



Test Report issued under the responsibility of:



TEST REPORT

IEC 62368-1

Audio/video, information and communication technology equipment

Part 1: Safety requirements

Report Number: E135494-A6030-CB-1

Date of issue.....: 2020-03-27

Total number of pages: 69

Applicant's name.....: **TDK-LAMBDA UK LTD**

Address: **KINGSLEY AVE
ILFRACOMBE
EX34 8ES UNITED KINGDOM**

Name of Test Laboratory: UL International Polska Sp. z o.o.
preparing the Report: Aleja Krakowska 81, 05-090 Sekocin Nowy, Poland

Test specification:

Standard: IEC 62368-1:2014 (Second Edition)

Test procedure: CB Scheme

Non-standard test method: N/A

Test Report Form No.....: IEC62368_1B

Test Report Form(s) Originator: UL(US)

Master TRF.....: 2014-03

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The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.

Test Item description	: AC-DC Power Supply	
Trade Mark	: TDK-Lambda TDK-Lambda	
Manufacturer	: TDK-LAMBDA UK LTD KINGSLEY AVE ILFRACOMBE EX34 8ES UNITED KINGDOM	
Model/Type reference	: Model/type reference: DRB120-XX-1/yyy (where XX can be 12 or 48 for the output voltage and yyy is optional and can be alphanumeric characters or blank and is for non-safety related changes - product ratings unchanged)	
Ratings	: Input: 100-240 VAC, 1.5 A, 50/60 Hz Output DRB120-12-1: Rated: 12-13.2 Vdc, 10-9.09 A Peak: 12-13.2 Vdc, 12-10.9 A, Max 10sec. Output DRB120-48-1: Rated: 48-52.8 Vdc, 2.5-2.27 A Peak: 48-52.8 Vdc, 3-2.72 A, Max 10sec.	
Testing procedure and testing location:		
<input checked="" type="checkbox"/>	CB Testing Laboratory:	
Testing location/ address	: UL International Polska Sp. z o.o., Aleja Krakowska 81, 05-090 Sekocin Nowy, Poland	
Tested by (name + signature)	Hubert Koszewski / Project Handler	
Approved by (name + signature)	Dennis Butcher / Reviewer	
Testing procedure: CTF Stage 1		
Testing location/ address	:	
Tested by (name + signature)		
Approved by (name + signature)		
Testing procedure: CTF Stage 2		

Testing location/ address..... :		
Tested by (name + signature)..... :		
Witnessed by (name + signature)..... :		
Approved by (name + signature)..... :		
<input type="checkbox"/>	Testing procedure: CTF Stage 3	
<input type="checkbox"/>	Testing procedure: CTF Stage 4	
Testing location/ address..... :		
Tested by (name + signature)..... :		
Witnessed by (name + signature)..... :		
Approved by (name + signature)..... :		
Supervised by (name + signature)..... :		

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

National Differences (30 pages)

Enclosures (52 pages)

Summary of testing:**Tests performed (name of test and test clause):**

STEADY FORCE TEST, 250 N (4.4.4.2, ANNEX T.5)

IMPACT TEST (4.4.4.4, ANNEX T.6)

CLASSIFICATION OF ELECTRICAL ENERGY SOURCES (5.2, 5.7)

DETERMINATION OF WORKING VOLTAGE (5.4.1.8)

ELECTRIC STRENGTH TEST (5.4.9)

SAFEGUARDS AGAINST CAPACITOR DISCHARGE AFTER DISCONNECTION OF A CONNECTOR (5.5.2.2)

RESISTANCE OF THE PROTECTIVE BONDING SYSTEM (5.6.6.2)

PROSPECTIVE TOUCH VOLTAGE AND TOUCH CURRENT MEASUREMENT (5.7)

INPUT TEST: SINGLE PHASE (B.2.5)

NORMAL OPERATING CONDITIONS TEMPERATURE MEASUREMENT (B.2.6)

SIMULATED ABNORMAL OPERATING CONDITIONS (B.3)

SIMULATED SINGLE FAULT CONDITIONS (B.4)

