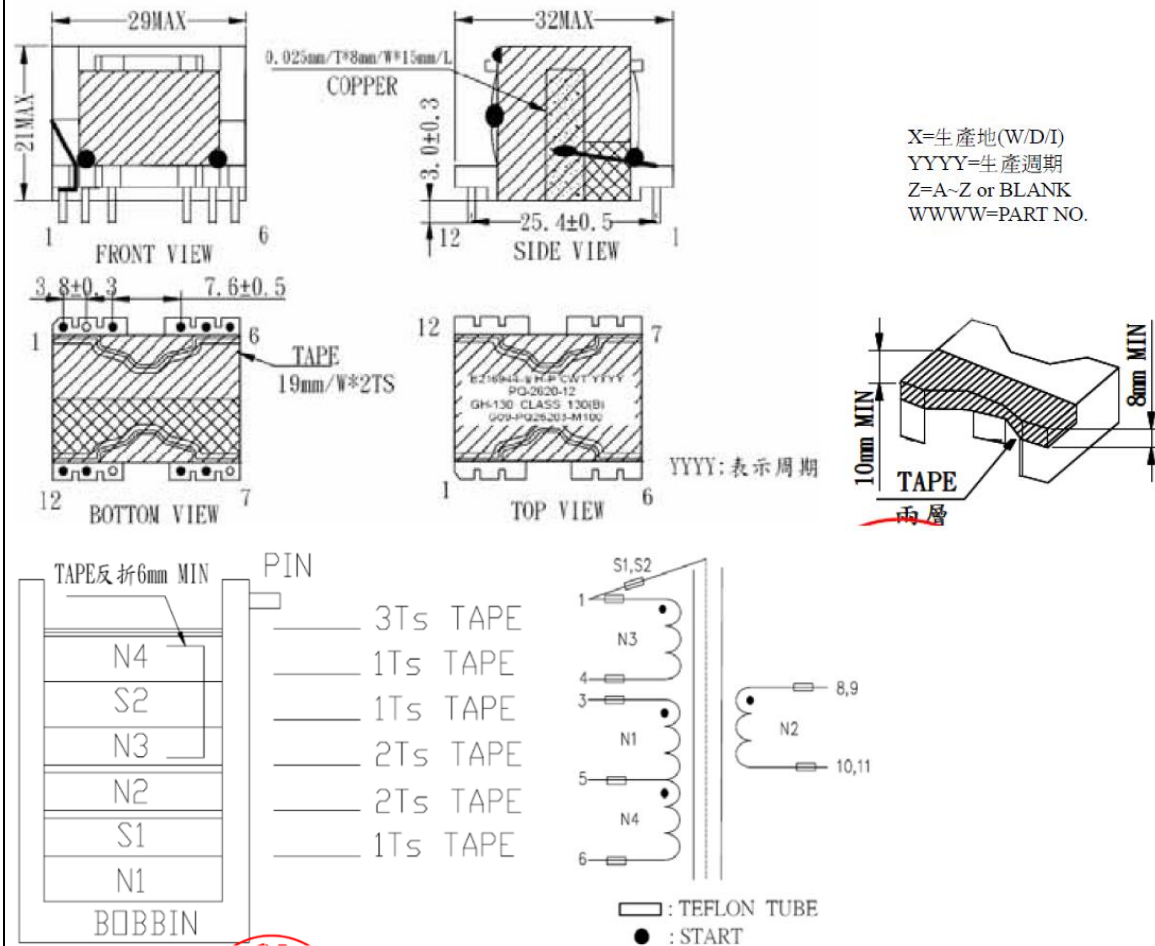
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Clause	Requirement + Test	Result - Remark	Verdict
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Thickness (mm)..... : Min. 1.0 mm

(b) General

1. MECHANICAL DIMENSIONS: (UNIT: mm)

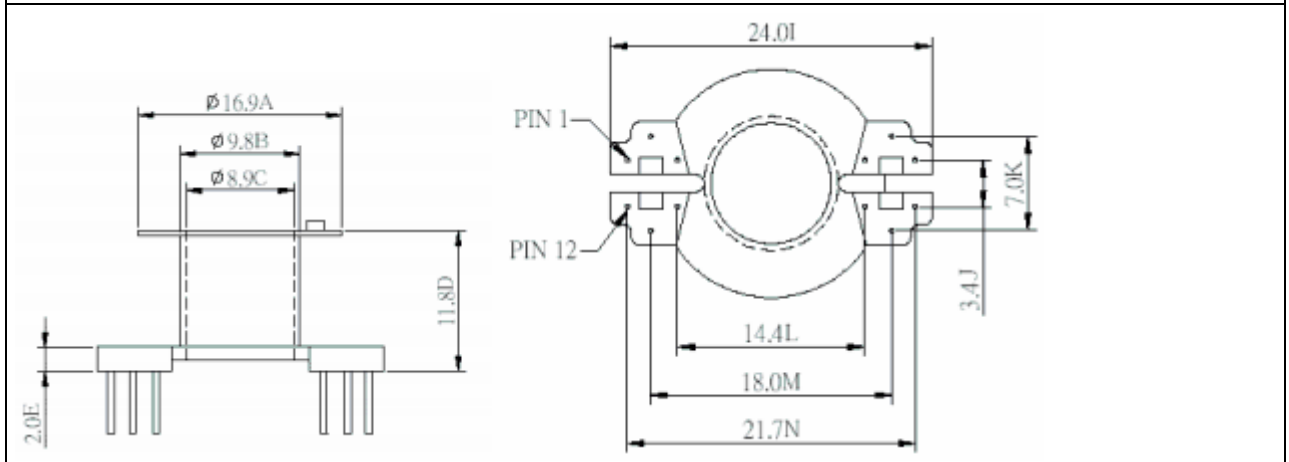


WINDING	WIRE SIZE	START	FINISH	TURNS	UL TAPE	MARGIN TAPE		SLEEVEING	NOTE
						PIN	TOP		
N1	Φ0.4mm*2 2UEW	3	5	20TS(ref.)	1TS	X	X	TFL	/
S1	0.025mm/T*8mm/W	1	/	1TS	2TS	X	X	TFL	引線為φ0.3
N2	TRW(B) φ0.5mm*2	9	11, 12	12TS(ref.)	2TS	X	X	TFL	/
N3	Φ0.16mm*2 2UEW	1	4	4TS(ref.)	1TS	X	X	TFL	/
S2	0.025mmT*8mm/W	1	/	1TS	1TS	X	X	TFL	引線為Ø.3
N4	Φ0.4mm*2 2UEW	5	6	20TS(ref.)	3TS	X	X	TFL	/

