


Test Report Number:	LCZS17010066	
Applicant Name:	Energy Recovery Products (Zhuhai) Co., Ltd	
Applicant Address:	F building No.8,Pingdong Road 2, Nanping Science Park, Zhuhai, Guangdong China 519060	
Test item:	LED driver	
Model / Type Reference:	See the model list on page 3 for details	
Date of Issue:	2017-03-20	
Testing Laboratory:	LCTECH (Zhongshan) Testing Service Co.,Ltd. 2/F.,Technology and Enterprise Development Center, Guangyuan Road, Xiaolan, Zhongshan, Guangdong, China	
Test Specification:	EN 61347-2-13:2014 EN 61347-1:2008+A1:2011+A2:2013	
Test Result:	Passed	
Compiled by:	Reviewed by:	
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>2017-03-20 Kira Ling <i>Kira Ling</i></p> <hr/> <p><small>Date Name Signature</small></p> </div> <div style="text-align: center;"> <p>2017-03-20 Tension Li <i>Tension Li</i></p> <hr/> <p><small>Date Name Signature</small></p> </div> </div>		
Remark:	N/A	
<p>The duplication of this report or parts of it and its use for advertising purposes is only allowed with permission of the testing laboratory. This report contains the result of the examination of the product sample submitted by the applicant. A general statement concerning the quality of the products from the series manufacture cannot be derived therefore.</p>		

Test item description: LED driver	
Trade Mark.....:	
Manufacturer.....: Energy Recovery Products (Zhuhai) Co., Ltd	
Model/Type reference.....: See the model list	
Ratings.....: Input: 220-240V~ 50Hz; IP20; tc:90 °C	
Test item particulars	
Protection against electric shock.....: SELV controlgear	
Classification of installation and use.....: Built-in controlgear	
Supply connection.....: Connecting leads	
Output type.....: Constant current controlgear	
Possible test case verdicts:	
- test case does not apply to the test object.....: N/A (not applicable)	
- test object does meet the requirement.....: P (Pass)	
- test object does not meet the requirement.....: F (Fail)	
Testing	
Date of receipt of test item.....: 2017-01-17	
Date (s) of performance of tests.....: 2017-02-03 to 2017-02-17	
General remarks:	
<p>The test results presented in this report relate only to the object tested.</p> <p>This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.</p> <p>"(See Enclosure #)" refers to additional information appended to the report.</p> <p>"(See appended table)" refers to a table appended to the report.</p> <p>Throughout this report a comma (point) is used as the decimal separator.</p> <p>Clause numbers between brackets refer to clauses in EN 61347-2-13:2014</p> <p>When determining of test conclusion, measurement uncertainty of test has been considered.</p>	
General product information:	
<p>The models are built-in constant current LED driver, usually called LED power supply, for LED modules and indoor use only.</p> <p>All the models are similar circuit diagram and PCB layout except the value of component are different.</p>	

Model list						
Model	Input voltage (VAC)	Output Voltage (VDC)	Output Current (mA)	Max. rated output power(W)	No Load Voltage (VDC)	TC (°C)
EBR010E-0170-42 -YYYYY-ZZZZZ	220-240	30-42	170	7.14	50	90
EBR010E-0200-42 -YYYYY-ZZZZZ	220-240	30-42	200	8.4	50	90
EBR010E-0250-42 -YYYYY-ZZZZZ	220-240	30-42	250	10.5	50	90
EBR010E-0440-24 -YYYYY-ZZZZZ	220-240	16-24	440	10.56	31	90
EBR015E-0285-42 -YYYYY-ZZZZZ	220-240	30-42	285	11.97	50	90
EBR015E-0350-32 -YYYYY-ZZZZZ	220-240	21-32	350	11.2	42	90
EBR015E-0350-42 -YYYYY-ZZZZZ	220-240	30-42	350	14.7	50	90
EBR015E-0300-42 -YYYYY-ZZZZZ	220-240	30-42	300	12.6	50	90
EBR015E-0350-42 -YYYYY-ZZZZZ	220-240	30-42	350	14.7	50	90
EBR015E-0440-36 -YYYYY-ZZZZZ	220-240	24-36	440	15.84	47	90
EBR020E-0380-42 -YYYYY-ZZZZZ	220-240	30-42	380	15.96	50	90
EBR020E-0400-42 -YYYYY-ZZZZZ	220-240	30-42	400	16.8	50	90
EBR020E-0500-32 -YYYYY-ZZZZZ	220-240	21-32	500	16	42	90
EBR020E-0500-37 -YYYYY-ZZZZZ	220-240	25-37	500	18.5	48	90
EBR020E-0500-42 -YYYYY-ZZZZZ	220-240	30-42	500	21	50	90
EBR020E-0700-24 -YYYYY-ZZZZZ	220-240	16-24	700	16.8	31	90
EBR020E-0700-30 -YYYYY-ZZZZZ	220-240	20-30	700	21	38	90

EBR0PPE-XXXX-VV-YYYYY-ZZZZZ:

PP represented the output power. can be 10, 15 or 20. The 10 denotes 10W. The 15 denotes 15W. The 20 denotes 20W.

XXXX represented the output current. can be 0170, 0200, 0250, 0285, 0300, 0350, 0440, 0500, 0700.

The 0170 denotes 170mA. The 0200 denotes 200mA. The 0250 denotes 250mA. The 0280 denotes 280mA. The 0300 denotes 300mA. The 0350 denotes 350mA. The 0440 denotes 440mA. The 0500 denotes 500mA. The 0700 denotes 700mA.

VV represented the output voltage. can be 24, 30, 32, 36, 37, 42. The 24 denotes 24Vdc. The 30 denotes 30Vdc. The 32 denotes 32Vdc. The 36 denotes 36Vdc. The 37 denotes 37Vdc. The 42 denotes 42Vdc.

YYYYY represented the different customers. Y can be 0~9, A~Z or blank.

ZZZZZ represented the different customers. Z can be 0~9, A~Z or blank.

