Test Report issued under the responsibility of:

TEST REPORT
IEC 60950-1
Information technology equipment - Safety - Part 1: General requirements

Report Reference No ..... :	E135494-A114-CB-1
Date of issue ..... :	2017-11-29
Total number of pages ..... :	63
CB Testing Laboratory ..... :	UL International Germany GmbH
Address ..... :	Admiral-Rosendahl-Strasse 23, 63263 Neu-Isenburg (Zeppelinheim), Germany
Applicant's name ..... :	TDK-LAMBDA UK LTD
Address ..... :	KINGSLEY AVE ILFRACOMBE EX34 8ES UNITED KINGDOM
Test specification:	
Standard ..... :	IEC 60950-1:2005 (Second Edition); Am1:2009 + Am2:2013
Test procedure ..... :	CB Scheme
Non-standard test method ..... :	N/A
Test Report Form No. ..... :	IEC60950_1F
Test Report Form originator ..... :	SGS Fimko Ltd
Master TRF ..... :	Dated 2014-02

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

General disclaimer

The test results presented in this report relate only to the object tested. This report shall not be reproduced, except in full, without the written approval of the Issuing CB Testing Laboratory. 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
Manufacturer ..... :	TDK-LAMBDA UK LTD KINGSLEY AVE ILFRACOMBE EX34 8ES UNITED KINGDOM
Model/Type reference ..... :	DRF960-24-1-xyz where x, y and z can be any alphanumeric character or blank
Ratings ..... :	I/P: 200-240 Vac, 50/60 Hz, 5.1-4.3 A O/P: 24-28 Vdc, 40-34.3 A Maximum power 960 W

Testing procedure and testing location:			
[x]	**CB Testing Laboratory**		
	Testing location / address .....:	UL International Germany GmbH Admiral-Rosendahl-Strasse 23, 63263 Neu-Isenburg (Zeppelinheim), Germany	
[ ]	**Associated CB Test Laboratory**		
	Testing location / address .....:		
	Tested by (name + signature) .....:	Grzegorz Goraj / Project handler	
	Approved by (name + signature)....:	Radoslaw Lukasiewicz / Reviewer	
[ ]	**Testing Procedure: TMP/CTF Stage 1**		
	Testing location / address .....:		
	Tested by (name + signature) .....:		
	Approved by (name + signature)....:		
[ ]	**Testing Procedure: WMT/CTF Stage 2**		
	Testing location / address .....:		
	Tested by (name + signature) .....:		
	Witnessed by (name + signature) ..:		
	Approved by (name + signature)....:		
[ ]	**Testing Procedure: SMT/CTF Stage 3 or 4**		
	Testing location / address .....:		
	Tested by (name + signature) .....:		
	Approved by (name + signature)....:		
	Supervised by (name + signature) .:		
[ ]	**Testing Procedure: RMT**		
	Testing location / address .....:		
	Tested by (name + signature) .....:		
	Approved by (name + signature)....:		
	Supervised by (name + signature) .:		

List of Attachments
National Differences (57 pages)
Enclosures (76 pages)
Summary Of Testing Unless otherwise indicated, all tests were conducted at UL International Germany GmbH Admiral-Rosendahl-Strasse 23, 63263 Neu-Isenburg (Zeppelinheim), Germany.

Tests performed (name of test and test clause)	**Testing location / Comments**

End Product Reference Page

General Guidelines

Power Supply Reference Page

Guide Information Page - Maximum Output Voltage, Current, and Volt Ampere Measurement (1.2.2.1)

Input: Single-Phase (1.6.2)

Durability of Marking (1.7.11)

Capacitance Discharge (2.1.1.7)

SELV Reliability Test Including Hazardous Voltage Measurements (2.2.2, 2.2.3, 2.2.4, Part 22 6.1)

Limited Short-Circuit (2.6.3.4)

Protective Bonding II (2.6.3.4, 2.6.1)

Humidity (2.9.1, 2.9.2, 5.2.2)

Determination of Working Voltage; Working Voltage Measurement (2.10.2)