TRANSFORMER OVERLOAD (ANNEX G.5.3.3)

LIMITED SHORT CIRCUIT TEST (ANNEX R.1, 5.6.4.1, 5.6.4.4, 5.6.5.1)

Testing Location:**CBTL: UL International Polska Sp. z o.o., Aleja Krakowska 81, 05-090 Sekocin Nowy, Poland****Summary of compliance with National Differences:****List of countries addressed:** Australia / New Zealand, EU Group and National Differences, Japan, USA / Canada

EU Group and National Differences applies to CENELEC member countries: Austria , Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom

The product fulfils the requirements of: EN 62368-1:2014+A11:2017

Copy of Marking Plate - Refer to Enclosure titled Marking Plate for copy.

TEST ITEM PARTICULARS:	
Classification of use by	Instructed person
Supply Connection	AC Mains
Supply % Tolerance	+10% / -15%
Supply Connection – Type	Terminal Block for internal connection within end product
Considered current rating of protective device as part of building or equipment installation	20A A; building;
Equipment mobility	for building-in
Over voltage category (OVC)	OVC II
Class of equipment	Class I
Access location	N/A
Pollution degree (PD)	PD 2
Manufacturer’s specified maximum operating ambient (°C)	55°C, above 55°C derated linearly to 50% output power at 70°C
IP protection class	IPX0
Power Systems	TN
Altitude during operation (m)	3000 m
Altitude of test laboratory (m)	2000 m or less
Mass of equipment (kg)	0.45
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..... :	2019-12-19
Date (s) of performance of tests..... :	2020-02-04, 2020-03-04 to 2020-03-16
GENERAL REMARKS:	
<p>“(See Enclosure #)” refers to additional information appended to the report. “(See appended table)” refers to a table appended to the report.</p> <p>Throughout this report a <input type="checkbox"/> comma / <input checked="" type="checkbox"/> point is used as the decimal separator.</p>	
Manufacturer’s Declaration per sub-clause 4.2.5 of IEC60335-1:	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> Not applicable

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

Name and address of factory (ies)	<p>TDK-LAMBDA UK LTD KINGSLEY AVE ILFRACOMBE EX34 8ES UNITED KINGDOM</p> <p>PANYU TRIO MICROTRONICS CO LTD SHIJI INDUSTRIAL ESTATE DONGYONG NANSHA GUANGZHOU GUANGDONG 511453 CHINA</p>
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GENERAL PRODUCT INFORMATION:

Report Summary

All applicable tests according to the referenced standard(s) have been carried out.

Product Description

The product covered in this report is a building-in component switch-mode power supply (DIN rail type).

Model Differences

DRB120-12-1 and DRB120-48-1 are almost identical except for the output voltage and current ratings. Output power is the same for both models, rated 120W.

Additional application considerations – (Considerations used to test a component or sub-assembly) -

Output Test Load for DRB120-12-1:

Condition A (rated output)
12 Vdc, 10 A

Condition B (maximum rated output)
13.2 Vdc, 9.09 A

Condition C (50% power derating at maximum ambient)
12 Vdc, 5A @ 70°C

Condition D (peak output current)
12 Vdc, cycle: 12 A for 10 seconds, 3 A for 19 seconds

Output Test Load for DRB120-48-1:

Condition A (rated output)
48 Vdc, 2.5 A

Condition B (maximum rated output)

52.8 Vdc, 2.27 A

Condition C (50% power at maximum ambient)

48 Vdc, 1.25A @ 70°C

Condition D (peak output current)

48 Vdc, cycle: 3 A for 10 seconds, 0.75 A for 19 seconds

Technical Considerations

- The product was submitted and evaluated for use at the maximum ambient temperature (T_{ma}) permitted by the manufacturer's specification of : 55°C, above 55°C derated linearly to 50% output power at 70°C
- The product is intended for use on the following power systems : TN
- Considered current rating of protective device as part of the building installation (A) : 20
- Mains supply tolerance (%) or absolute mains supply values : +10%/-15%
- The equipment disconnect device is considered to be : Provided in end product
- The following were investigated as part of the protective earthing/bonding : Printed wiring board trace (refer to Enclosure - Schematics + PWB for layouts)
- The following are available from the Applicant upon request : Installation (Safety) Instructions / Manual
- The product was investigated to the following additional standard : EN 62368-1:2014 + A11:2017