General remark for test:

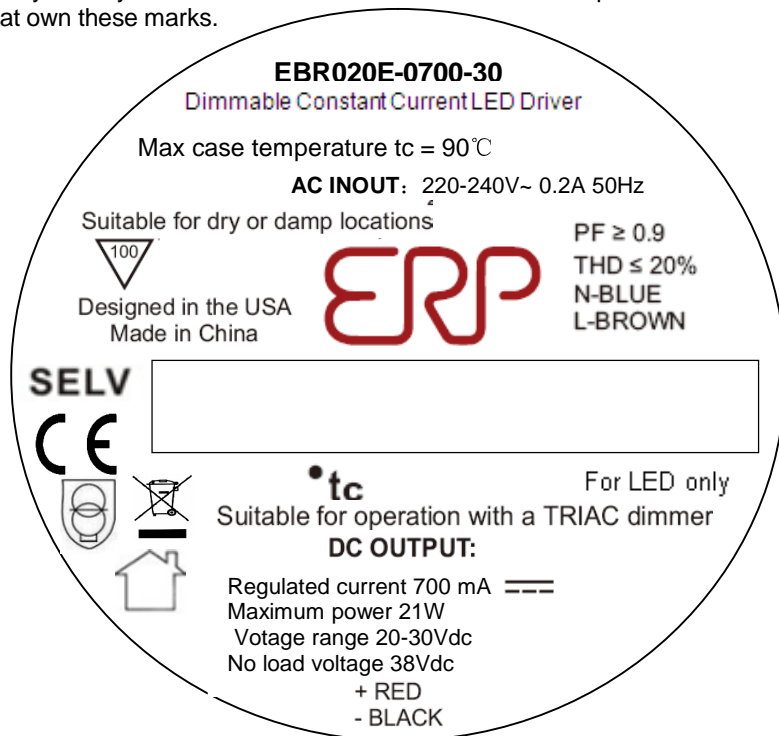
The model EBR020E-0700-30 was chosen as representative model to perform all tests.

The models were found to comply with the standard:

- EN 61347-2-13:2014
- EN 61347-1:2008+A1:2011+A2:2013

Copy of marking plate:

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



All the models' marking labels are same as above except the model name, power, Output parameter.

1. The height of graphical symbols shall be not less than 5mm.
2. The height of letters and numerals shall be not less than 2mm.

EN 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

4 (4)	GENERAL REQUIREMENTS		—
- (4)	<u>Insulation materials</u> according requirements in Annex N of IEC 61347-1	(see Annex N)	P
- (4)	Compliance of <u>independent controlgear enclosure</u> with IEC 60 598-1		N/A
- (4)	<u>Built-in magnetic ballast</u> with double or reinforced insulation comply with Annex I of IEC 61347-1		N/A
- (4)	<u>Built-in electronic controlgear</u> with double or reinforced insulation comply with Annex O of IEC 61347-1	(see Annex O)	P
4 (4)	<u>SELV controlgear</u> 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		—
	Built-in controlgear	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	Independent controlgear	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Integral controlgear	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
6 (-)	Auto-wound controlgear	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Separating controlgear	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Isolating controlgear	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	SELV controlgear	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—

7 (7)	MARKING		—
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		N/A
	d) correlation between interchangeable parts and controlgear marked	No such parts	N/A
	e) rated supply voltage (V)	220-240V	P

EN 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	supply frequency (Hz)	50Hz	P
	supply current (A)		P
	f) earthing symbol	Class II construction	N/A
	k) wiring diagram	On the marking label	P
	l) value of t_c	See the marking	P
	m) symbol for declared temperature	See the marking	P
7.1 (-)	Constant voltage type:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	- rated output power P_{rated} (W)		N/A
	- rated output voltage U_{rated} (V)		N/A
	Constant current type:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	- rated output power P_{rated} (W)	See the marking	P
	- rated output current I_{rated} (A)	See the marking	P
	Indication if for LED modules only	See the marking	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 on protection against accidental contact		N/A
	i) cross-section of conductors (mm ²)		N/A
	j) number, type and wattage of lamp(s)	Suitable for use together with LED modules only	P
	s) SELV symbol		P
7.2 (-)	- declaration of mains connected windings		N/A

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

EN 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Adequate mechanical strength on parts providing protection		P
- (10.2)	Capacitors > 0,5 μ F: voltage after 1 min (V): < 50 V	Max.4,7V	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		P
	No possibility of connection between output circuit and the body or protective earthing circuit through other conductive parts		P
	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		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.; 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	Y1 capacitor	P
	Y1 or Y2 capacitors comply with IEC 60384-14	One approved Y1 capacitor	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

EN 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Part of the controlgear	(see Annex 2)	N/A
	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
	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
- (9.2)	Provision for functional earthing		N/A
	Comply with clause 8 and 9.1		N/A
- (9.3)	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) at ≥ 10 A according 7.2.3 of IEC 60598-1: $< 0,5 \Omega$		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 mm ² and of copper or equivalent		N/A

EN 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	Protective earthing wires in line with 5.3.1.1 and clause 7		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 and each of the accessible metal parts at ≥ 10 A according 7.2.3 of IEC 60598-1: $< 0,5 \Omega$		N/A
	Output earthing terminal marked as in 7.1 t) of IEC 61347-1		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 ($M\Omega$):		P
	For basic insulation $\geq 2 M\Omega$	$\geq 2 M\Omega$	P
	For double or reinforced insulation $\geq 4 M\Omega$	$\geq 4 M\Omega$	P
	Between primary and secondary circuits in controlgear providing SELV, values in Annex L in IEC 61347-1	See Annex L	P
11 (-)	Adequate insulation between input and output terminals not bounded together in SELV-equivalent controlgear		P

12 (12)	ELECTRIC STRENGTH		P
	Immediately after clause 11 electric strength test for 1 min		P
	Basic insulation for SELV, test voltage 500 V		P
	Working voltage ≤ 50 V, test voltage 500 V		P
	Working voltage > 50 V ≤ 1000 V, test voltage (V):		P
	Basic insulation, $2U + 1000$ V	1480V (U=240)	P
	Supplementary insulation, $2U + 1000$ V	1480V (U=240)	P
	Double or reinforced insulation, $4U + 2000$ V	2960V (U=240)	P
	No flashover or breakdown		P