Thin Sheet Material (2.10.5.9, 2.10.5.10, 2.10.5.6)

Transformer and Wire /Insulation Electric Strength (2.10.5.13)

Steady Force (4.2.1 - 4.2.4)

Impact (4.2.5, 4.2.1, Part 22 10.2)

Heating (4.5.1, 1.4.12, 1.4.13)

Ball Pressure (4.5.5, 4.5)

Touch Current (Single-Phase; TN/TT System) (5.1, Annex D)

IT Touch Current (Single-Phase) (5.1, Annex D)

Electric Strength (5.2.2)

Component Failure (5.3.1, 5.3.4, 5.3.7)

Abnormal Operation (5.3.1 - 5.3.9)

Transformer Abnormal Operation (5.3.3, 5.3.7b, Annex C.1)

Summary of Compliance with National Differences:

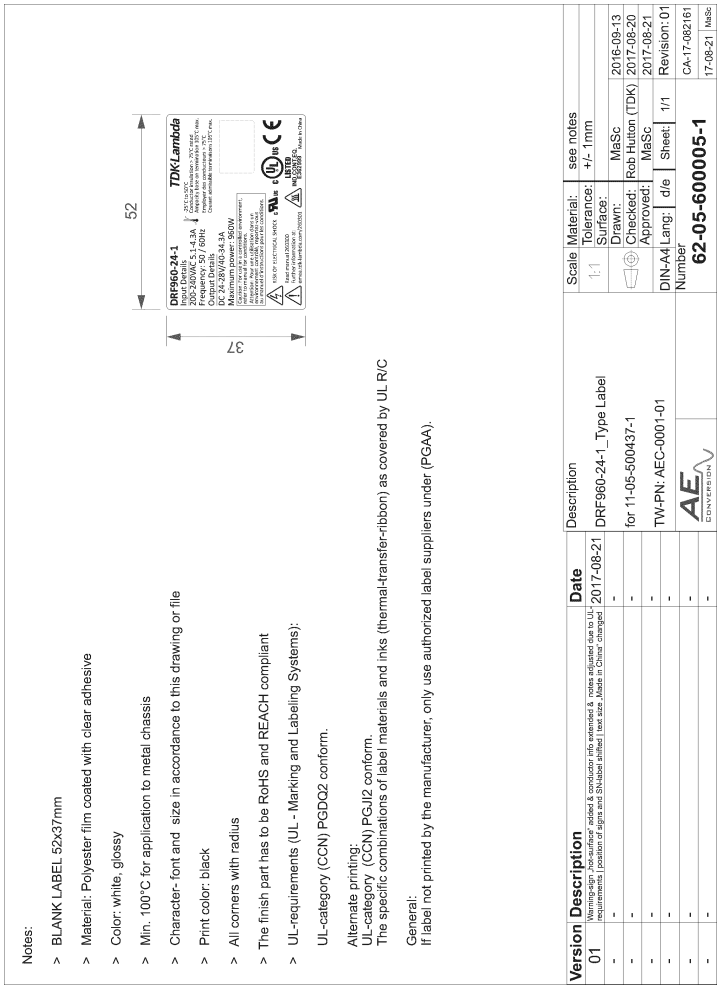
Countries outside the CB Scheme membership may also accept this report.

List of countries addressed: AR, AT, AU, BE, BG, BY, CA, CH, CN, CS, CZ, DE, DK, ES, EU, FI, FR, GB, GR, HU, IE, IL, IN, IT, JP, KR, MY, NL, NO, NZ, PL, PT, RO, SA, SE, SG, SI, SK, UA, US, ZA

The product fulfills the requirements of: N/A

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.