Engineering Conditions of Acceptability

When installed in an end-product, consideration must be given to the following:

- The following product-line tests are conducted for this product : Electric Strength, Earthing Continuity
- The end-product Electric Strength Test is to be based upon a maximum working voltage of : Primary – Earthed Dead Metal: 280Vrms / 510Vpk, Primary-Secondary: 280Vrms / 510Vpk
- The following output circuits are at ES1 energy levels : PSU output
- The following output circuits are at PS3 energy levels : All circuits
- The maximum investigated branch circuit rating is : 20 A
- The investigated Pollution Degree is : 2
- Proper bonding to the end-product main protective earthing termination is : Required
- An investigation of the protective bonding terminals has : been conducted
- The following end-product enclosures are required : Electrical, Fire
- The following magnetic devices (e.g. transformers or inductor) are provided with an OBJY2 insulation system with the indicated rating greater than Class A (105°C) : T1 (Class 155(F))
- The power supply was evaluated to be used at altitudes up to : 3000 m

ENERGY SOURCE IDENTIFICATION AND CLASSIFICATION TABLE:	
(Note 1: Identify the following six (6) energy source forms based on the origin of the energy.) (Note 2: The identified classification e.g., ES2, TS1, should be with respect to its ability to cause pain or injury on the body or its ability to ignite a combustible material. Any energy source can be declared Class 3 as a worse case classification e.g. PS3, ES3.)	
Electrically-caused injury (Clause 5): (Note: Identify type of source, list sub-assembly or circuit designation and corresponding energy source classification) Example: +5 V dc input ES1	
Source of electrical energy	Corresponding classification (ES)
Primary circuits	ES3 (declared)
Transformer T1 secondary windings	ES3
PSU output	ES1
Electrically-caused fire (Clause 6): (Note: List sub-assembly or circuit designation and corresponding energy source classification) Example: Battery pack (maximum 85 watts): PS2	
Source of power or PIS	Corresponding classification (PS)
All circuits	PS3 (declared)
Injury caused by hazardous substances (Clause 7) (Note: Specify hazardous chemicals, whether produces ozone or other chemical construction not addressed as part of the component evaluation.) Example: Liquid in filled component Glycol	
Source of hazardous substances	Corresponding chemical
N/A	N/A
Mechanically-caused injury (Clause 8) (Note: List moving part(s), fan, special installations, etc. & corresponding MS classification based on Table 35.) Example: Wall mount unit MS2	
Source of kinetic/mechanical energy	Corresponding classification (MS)
Edges and corners	MS1
Mass of equipment	MS1
Thermal burn injury (Clause 9) (Note: Identify the surface or support, and corresponding energy source classification based on type of part, location, operating temperature and contact time in Table 38.) Example: Hand-held scanner – thermoplastic enclosure TS1	
Source of thermal energy	Corresponding classification (TS)
Metal Enclosure	TS1 (product for building-in, instructed and skilled person access)
Radiation (Clause 10) (Note: List the types of radiation present in the product and the corresponding energy source classification.) Example: DVD – Class 1 Laser Product RS1	
Type of radiation	Corresponding classification (RS)
Indication LED	RS1 (Exempt Group)