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Clause	Requirement + Test	Result - Remark	Verdict
	Solid or thin sheet insulation for double or reinforced insulation fulfil the requirements in Annex N in IEC 61347-1	Insulation sheet	P

14 (14)	FAULT CONDITIONS		P
- (14)	When operated under fault conditions the controlgear:		P
	- 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		P
	Fault conditions: capacitors, resistors or inductors without proof of compliance with relevant specifications have been short-circuited or disconnected	(see appended table)	P
- (14.1)	Short-circuit of creepage distances and clearances if less than specified in clause 16 in Part 1 (except between live parts and accessible metal parts)		P
	Creepage distances on printed boards less than specified in clause 16 in Part 1 provided with coating according to IEC 60664-3		N/A
- (14.2)	Short-circuit or interruption of semiconductor devices	(see appended table)	P
- (14.3)	Short-circuit across insulation consisting of lacquer, enamel or textile	(see appended table)	N/A
- (14.4)	Short-circuit across electrolytic capacitors	(see appended table)	P
- (14.5)	After the tests has been carried out on three samples:		P
	The insulation resistance $\geq 1 \text{ M}\Omega$	Min. $2 \text{ M}\Omega$	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
- (14.6)	Relevant fault condition tests with high-power supply		—
14 (-)	Temperature declared thermally protected lamp controlgear fulfil requirements in Annex C		P

EN 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
15 (-)	TRANSFORMER HEATING		—
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
15.2 (-)	Normal operation		P
	Comply with clause L.6 of IEC 61347-1	See table15.1	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		N/A
	Double LED modules or equivalent load connected in series to the output terminals of constant current type		P
15 (-)	During and at the end of the tests no defect impairing safety, nor any smoke or flammable gases produced		P

16 (15)	CONSTRUCTION		—
- (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		N/A
	No dangerous compatibility between output socket-outlet and a plug for socket-outlets for input circuit in relation to installation rules, voltages and frequencies		N/A
	Plugs and socket-outlets for SELV comply with IEC 60906-3 and IEC 60884-2-4		N/A

EN 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
	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:		N/A
	- plugs not able to enter socket-outlets of other standardised system		N/A
	- socket-outlets not admit plugs of other standardised system		N/A
	- socket-outlets without protective earth		N/A

17 (16)	CREEPAGE DISTANCES AND CLEARANCES		—
- (16)	Creepage distances and clearances according to Table 3 and 4, as appropriate		N/A
	Controlgears providing SELV comply with L.11 in Annex L	(see appended table)	P
	Insulating lining of metallic enclosures		N/A
	Basic insulation on printed boards tested according to clause 14		P
	Distances subjected to both sinusoidal voltage as non-sinusoidal pulses not less than value in either Table 3 or 4		N/A
	Creepage distances not less than minimum clearance		P

18 (17)	SCREWS, CURRENT-CARRYING PARTS AND CONNECTIONS		—
	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

EN 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
(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		—
- (18.1)	Ball-pressure test:		P
	- part tested; temperature (°C) :	Transformer Bobbin: 134°C; 0,43mm	P
	- part tested; temperature (°C) :	Plastic enclosure: 125°C; 0,88mm	P
- (18.2)	Test of printed boards:		P
	- part tested :	PCB:129°C; 0,22mm	P
- (18.3)	Glow-wire test (650°C):		P
	- part tested :	PCB, Transformer Bobbin, Plastic enclosure	P
- (18.4)	Needle flame test (10 s):		P
	- part tested :	PCB, Transformer Bobbin, Plastic enclosure	P
- (18.5)	Tracking test:		N/A
	- part tested :		N/A
	- part tested :		N/A

EN 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict
20 (19)	RESISTANCE TO CORROSION		—
	- test according 4.18.1 of IEC 60598-1		N/A
	- adequate varnish on the outer surface		N/A

14	TABLE: tests of fault conditions					P
Part	Un	Un	Short-circuited	Dis-connected	Remark	Hazard
D1	220	240	X	—	Fuse open on LED driver PWB; No fire, no hazard.	YES/NO
C9	220	240	X	—	Fuse open on LED driver PWB; No fire, no hazard.	YES/NO
Q1(e-b)	220	240	X	—	Unit shut down; input: 0,042A; 2,8W; recoverable; no fire; no hazard	YES/NO
Q1(e-c)	220	240	X	—	Unit work;input: 0,11A; 24.1W; recoverable; no fire; no hazard	YES/NO
Q1(b-c)	220	240	X	—	Unit shut down; input: 0,04A; 1,9W; recoverable; no fire; no hazard	YES/NO
T1 (pin 1-2)	220	240	X	—	Unit work;input: 0,088A ; 22,7W; recoverable; no fire; no hazard	YES/NO
T1 (pin 3-4)	220	240	X	—	Unit work;input: 0,087A ; 22,3W; recoverable; no fire; no hazard	YES/NO
IC1(1-5)	220	240	X	—	Unit shut down; input: 0,05A ; 2,3W; recoverable; no fire; no hazard	YES/NO
T1 (pin 5-6)	220	240	X	—	Unit work;input: 0,08A ; 17,9W; recoverable; no fire; no hazard	YES/NO
T1 (pin 7-8)	220	240	X	—	Unit work;input: 0.08A ; 18,3W; recoverable; no fire; no hazard	YES/NO
IC3(1-5)	220	240	X	—	Unit shut down; input: 0,05A ; 2,0W; recoverable; no fire; no hazard	YES/NO
IC3(2-3)	220	240	X	—	Unit shut down; input: 0,05A ; 2,1W; recoverable; no fire; no hazard	YES/NO
D5	220	240	X	—	Unit work;input: 0,10A; 23,2W; recoverable; no fire; no hazard	YES/NO
C13	220	240	X	—	Unit work;input: 0,09A; 23,1W; recoverable; no fire; no hazard	YES/NO
Output	220	240	X	—	Unit shut down; input: 0,024A ; 1,0W; recoverable; no fire; no hazard,	YES/NO