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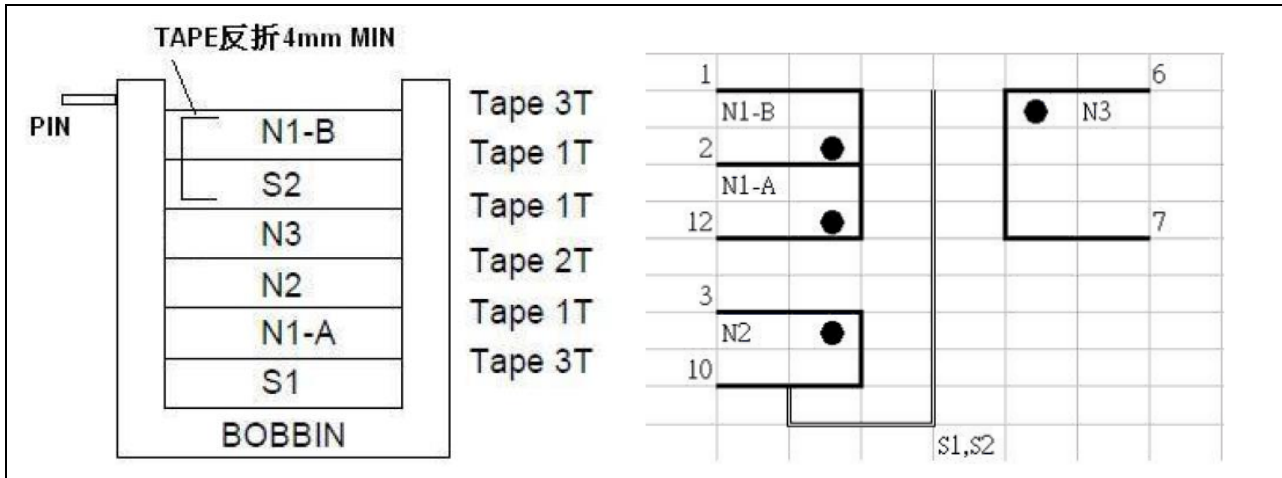
Clause	Requirement + Test	Result - Remark	Verdict
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Transformer construction						
Transformer part name.....:		T1 for models 85470, 85417, 85475, 85418, 85670, 85419, 85570, 85433				
Manufacturer.....:		See appended table Components list				
Type.....:		See appended table Components list				
Clearance (cl) and creepage distance (cr) at/of/between:	U peak (V)	U r.m.s. (V)	Required cl (mm)	cl (mm)	Required cr (mm)	cr (mm)
Primary /input winding and secondary/output winding (internal)	536	280	6.4	Certified triple insulated wire used	6.4	Certified triple insulated wire used
Secondary/output winding and core (internal)			6.4	Certified triple insulated wire used	6.4	Certified triple insulated wire used
Primary/input part and secondary/output part (external)			6.4	7.0	6.4	7.0
Secondary/output part and core (external)			6.4	6.4	6.4	6.4
Secondary/output part and primary/input winding (external)			6.4	8.0	6.4	8.0
Description of design:						
(a) Bobbin						
Primary/input pins.....:		1-2-12, 3-10				
Secondary/output pins.....:		6-7				
Material (manufacturer, type, ratings).....:		Chang Chun Plastics Co., Ltd., type T375J, Phenolic, V-0, 150 °C				
Thickness (mm).....:		Min. 1.0 mm				
(b) General						



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Clause	Requirement + Test	Result - Remark	Verdict
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WINDING	WIRE SIZE	START	FINISH	TURNS	MYLAR TAPE	TUBE	NOTE
S1	Φ0.15*3 2UEW or 0.025mmT*8mmW	10	/	17.5TS(RFF) or 0.9TS(RFF)	1TS	/	密繞
N1-A	Φ0.4 2UEW	12	2	40TS(RFF)	1TS	/	密繞
N2	Φ0.2 2UEW	3	10	12TS(RFF)	1TS	/	疏繞
N3	Φ0.7 TRW(B)	6	7	9TS(RFF)	1TS	/	密繞
S2	0.025mmT*8mmW	10	/	0.9TS(RFF)	1TS	/	銅箔需包膠引線為Φ0.2
N1-B	Φ0.4 2UEW	2	1	20TS(RFF)	3TS		密繞

I.7.3 TABLE: Short-circuit and overload protection					P
Part	Simulated fault				Hazard Yes / No
--	Fault condition	Result			--
--	--	Time	Input current during fault	Observation	--
Tested on model 85470, Input condition: 264Vac / 60Hz					
Output	o-l	4 hrs	0.47	Temp. was stable at load: 3.6 A, Unit cycle protection at load: 3.64 A, T1 coil: 91.3K, Ambient: 40.1°C	No
Output	s-c	10 mins	0.03 to 0.09	Unit cycle protection	No
Tested on model 85471, Input condition: 264Vac / 60Hz					
Output	o-l	4 hrs	0.66	Temp. was stable at load: 5.1 A, Unit cycle protection at load: 5.142 A, T1 coil: 93.7K, Ambient: 51.7°C	No
Output	s-c	10 mins	0.04 to 0.06	Unit cycle protection	No

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Clause	Requirement + Test	Result - Remark	Verdict
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Supplementary information:

1. In fault condition column: s-c=short-circuited, o-l=overloaded.

Working voltage measurement				P
Location	RMS voltage (V)	Peak voltage (V)	Comments	
Model 85970				
T1 pin 1 to pin 8,9	195	344	Max. Normal load.	
T1 pin 1 to pin 10,12	206	392	Max. Normal load.	
T1 pin 3 to pin 8,9	175	328	Max. Normal load.	
T1 pin 3 to pin 11,12	192	444	Max. Normal load.	
T1 pin 4 to pin 8,9	193	376	Max. Normal load.	
T1 pin 4 to pin 11,12	200	376	Max. Normal load.	
T1 pin 6 to pin 8,9	280	512	Max. Normal load.	
T1 pin 6 to pin 11,12	225	472	Max. Normal load.	
T1 pin 1 to R33	206	368	Max. Normal load.	
U3, pin 3 to pin 1	222	384	Max. Normal load.	
U3, pin 3 to pin 2	222	392	Max. Normal load.	
U3, pin 4 to pin 1	220	384	Max. Normal load.	
U3, pin 4 to pin 2	220	376	Max. Normal load.	
CY1 P to S	206	368	Max. Normal load.	
Model 85570				
T1 pin 12 to pin 7	200	392	Max. Normal load.	
T1 pin 12 to pin 6	243	504	Max. Normal load.	
Model: 85770				
T1 pin 1 to pin 8,9	204	368	Max. Normal load.	
T1 pin 1 to pin 10,12	203	408	Max. Normal load.	
T1 pin 3 to pin 8,9	165	320	Max. Normal load.	
T1 pin 3 to pin 11,12	175	400	Max. Normal load.	
T1 pin 4 to pin 8,9	205	392	Max. Normal load.	
T1 pin 4 to pin 11,12	208	384	Max. Normal load.	
T1 pin 6 to pin 8,9	276	536	Max. Normal load.	
T1 pin 6 to pin 11,12	240	496	Max. Normal load.	
T1 pin 1 to R33	202	368	Max. Normal load.	
U3, pin 3 to pin 1	210	376	Max. Normal load.	

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Clause	Requirement + Test	Result - Remark	Verdict
U3, pin 3 to pin 2	210	376	Max. Normal load.
U3, pin 4 to pin 1	205	376	Max. Normal load.
U3, pin 4 to pin 2	208	376	Max. Normal load.
CY1 P to S	202	368	Max. Normal load.
Model: 85670			
T1 pin 12 to pin 7	215	440	Max. Normal load.
T1 pin 12 to pin 6	242	520	Max. Normal load.
Supplementary information: 1. Input condition: 240 Vac, 60 Hz			

TABLE: Electrical data (in normal conditions)							P
U (V) / F (Hz)	I (A)	Irated (A)	P (W)	Fuse #	Ifuse (A)	Condition/status	
Model: 85970							
90V/50Hz	1.23	---	70.5	F1	1.23	Max. Normal load	
90V/60Hz	1.22	---	70.3	F1	1.22	Max. Normal load	
100V/50Hz	1.11	1.4	69.8	F1	1.11	Max. Normal load	
100V/60Hz	1.11	1.4	69.8	F1	1.11	Max. Normal load	
240V/50Hz	0.52	1.4	68.5	F1	0.52	Max. Normal load	
240V/60Hz	0.51	1.4	68.7	F1	0.51	Max. Normal load	
264V/50Hz	0.48	---	68.5	F1	0.48	Max. Normal load	
264V/60Hz	0.48	---	68.6	F1	0.48	Max. Normal load	
Model: 85570							
90V/50Hz	0.75	---	42.1	F1	0.75	Max. Normal load	
90V/60Hz	0.75	---	42.0	F1	0.75	Max. Normal load	
100V/50Hz	0.69	1.0	41.7	F1	0.69	Max. Normal load	
100V/60Hz	0.69	1.0	41.9	F1	0.69	Max. Normal load	
240V/50Hz	0.35	1.0	41.4	F1	0.35	Max. Normal load	
240V/60Hz	0.34	1.0	41.3	F1	0.34	Max. Normal load	
264V/50Hz	0.32	---	41.3	F1	0.32	Max. Normal load	
264V/60Hz	0.32	---	41.3	F1	0.32	Max. Normal load	
Model: 85770							
90V/50Hz	1.23	---	70.9	F1	1.23	Max. Normal load	
90V/60Hz	1.23	---	70.7	F1	1.23	Max. Normal load	
100V/50Hz	1.11	1.4	70.2	F1	1.11	Max. Normal load	

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Clause	Requirement + Test				Result - Remark	Verdict
100V/60Hz	1.11	1.4	70.0	F1	1.11	Max. Normal load
240V/50Hz	0.52	1.4	67.7	F1	0.52	Max. Normal load
240V/60Hz	0.51	1.4	68.0	F1	0.51	Max. Normal load
264V/50Hz	0.48	---	67.7	F1	0.48	Max. Normal load
264V/60Hz	0.48	---	67.8	F1	0.48	Max. Normal load
Model: 85670						
90V/50Hz	0.77	---	43.0	F1	0.77	Max. Normal load
90V/60Hz	0.77	---	43.0	F1	0.77	Max. Normal load
100V/50Hz	0.70	1.0	42.5	F1	0.70	Max. Normal load
100V/60Hz	0.70	1.0	42.6	F1	0.70	Max. Normal load
240V/50Hz	0.35	1.0	42.1	F1	0.35	Max. Normal load
240V/60Hz	0.34	1.0	41.7	F1	0.34	Max. Normal load
264V/50Hz	0.33	---	42.2	F1	0.33	Max. Normal load
264V/60Hz	0.33	---	42.1	F1	0.33	Max. Normal load
Model: 85471						
90V/50Hz	1.25	---	71.4	F1	1.25	Max. Normal load
90V/60Hz	1.25	---	71.1	F1	1.25	Max. Normal load
100V/50Hz	1.13	1.4	70.6	F1	1.13	Max. Normal load
100V/60Hz	1.14	1.4	70.3	F1	1.14	Max. Normal load
240V/50Hz	0.52	1.4	68.3	F1	0.52	Max. Normal load
240V/60Hz	0.52	1.4	68.3	F1	0.52	Max. Normal load
264V/50Hz	0.49	---	68.6	F1	0.49	Max. Normal load
264V/60Hz	0.48	---	68.6	F1	0.48	Max. Normal load
Model: 85470						
90V/50Hz	0.78	---	42.9	F1	0.78	Max. Normal load
90V/60Hz	0.78	---	42.8	F1	0.78	Max. Normal load
100V/50Hz	0.71	1.0	42.5	F1	0.71	Max. Normal load
100V/60Hz	0.71	1.0	42.4	F1	0.71	Max. Normal load
240V/50Hz	0.35	1.0	41.6	F1	0.35	Max. Normal load
240V/60Hz	0.35	1.0	41.6	F1	0.35	Max. Normal load
264V/50Hz	0.33	---	41.8	F1	0.33	Max. Normal load
264V/60Hz	0.33	---	41.8	F1	0.33	Max. Normal load