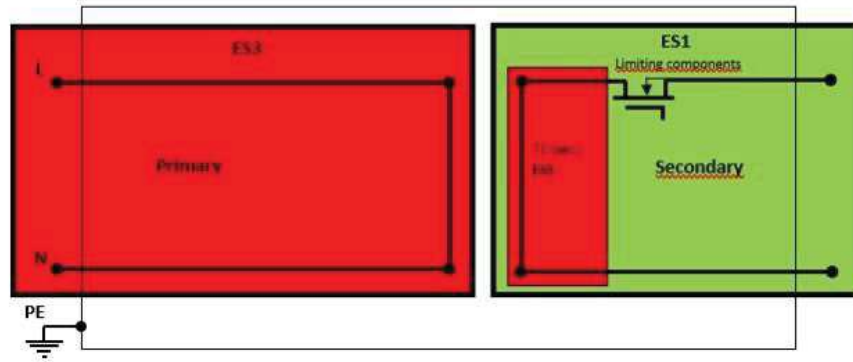
ENERGY SOURCE DIAGRAM

Indicate which energy sources are included in the energy source diagram. Insert diagram below

ES PS MS TS RS

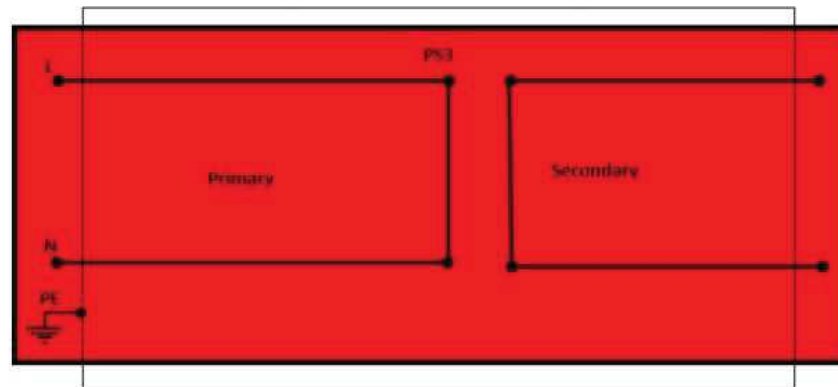
Electrical Energy Source Classification

all models



Power Source Classification

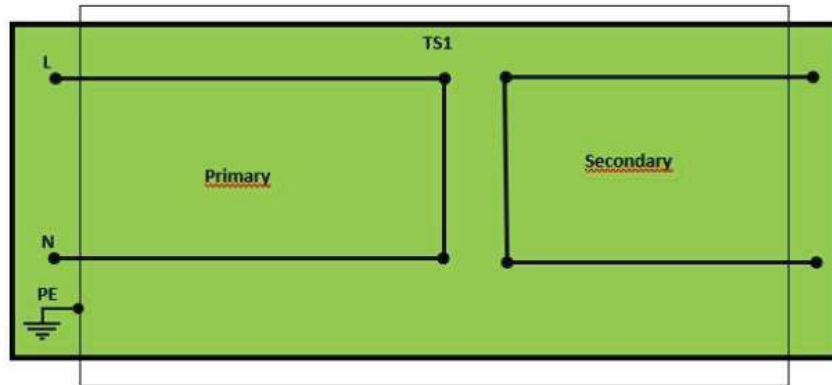
All models



Thermal Energy Source Classification

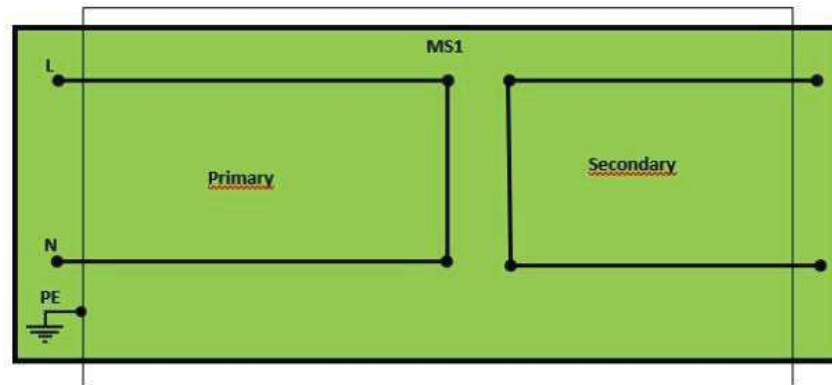
(External surfaces)

All models



Mechanical Energy Source Classification

All models



Radiation Source Classification

All models