EN 61347-2-13			
Clause	Requirement + Test	Result - Remark	Verdict

15.1	TABLE: Normal operation						P
	Supply voltage (V)	240V/50Hz	254,4V/50 Hz	—	—	—	—
	Input current(A)	0,101	0,157	—	—	—	—
	Ambient Tmin (°C)	63,0	63,0	—	—	—	—
	Ambient Tmax (°C)	63,0	63,0	—	—	—	—
Maximum measured temperature T of part/at::		T (°C)					Allowed Tmax (°C)
Input wire		90,5	91,3	—	—	—	180
Output wire		87,2	88,4	—	—	—	105
C2(x cap)		102,5	103,0	—	—	—	110
C22(y cap)		87,1	87,5	—	—	—	125
MV1(Varistor)		78,3	78,7	—	—	—	85
L3 winding		103,1	103,7	—	—	—	130
L1 winding		106,1	106,9	—	—	—	130
C9		101,2	102,2	—	—	—	105
PCB near D1, T130		105,9	106,9	—	—	—	130
PCB under T1, T130		100,2	101,6	—	—	—	130
Transformer (T1) coil, class 130 (B)		110,4	111,6	—	—	—	120
Transformer(T1) bobbin		109,4	110,6	—	—	—	150
C13		99,2	100,1	—	—	—	105
Enclosure inside above T1		87,7	88,4	—	—	—	Ref.
tc above Enclosure		90	91,1	—	—	—	90
Enclosure bottom(inside)		99,1	99,7	—	—	—	
Supplementary information: The insulation system of isolating transformer is class B							

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Clause	Requirement + Test				Result - Remark	
17 (16)	TABLES: Creepage distances and clearances				N/A	
Table 3	Minimum distances (mm) for a.c. (50/60 Hz) sinusoidal voltages				N/A	
RMS working voltage (V) not exceeding		50	150	250	500	750 1000
Creepage distances						
Required basic insulation, $PTI \geq 600$		0,6	0,8	1,5	3	4 5,5
Measured		—	—	—	—	—
Required basic insulation, $PTI < 600$		1,2	1,6	2,5	5	8 10
Measured		—	—	—	—	—
Required supplementary insulation $PTI \geq 600$		-	0,8	1,5	3	4 5,5
Measured		—	—	—	—	—
Required supplementary insulation $PTI < 600$		-	1,6	2,5	5	8 10
Measured		—	—	—	—	—
Required reinforced insulation		-	3,2	5	6	8 11
Measured		—	—	—	—	—
Clearances						
Required basic insulation		0,2	0,8	1,5	3	4 5,5
Measured		—	—	—	—	—
Required supplementary insulation		-	0,8	1,5	3	4 5,5
Measured		—	—	—	—	—
Required reinforced insulation		-	1,6	3	6	8 11
Measured		—	—	—	—	—
Table 4	Minimum distances (mm) for non-sinusoidal pulse voltages				—	

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Clause	Requirement + Test			Result - Remark			Verdict
<i>Rated pulse voltage (peak kV)</i>	2,0	2,5	3,0	4,0	5,0	6,0	8,0
<i>Required clearances</i>	1,0	1,5	2	3	4	5,5	8
<i>Measured</i>	—	—	—	—	—	—	—
<i>Rated pulse voltage (peak kV)</i>	10	12	15	20	25	30	40
<i>Required clearances</i>	11	14	18	25	33	40	60
<i>Measured</i>	—	—	—	—	—	—	—
<i>Rated pulse voltage (peak kV)</i>	50	60	80	100	-	-	-
<i>Required clearances</i>	75	90	130	170	-	-	-
<i>Measured</i>	—	—	—	—	—	—	—

A (A)	ANNEX A - TEST TO ESTABLISH WHETHER A CONDUCTIVE PART IS A LIVE PART WHICH MAY CAUSE AN ELECTRIC SHOCK		—
(A.1)	Comply with A.2 or A.3		P
(A.2)	Voltage ≤ 35 V peak or ≤ 60 V d.c	max.50VDC	P
(A.3)	If voltage > 35 V peak or > 60 V d.c. or protective impedance device; touch current does not exceed 0,7 mA (peak) or 2 mA d.c.	Output voltage < 50 VDC	N/A
	Comply with Annex G of IEC 60598-1		P

C (C)	ANNEX C – PARTICULAR REQUIREMENTS FOR ELECTRONIC LAMP CONTROLGEAR WITH MEANS OF PROTECTION AGAINST OVERHEATING		—
(C3)	GENERAL REQUIREMENTS		P
(C3.1)	Thermal protection means integral with the convertor, protected against mechanical damage		P
	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

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Clause	Requirement + Test	Result - Remark	Verdict
	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		P
(C6.2)	Declaration of the type of protection provided		N/A
(C7)	LIMITATION OF HEATING		N/A
(C7.1)	Preselection test:		P
	Test sample placed for at least 12 h in an oven having temperature ($t_c - 5$) K		P
	No operation of the protection device		N/A
(C7.2)	Functioning of protection means:		P
	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		P
	No operation of the protection device		N/A
	Introducing of the most onerous test condition determined during test of clause 14		P
	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		P
	Ballasts according to C5 a) or C5 e) operated until stable conditions are achieved		N/A
	Automatic-resetting thermal protectors working 3 times		P

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Clause	Requirement + Test	Result - Remark	Verdict
	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		P
	Any overshoot of 10% over the marked value within 15 min		P
D (D)	ANNEX D – REQUIREMENTS FOR CARRY OUT THE HEATING TESTS OF THERMALLY PROTECTED LAMP CONTROLGEAR		—
	Tests in C7 performed in accordance with Annex D, if applicable		P
E (E)	ANNEX E – USE OF CONSTANT S OTHER THAN 4500 IN t_w TESTS		—
	Comply with tests according Annex E		N/A
F	ANNEX F - DRAUGHT-PROOF ENCLOSURE		—
	Draught-proof enclosure in accordance with the description		P
	Dimensions of the enclosure		P
	Other design; description		N/A
H (H)	ANNEX H - TESTS		—
	All tests performed in accordance with the advice given in Annex H, if applicable		P
I (L)	ANNEX I: PARTICULAR ADDITIONAL REQUIREMENTS FOR SELV D.C. OR A.C. SUPPLIED ELECTRONIC CONTROLGEAR FOR LED MODULES		—
(L.3)	Classification		—
	Class I	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Class II	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	Class III	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—