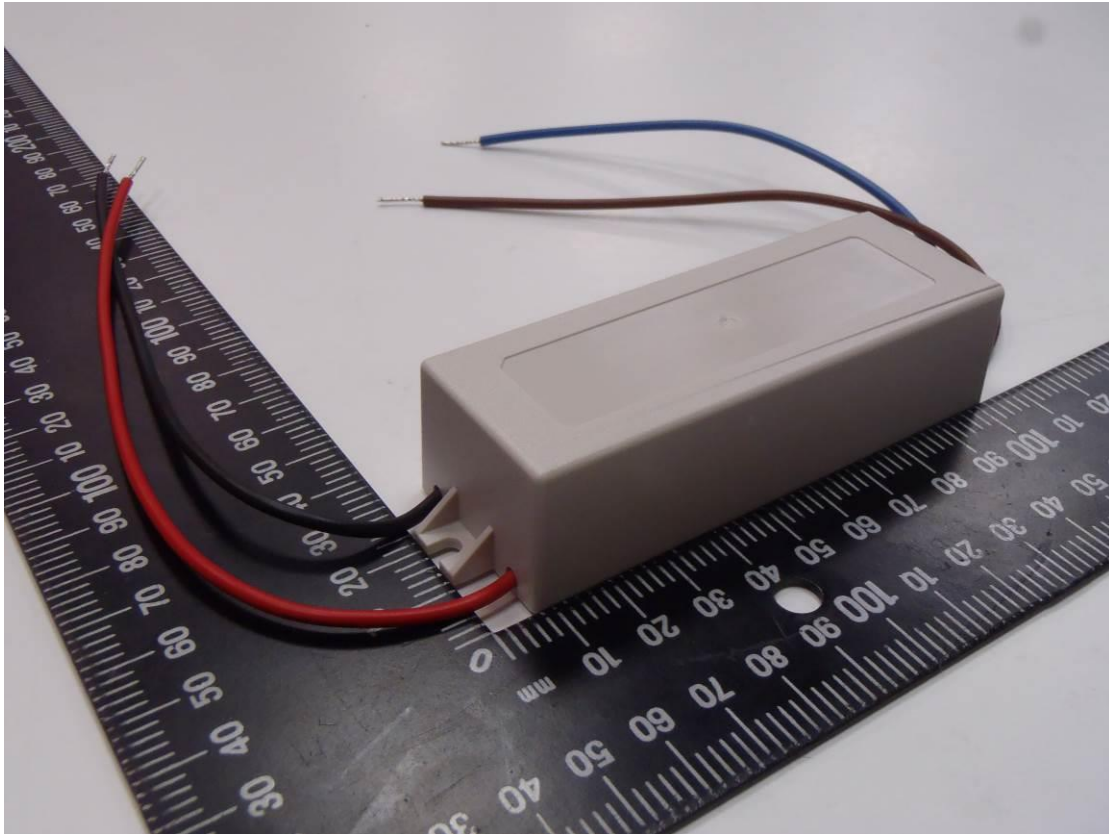
EN 61347-2-13			
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18 (16)	CREEPAGE DISTANCES AND CLEARANCES		P
	<p>Creepage distances and clearances according to Table 3 and 4, as appropriate</p> <p>NOTE Z1 Attention is drawn to the fact that the values for creepage distances and clearances given in this clause are the absolute minimum.</p> <p>NOTE Z2 The way in which creepage distances and clearances are measured is specified in EN 60664-1.</p>		P
	<p>Values for creepage distances and clearances may be found for intermediate values of working voltages by linear interpolation between tabulated values.</p> <p>NOTE Z3 For details of pollution degrees or overvoltage categories, EN 60664-1 should be consulted.</p> <p>The minimum distances specified are based on the following parameters:</p> <ul style="list-style-type: none"> - for use with up to 2 000 m above sea level; - pollution degree 2 where normally only non-conductive pollution occurs but occasionally a temporary conductivity caused by condensation is to be expected; - equipment of impulse withstand category II which is energy-consuming equipment to be supplied from the fixed insulation. 		P

