



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-A6026-CB-1

Date of issue.....: 2020-09-28

Total number of pages: 160

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: Równoległa 4, PL-02-235 Warszawa, 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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General disclaimer:

The test results presented in this report relate only to the object tested.
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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	:	Switch mode power supply
Trade Mark	:	TDK LAMBDA TDK-Lambda
Manufacturer	:	TDK-LAMBDA UK LTD KINGSLEY AVE ILFRACOMBE EX34 8ES UNITED KINGDOM
Model/Type reference	:	Vega DC
Ratings	:	INPUT: 34-75Vdc max. 17.5A max
Testing procedure and testing location:		
<input type="checkbox"/>	CB Testing Laboratory:	
Testing location/ address		
Tested by (name + signature)		
Approved by (name + signature)		
<input type="checkbox"/>	Testing procedure: CTF Stage 1	
Testing location/ address		
Tested by (name + signature)		
Approved by (name + signature)		
<input type="checkbox"/>	Testing procedure: CTF Stage 2	
Testing location/ address		
Tested by (name + signature)		
Witnessed by (name + signature)		
Approved by (name + signature)		
<input checked="" type="checkbox"/>	Testing procedure: CTF Stage 3	
<input type="checkbox"/>	Testing procedure: CTF Stage 4	
Testing location/ address		TDK-LAMBDA UK LTD KINGSLEY AVE ILFRACOMBE EX34 8ES UNITED KINGDOM
Tested by (name + signature)		Matt Carter / Tester 

Witnessed by (name + signature).....:	Piotr A. Bizunowicz / Handler	
Approved by (name + signature)	Tracy Burgess / Approver	
Supervised by (name + signature)	Hubert Koszewski / Reviewer	

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

National Differences (30 pages)

Enclosures (74 pages)

Summary of testing:

Tests performed (name of test and test clause):

CLASSIFICATION OF ELECTRICAL ENERGY SOURCES (5.2, 5.7)
 SEPARABLE THIN SHEET MATERIAL (5.4.4.6.2)
 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)
 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)
 STEADY FORCE TEST, 10 N (ANNEX T.2, 5.4.2.6, 5.4.3.2, G.15.3.6)

Testing Location:

**CTF Stage 3: TDK-LAMBDA UK LTD
 KINGSLEY AVE
 ILFRACOMBE
 EX34 8ES UNITED KINGDOM**

CTF-3: TDK-LAMBDA UK LTD, KINGSLEY AVENUE, ILFRACOMBE, DEVON, EX32 8ES, UNITED KINGDOM
 CTF-3: TDK-LAMBDA UK LTD, KINGSLEY AVENUE, ILFRACOMBE, DEVON, EX32 8ES, UNITED KINGDOM
 CTF-3: TDK-LAMBDA UK LTD, KINGSLEY AVENUE, ILFRACOMBE, DEVON, EX32 8ES, UNITED KINGDOM
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 CTF-3: TDK-LAMBDA UK LTD, KINGSLEY AVENUE, ILFRACOMBE, DEVON, EX32 8ES, UNITED KINGDOM

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:

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.

06-AUG-20
MADE IN THE UK

pat: uk.tdk-lambda.com/patents

Input Connection
Input max range: 34-75VDC, 17.5A max

TDK-Lambda
www.emea.tdk-lambda.com

Vega DC

Product Code Customer Data

V000H2P

Serial Number

1111111111

FAN TYPE	F	Integral Fan - Forward Air
FILTER OPTION	S	
PRIMARY OPTION		

WARNING - Hazardous Output Voltages
For Test Certificate : Refer to <http://testcert.emea.tdk-lambda.com>
Refer to emea.tdk-lambda.com/manual for installation manual.

BS	BS	BS	MODULE GC5	

Note: The above markings are the minimum requirements required by the safety lab. For the final production samples, the additional markings which do not give rise to misunderstanding may be added.

TEST ITEM PARTICULARS:	
Classification of use by	Skilled person
Supply Connection	DC Mains
Supply % Tolerance	None
Supply Connection – Type	mating connector
Considered current rating of protective device as part of building or equipment installation	20 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)	50
IP protection class	IPX0
Power Systems	dc mains
Altitude during operation (m)	5000 m
Altitude of test laboratory (m)	2000 m or less
Mass of equipment (kg)	2.5
POSSIBLE TEST CASE VERDICTS:	
- test case does not apply to the test object..... :	N/A
- test object does meet the requirement :	P (Pass)
- test object does not meet the requirement :	F (Fail)
TESTING:	
Date of receipt of test item..... :	2018-10-17 to 2020-08-04, 2020-09-02
Date (s) of performance of tests..... :	2020-07-16 to 2020-08-04
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 IEC60068-2-1:	
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)	1) TDK-LAMBDA UK LTD KINGSLEY AVE ILFRACOMBE EX34 8ES UNITED KINGDOM 2) PANYU TRIO MICROTRONICS CO LTD SHIJI INDUSTRIAL ESTATE DONGYONG NANSHA GUANGZHOU GUANGDONG 511453 CHINA
GENERAL PRODUCT INFORMATION:	
Report Summary	
All applicable tests according to the referenced standard(s) have been carried out.	
Product Description	
Unit is a DC to DC power supply unit, suitable to connection to large battery system or DC mains, with modular output design allowing versatile configuration of output number, voltage and power.	
Model Differences	
See enclosure 7-03	
Additional application considerations – (Considerations used to test a component or sub-assembly) -	
See enclosure 6-02 for guide on selection output modules	
Sample from 2020-09-02 used for construction review 2020-09-02	
Technical Considerations	
<ul style="list-style-type: none"> The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer’s specification of : 50°C The product is intended for use on the following power systems : DC mains supply Considered current rating of protective device as part of the building installation (A) : 20 Mains supply tolerance (%) or absolute mains supply values : DC mains supply, DC Mains: +20%/-15% The equipment disconnect device is considered to be : determined 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, including French language for Canada. 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:	
<ul style="list-style-type: none"> The following product-line tests are conducted for this product : Earthing Continuity, Electric Strength 	

- The following output circuits are at ES1 energy levels : see enclosure
- The following output circuits are at ES2 energy levels : see enclosure
- The following output circuits are at ES3 energy levels : see enclosure
- The following output circuits are at PS3 energy levels : all outputs
- 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 input terminals/connectors must be connected to the end-product supply neutral : Marked "N"
- The following end-product enclosures are required : Electrical, Fire, Mechanical
- 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) : see enclosure 4-01
- The following components require special consideration during end-product Thermal (Heating) tests due to the indicated maximum temperature measurements during component-level testing : see enclosure 7-03
- The following input terminals were evaluated as suitable for direct connection to the DC Mains Supply : L, N
- The equipment is suitable for direct connection to : DC mains supply
- The power supply was evaluated to be used at altitudes up to : 5000 m