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Clause	Requirement + Test	Result - Remark	Verdict
	non-inherently short circuit proof controlgear	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	—
	inherently short circuit proof controlgear	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	fail safe controlgear	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
	non-short-circuit proof controlgear	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
(L.4)	Marking		—
	Adequate symbols are used		P
(L.5)	Protection against electric shock		—
	Comply with 9.2 of IEC 61558-1		P
(L.6)	Heating		—
	No excessive temperatures in normal use		P
	Value if capacitor t_c marked	X capacitor: 110°C Y capacitor: 125°C	—
	Winding insulation classified as Class	Class 130 (B)	—
	Comply with tests of clause 14 of IEC 61558-1 with adjustments		P
(L.7)	Short-circuit and overload protection		—
	Comply with tests of clause 15 of IEC 61558-1 with adjustments	(See appended table L.7)	P
(L.8)	Insulation resistance and electric strength		—
(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	Min 20MΩ	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	Min 20MΩ	P
(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

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Clause	Requirement + Test	Result - Remark	Verdict
	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	1500V	P
	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		—
(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		—
	Protective devices comply with 20.6 – 20.11 of IEC 61558-1		P
(L.11)	Creepage distances and clearances		—
	1. Insulation between input and output circuits, basic insulation:		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
	2. Insulation between input and output circuits, double or reinforced insulation:		P
	a) measured values \geq specified values (mm)	See table L.11	P
	b) measured values \geq specified values (mm)		N/A
	c) measured values \geq specified values (mm)	See table L.11	P
	3. Insulation between adjacent <u>input</u> circuits		N/A
	- measured values \geq specified values (mm)		N/A
	3. Insulation between adjacent <u>output</u> circuits		N/A
	- measured values \geq specified values (mm)		N/A
	4. Insulation between terminals for external connection:		N/A
	- measured values \geq specified values (mm)		N/A
	5. Basic or supplementary insulation:		P
	a) measured values \geq specified values (mm)	See table L.11	P

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Clause	Requirement + Test	Result - Remark	Verdict
	b) measured values \geq specified values (mm)		N/A
	c) measured values \geq specified values (mm)	See table L.11	P
	d) measured values \geq specified values (mm)		N/A
	e) measured values \geq specified values (mm)		N/A
	6. Reinforced insulation or insulation:		P
	Between body and output circuit: measured values \geq specified values (mm)	See table L.11	P
	Between body and output circuit if provision against transient voltages: measured values \geq specified values (mm)		N/A
	7. Distance through insulation:		P
	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)	See table L.11	P

(N)	ANNEX N: REQUIREMENTS FOR INSULATION MATERIALS USED FOR DOUBLE OR REINFORCED INSULATION		—
(N.4)	General requirements		—
(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	Insulation sheet	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	Insulating tape	P
	- Non-separated layers: Min. 3 layers and fulfil mandrel test of 150N		P
	- Separated layers: Min. 2 layers and each layer fulfil mandrel test of 50N		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	- Separated layers (alternative): Min. 3 layers and 2/3 of the layers fulfil mandrel test of 100N		N/A
(N.4.3.2)	Mandrel test (electric strength test during mechanical stress)		N/A
	Electric strength test after mandrel test:		P
	- Non-separated layers: min. 5 kV or 1,35 x test voltage in Table N.1		P
	- 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		N/A
	No flashover or breakdown occurred		N/A

(O)	ANNEX O: ADDITIONAL REQUIREMENTS FOR BUILT-IN ELECTRONIC CONTROLGEAR WITH DOUBLE OR REINFORCED INSULATION		—
(O.6)	Marking		—
	Marking according clause 7 (7)	See clause 7	P
	Special symbol		P
	Meaning of the special symbol explained in catalogue		P
(O.7)	Protection against accidental contact with live parts		—
	Requirements of clause 8 (10)	See clause 8	P
	Test finger not possible to make contact with basic insulated metal parts		P
(O.8)	Terminals		—
	Clause 9 (8)	See clause 9	N/A
(O.9)	Provision for earthing		—
	Functional earthing terminals comply with clause 9 of part 1		N/A
	No protective earthing terminal		N/A
(O.10)	Moisture resistance and insulation		—
	Clause 11 (11)	See clause 11	P
(O.11)	Electric strength		—
	Clause 12 (12)	See clause 12	P
(O.13)	Fault conditions		—

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Clause	Requirement + Test	Result - Remark	Verdict
	Clause 14 (14)	See clause 14	P
	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		P
	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		P
(O.14)	Construction		—
	Clause 17 (15)	See clause 17	P
	Accessible metal parts insulated from live parts by double or reinforced insulation		P
	Live part insulated from supporting surface in contact with external faces by double or reinforced insulation		P
(O.15)	Creepage distances and clearances		—
	Clause 18 (16)	See clause 18	P
	Comply with corresponding values for luminaries in IEC 60598-1		P
(O.16)	Screws, current-carrying parts and connections		—
	Clause 19 (17)	See clause 19	P
(O.17)	Resistance to heat and fire		—
	Clause 20 (18)	See clause 20	P
(O.18)	Resistance to corrosion		—
	Clause 21 (19)	See clause 21	N/A

J	ANNEX J: PARTICULAR ADDITIONAL SAFETY REQUIREMENTS FOR A.C., A.C./D.C. OR D.C. SUPPLIED ELECTRONIC CONTROLGEAR FOR EMERGENCY LIGHTING		—
J.1	General		—
	Intended for centralized emergency power supply	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	—
J.2	Marking		—
J.2.1	Mandatory markings		N/A

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Clause	Requirement + Test	Result - Remark	Verdict
	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 $\pm 15\%$		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
	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

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Clause	Requirement + Test	Result - Remark	Verdict