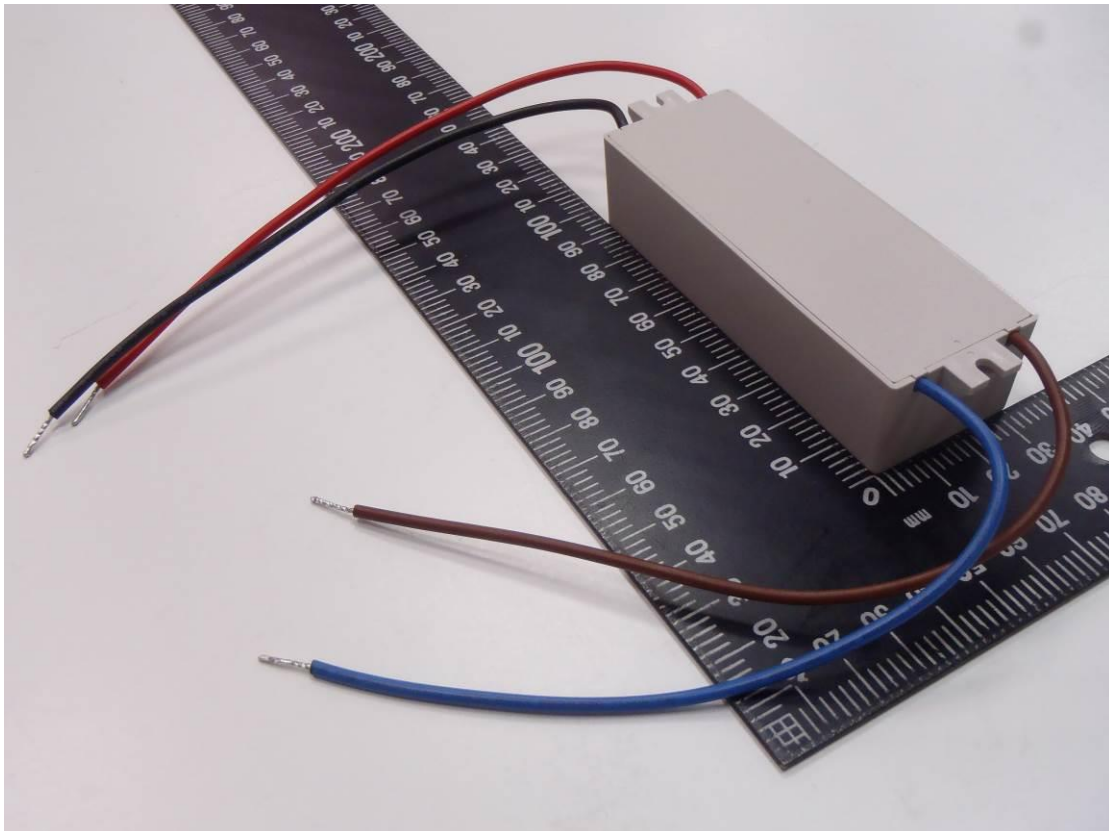
18 (16)	TABLE: creepage distances and clearances						P
	Minimum distances for a.c. (50/60 Hz) sinusoidal voltages						
	RMS working voltage (V) not exceeding	50	150	250	500	750	1000
1	minimum distances between live parts of different polarity. Specify the value measured.	N/A	N/A	See append table 18(16)a	N/A	N/A	N/A
2	minimum distances between live parts and accessible parts which are permanently fixed to the ballast, including screws or devices for fixing covers or fixing the ballast to its support. Specify the value measured.	N/A	N/A	See append table 18(16)a	N/A	N/A	N/A
	- required creepage distances (mm), Basic insulation PTI ≥ 600	0,6	0,8	1,5	3	4	5,5
	- required creepage distances (mm), Basic insulation PTI < 600	1,2	1,6	2,5	5	8	10
	- required creepage distances (mm), Supplementary insulation PTI ≥ 600	--	0,8	1,5	3	4	5,5
	- required creepage distances (mm), Supplementary insulation PTI < 600	--	1,6	2,5	5	8	10

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Clause	Requirement + Test	Result - Remark				Verdict	
	- required creepage distances (mm), Reinforced insulation	--	3.2	5	6	8	11
	- required clearances (mm), Basic insulation	0.2	0.8	1,5	3	4	5.5
	- required clearances (mm), Supplementary insulation	--	0.8	1,5	3	4	5,5
	- required clearances (mm), Reinforced insulation	--	1,6	3	6	8	11