I.7 (L.7)	TABLE: Heating - abnormal operation (short-circuit and over-loads)		P
	Type reference..... :	EBR020E-0700-30	—
	ta(C) :	63,0	—
	Lamp used :	LED modules	—
	Mounting position..... :	As in normal use	—
	Test voltage(V)..... :	1,1x240V=264V	—
Model	Primary Winding (°C)	Limit (°C)	
Input wire	93.7	180	
Transformer (T1) coil, class 130(B)	125,0	175	
Output wire	93.1	105	
Support under T1	104.1	105	
tc above Enclosure	97.8	105	

I.11 (L.11)	TABLES: Creepage distances and clearances measurement						P
reepage distance Cr. and clearance Cl. at/of:	Up (V)	U rms (V)	Measured		Required in Table L.5		
			Cl. (mm)	Cr. (mm)	Cl. (mm)	Cr. (mm)	
Basic Insulation							
Different polarities of live parts (L/N)	-	240	12,36	12,36	2,4	2,5	
Two ends of fuse (F1)	-	240	8,04	8,04	2,4	2,5	
Reinforced or Double Insulation							
Pri. and sec. track under T1	-	240	5,0	7,5	4,6	4,8	
Pri. and sec. track under C22	-	240	5,2	7,8	4,6	4,8	
Live part (line) to accessible surface	-	240	5,88	5,88	4,6	4,8	
T1 core to C13	-	240	7,85	7,85	4,6	4,8	
T1 core to C11	-	240	17,25	17,25	4,6	4,8	
DTI (Distance through insulation)							
DTI at/of:	Up	U rms	Measured thickness / No. of		Required limit		

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Clause	Requirement + Test	Result - Remark	Verdict

	(V)	(V)	layers (mm)	(mm)
Insulating tape between T1 core and secondary components	-	240	0,30 (consist of 3 layers)	0,25

	ANNEX 1: components	P
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object/part No.	code	manufacturer/ trademark	type/model	technical data	standard	mark(s) of conformity
Enclosure	B	SABIC INNOVATIVE PLASTICS B V	945 (GG)	V-0, 120°C	--	UL E45329
Input wire	B	FOSHAN ZHUO SHENG GREEN WIRE CO LTD	1672	105°C, 18AWG 300V, double insulation	--	UL E251755
Fuse	B	Cooper Bussmann LLC	SS-5H- Serie(s)	AC 250V/300V; 1A	IEC 60127-1 IEC 60127-3	VDE 40031800
Inductance wire(L1,L3)	B	HENG YA ELECTRIC (DONGGUAN) LTD	LZ-UENFB&	130°C	-	UL E197768
Alt.	D	DONG GUAN XIN YOU LIAN COPPER CO LTD	2UEW	130°C	-	UL E222363
Alt.	D	PACIFIC ELECTRIC WIRE & CABLE (SHENZHEN) CO LTD	UEW	130°C	-	UL E222363
X-capacitor	B	Nistronics (Jiangxi) Co., Ltd.	MPR	AC 310V, 110°C; X2 type	IEC 60384-14	VDE 40040406
Alt.	D	Nistronics (Jiangxi) Co., Ltd.	MPR	AC 310V, 110°C; X2 type	IEC 60384-14	VDE 40032056
Y-capacitor	B	JYH HSU(JEC) Electronic LTD	JD	3300pF, 400Vac, Y1 type, 125°C	IEC 60384-14	VDE 40038642
Transformer	B	Energy Recovery Products (Zhuhai) Co., Ltd	6900-01087-5	Class 130 (B)	--	Tested with appliance

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Clause	Requirement + Test			Result - Remark		Verdict
-Bobbin	B	SUMITOMO BAKELITE CO LTD	PM-9820	PF, 150°C, V-0	--	UL E 41429
-Secondary winding	B	DONG GUAN YIDA INDUSTRIAL CO LTD	xUEW/130, QA-x/130	130°C	--	UL E344055
-Insulation tape	D	3M TAIWAN LTD	1388Y-1 (a)	130°C	--	UL E305006
-Primary wire(Triple- insulated wire)	B	Great Leoflon Industrial Co., Ltd.	TRW (B)-2 Series	130°C	IEC 60950-1	VDE 136581
- <u>teflon</u> tube	B	ZHUHAI CHANGXIAN NEW MATERIALS TECHNOLOGY CO LTD	E962	200°C	--	UL E335405
PCB	B	ZhuHai XinHengTian Electron Co LTD	XHT-D1	V-0, 130°C	--	UL E471390
Output wire	B	FOSHAN ZHUO SHENG GREEN WIRE CO LTD	1430	18AWG, 105°C	--	UL E251755
Varistor (MV1/MV2)	B	Thinking Electronic Industrial Co., Ltd.	TVR07180 to TVR07821	250A; 2,5A	IEC 61051-1 IEC 61051-2 IEC 61051-2-2	VDE 005944

The codes above have the following meaning:

- A - The component is replaceable with another one, also certified, with equivalent characteristics
- B - The component is replaceable if authorised by the test house
- C - Integrated component tested together with the appliance
- D - Alternative component

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Clause	Requirement + Test	Result - Remark	Verdict

	ANNEX 2: screw terminals (part of the luminaire)	—
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(14)	SCREW TERMINALS	—
(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)...	M
	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)	P
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(15)	SCREWLESS TERMINALS	—
(15.2)	Type of terminal.....	—

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Clause	Requirement + Test	Result - Remark	Verdict
	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)	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
(15.6)	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)	-	-	-	-	-	-	-	-	-	-

Attachment photo

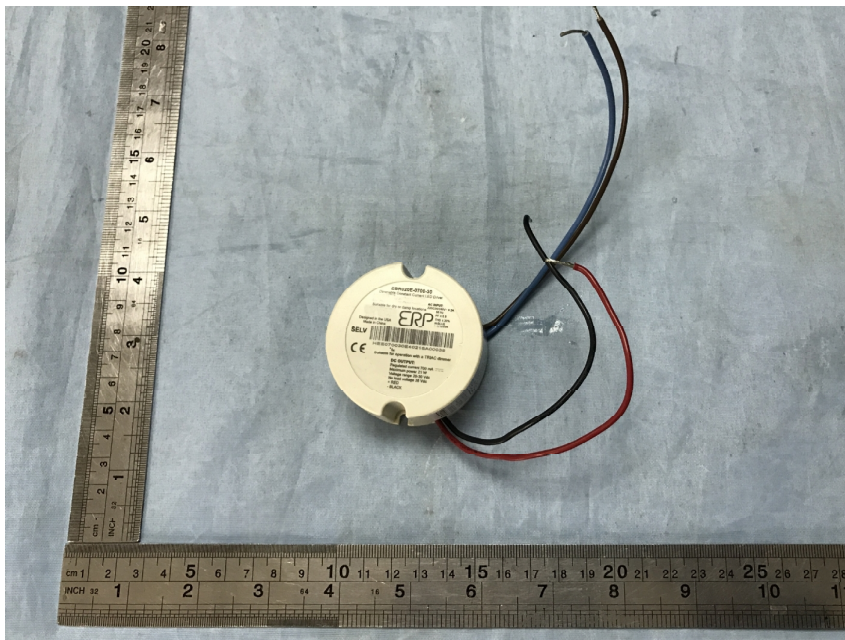


Photo 1: overview of model EBR020E-0700-30
(All of models are same construction)