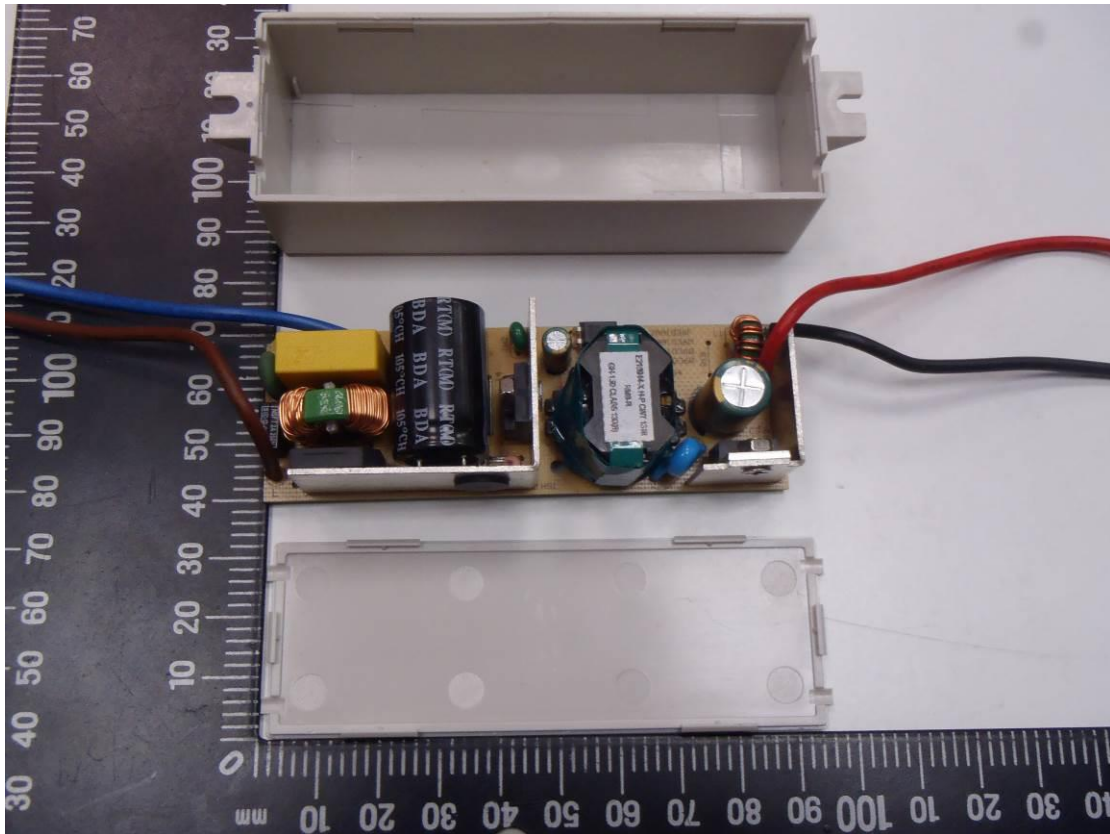
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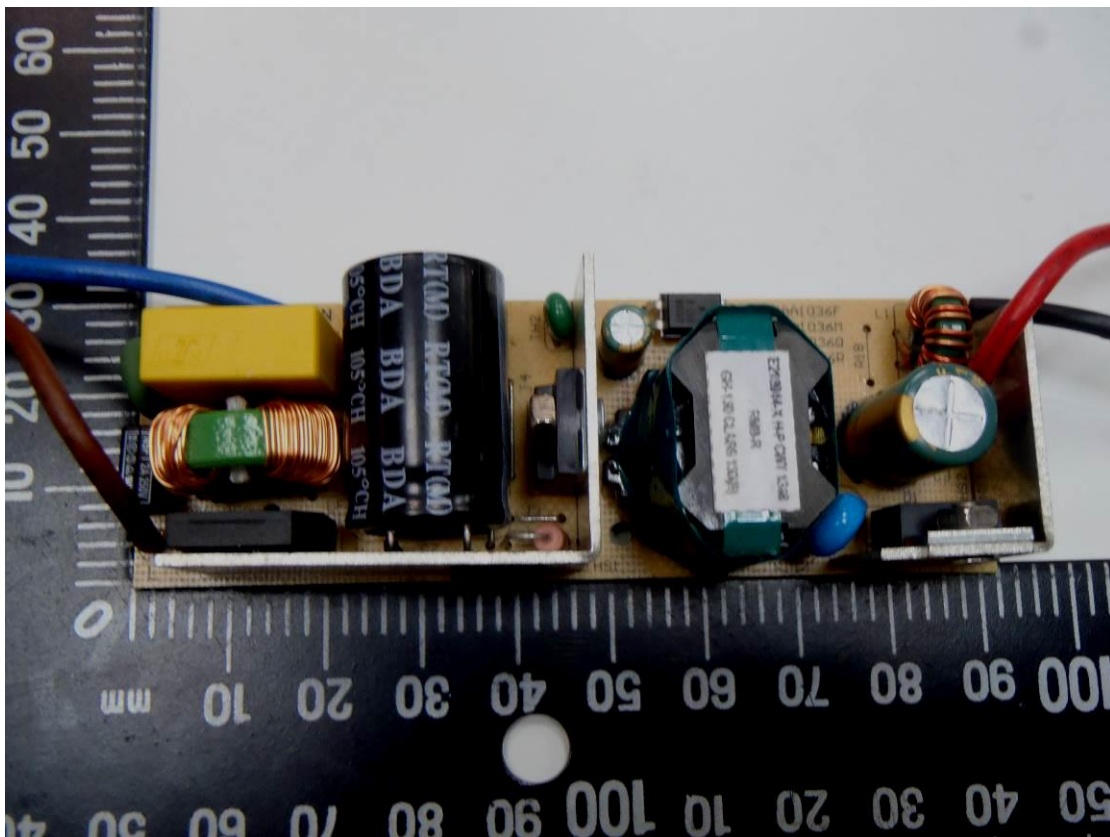
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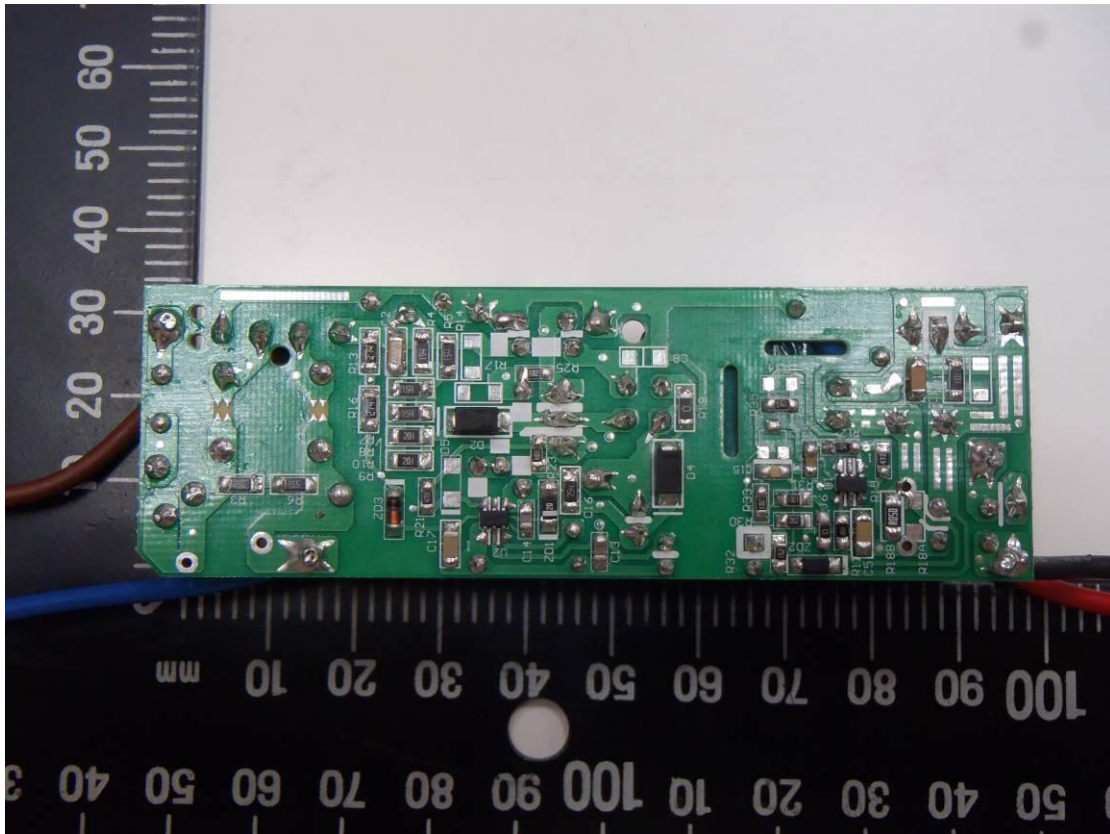
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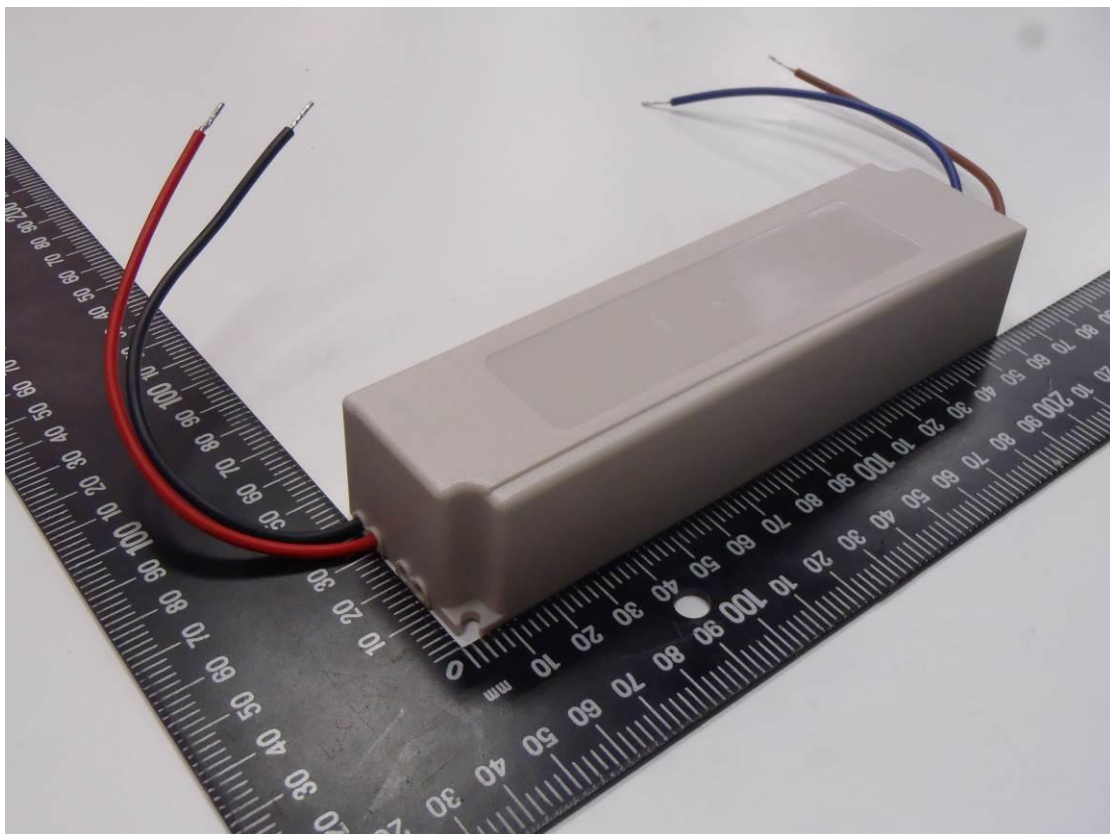