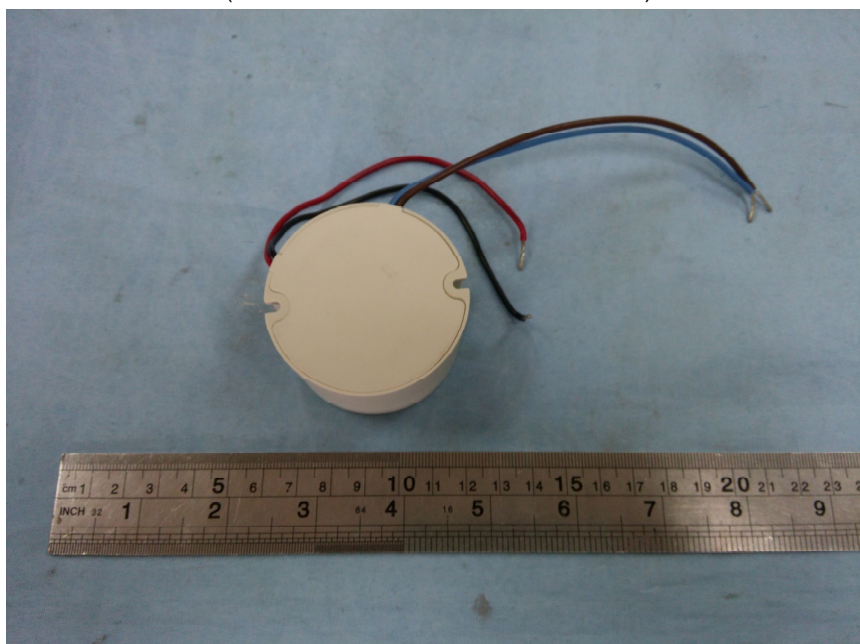


Photo 2: overview of model EBR020E-0700-30

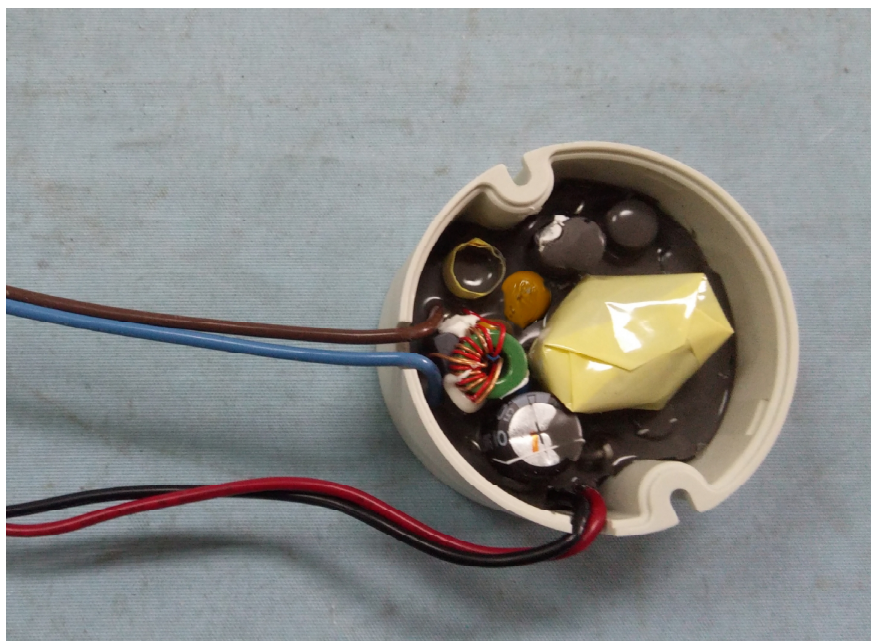


Photo 3: Internal view of model EBR020E-0700-30



Photo 4: Internal view of model EBR020E-0700-30

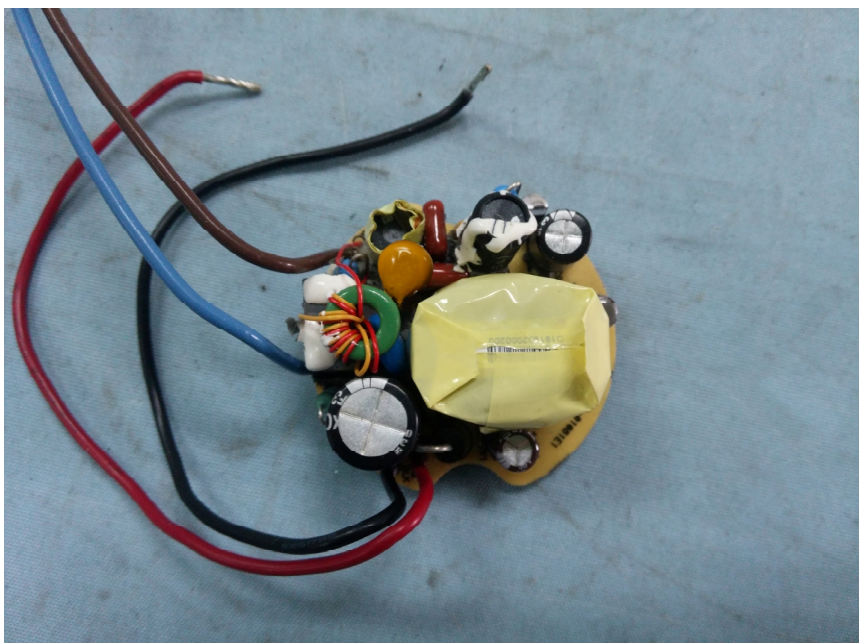


Photo 5: LED driver of model EBR020E-0700-30

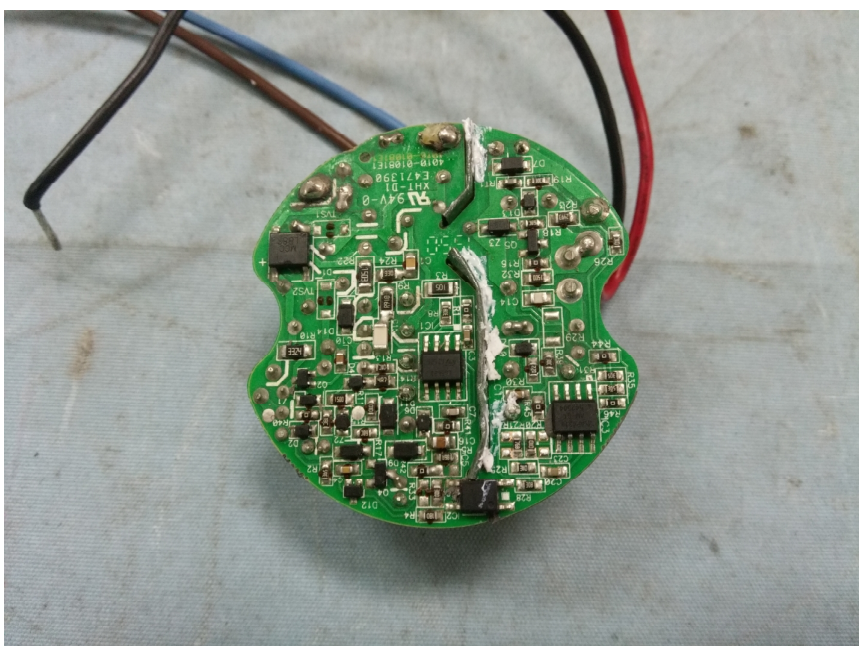


Photo 6: LED driver of model EBR020E-0700-30

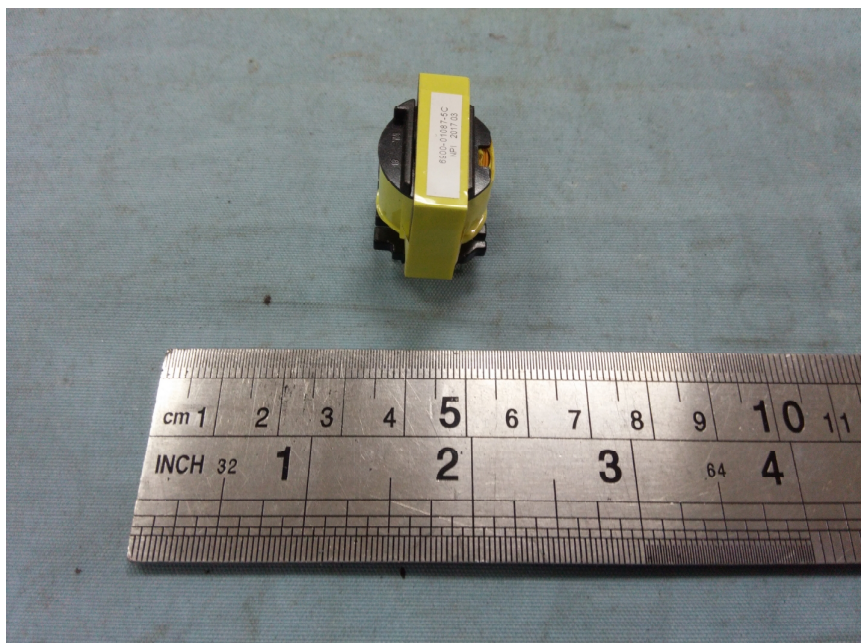


Photo 7: Transformer view of model EBR020E-0700-30



Photo 8: Transformer view of model EBR020E-0700-30

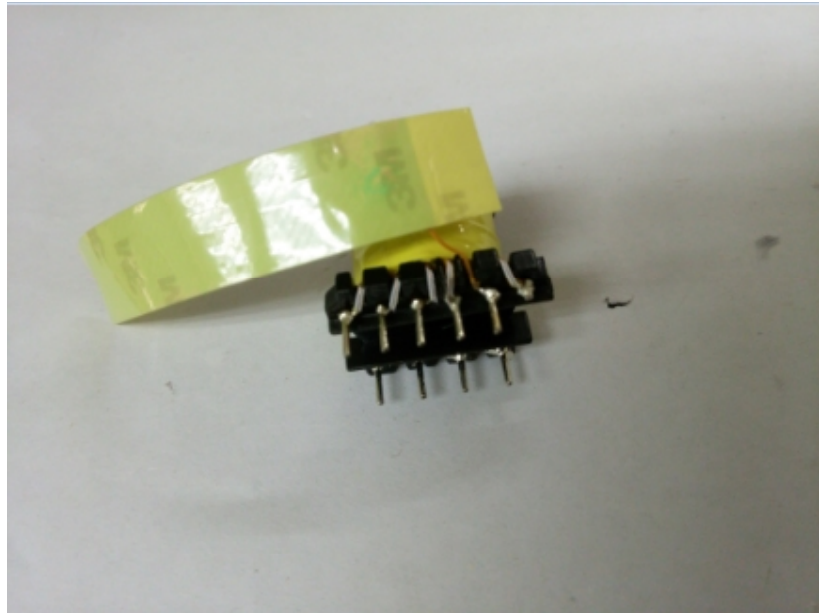


Photo 9: Transformer view of model EBR020E-0700-30

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