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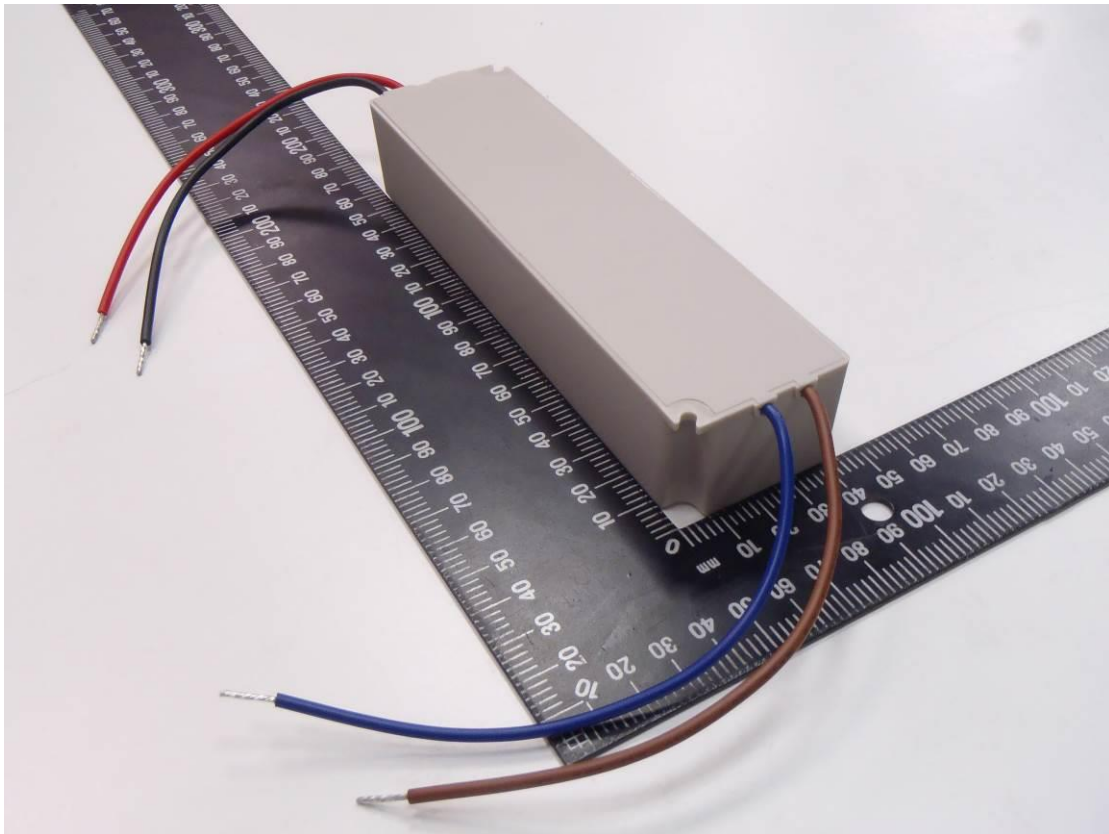
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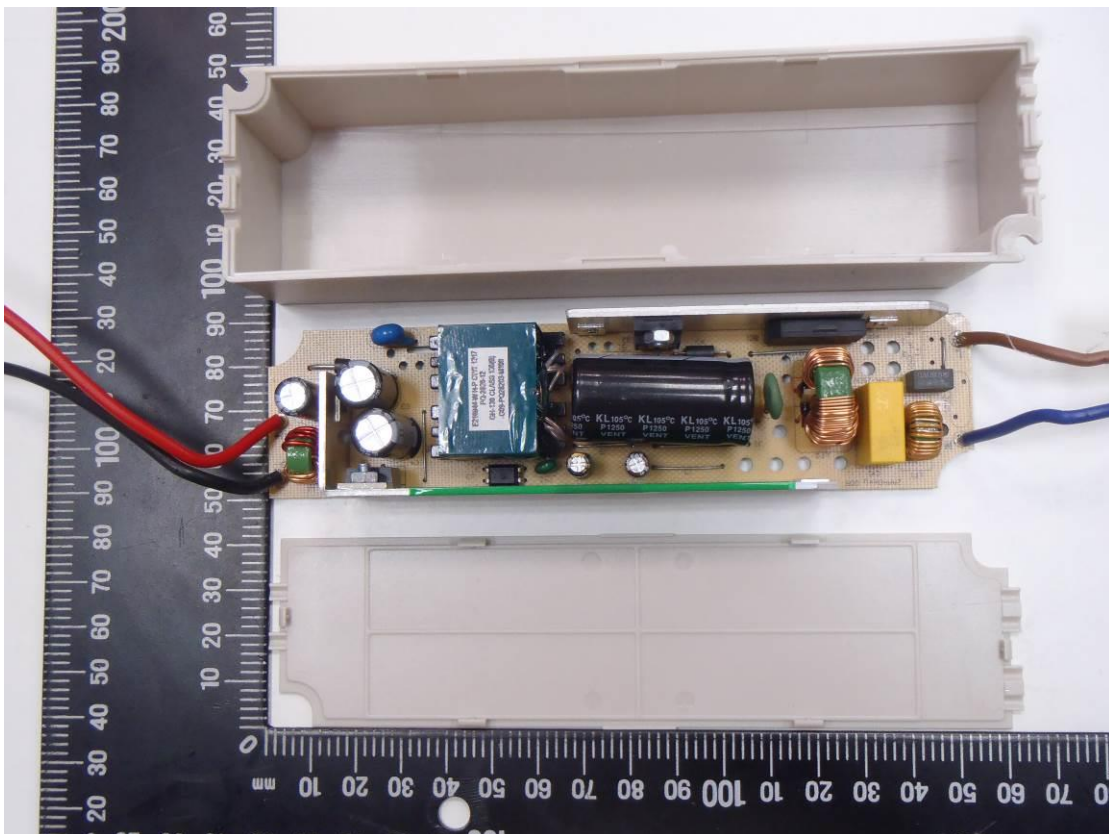
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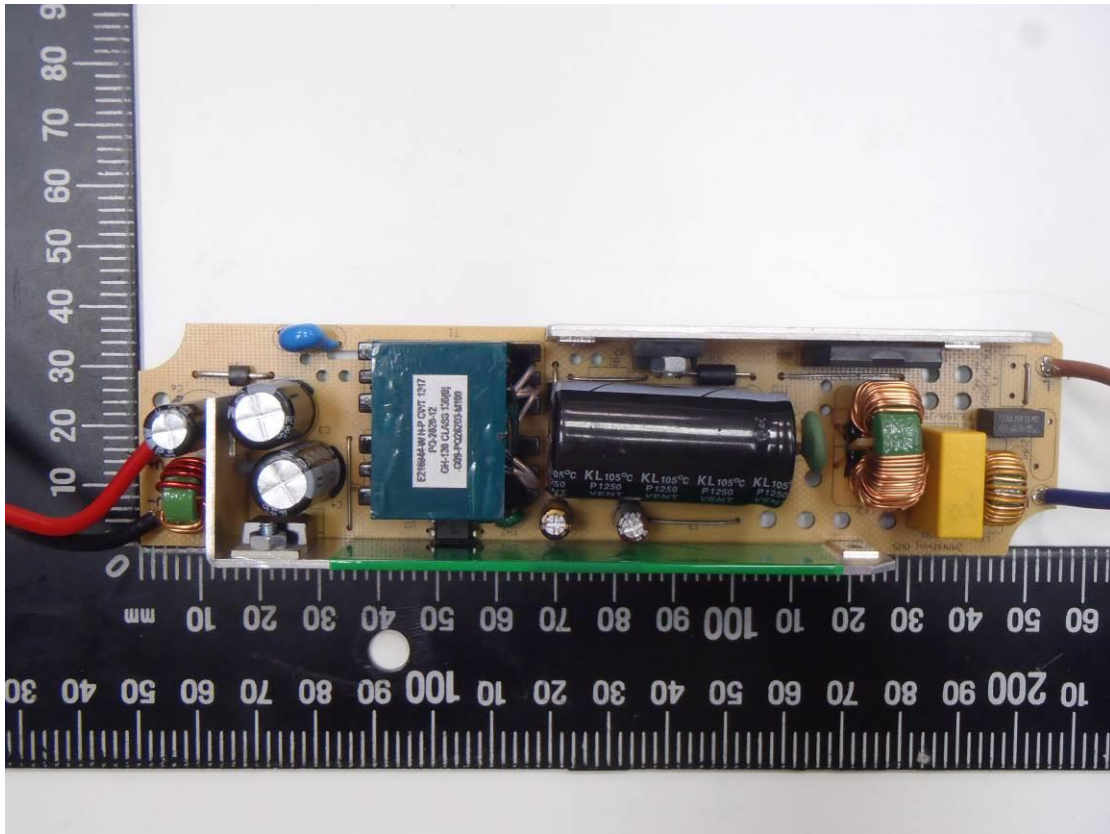
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Model no.: 85471, 85415, 85476, 85416, 85770, 85422, 85870, 85421, 85970, 85420



Model no.: 85471, 85415, 85476, 85416, 85770, 85422, 85870, 85421, 85970, 85420



Model no.: 85471, 85415, 85476, 85416, 85770, 85422, 85870, 85421, 85970, 85420