Test item particulars :		
Equipment mobility	:	for building-in
Connection to the mains	:	unit for building-in (filed wiring terminals used)
Operating condition	:	continuous
Access location	:	operator accessible
Over voltage category (OVC)	:	OVC II
Mains supply tolerance (%) or absolute mains supply values	:	180-264 Vac (+10%, -10%)
Tested for IT power systems	:	Yes
IT testing, phase-phase voltage (V)	:	230
Class of equipment	:	Class I (earthed)
Considered current rating of protective device as part of the building installation (A)	:	20
Pollution degree (PD)	:	PD 2
IP protection class	:	IP X0
Altitude of operation (m)	:	6 000
Altitude of test laboratory (m)	:	less than 2000 meters
Mass of equipment (kg)	:	1.62
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(s) of receipt of test item	:	2016-12-19, 2017-01-26, 2016-02-16, 2017-05-08, 2017-05-15, 2017-06-09, 2017-08-23
Date(s) of Performance of tests	:	2017-03-08 to 2017-06-30, 2017-09-13, 2017-09-18, 2017-10-20

General remarks:

"(see Enclosure #)" refers to additional information appended to the report.
"(see appended table)" refers to a table appended to the report.

Throughout this report a point is used as the decimal separator.

Manufacturer's Declaration per Sub Clause 4.2.5 of IECEE 02:

The application for obtaining a CB Test Certificate includes more than one factory 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 ..... Not Applicable

When differences exist, they shall be identified in the General Product Information section.

Name and address of Factory(ies): Huizhou Hui Energy Electronic Co Ltd
Bldg B8, Que Shui Yang Xie Section
Changbu Village
Xinxu Town, Huiyang District

Huizhou
Guangdong 516233 CHINA

GENERAL PRODUCT INFORMATION:

Report Summary

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

Product Description

The product is AC/DC switch mode power supply for building-in and mounting on DIN rail. It has output with adjustable voltage, passive relay signal circuit. Connector X2 may be used for external or remote control of the unit.

Model Differences

Suffix '-xyz' is optional and denotes customer-specific variant (like fixed voltage or no LED), and is deemed not safety relevant.

Additional Information

Product Maximum Normal load defined as full load according to output ratings up to 50 °C ambient and with linear de-rating above 50 °C and up to 70 °C ambient. See Technical Considerations.
Product additionally tested for intermittent operation at the following condition: 60 A for 4 seconds and 22.8 A for 7.4 seconds with rising edge min. 50ms.

External connector provided with 2 jumpers between pins 1-2 (CB OFF) and 5-6 (CNT on).

Overall dimensions [WxHxD] approximately: 110 x 123 x 139 mm.

Load conditions (output voltage and current) when referred as A through F are defined as follows:
A - at ambient = 50 °C, continuous load: 24 Vdc, 40 A
B - at ambient = 50 °C, continuous load: 28 Vdc, 34.3 A
C - at ambient = 70 °, de-rated continuous load: 24 Vdc, 30 A
D - at ambient = 70 °, de-rated continuous load: 28 Vdc, 25.725 A
E - at ambient = 60 °, de-rated continuous load: 24 Vdc, 35 A
F - at ambient 50 °C, Intermittent operation, 4 s high/7.4s low: 24 Vdc, 60/22.8 A

All tests have been conducted on samples with T2 construction employing S-238-HT-006 wire with 3 wrapped layers. Manufacturer has replaced TIW by 3-layer extruded wire type TXXL210/38FXXX-2, Rubadue with same electrical parameters considering tolerances. The overall dimension of T2 has not been changed. Based on test results in his evaluation and details of separate IEC certification of the wire itself and UL certified Insulating System new construction of T2 transformer is deemed not affecting previous test results and therefore all tests are considered representative for revised construction.

Technical Considerations

- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: 50 °C with full load, 70 °C with linear de-rating

above 50 °C down to 75% of full load

- The product is intended for use on the following power systems: TT, TN, IT
- The equipment disconnect device is considered to be: provided in end product
- The product was investigated to the following additional standards: EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 + A2:2013 (which includes all European national differences, including those specified in this test report).
- The following were investigated as part of the protective earthing/bonding: Printed wiring board trace (refer to Enclosure - Schematics + PWB for layouts)
- LEDs provided in the product are considered low power devices: Yes
- The following scope limitations apply to this test report and additional evaluation and/or tests may be required when submitting this CB Report to a National Certification Body (NCB) to obtain a national mark: - no EMC tests nor evaluation to EMC Directive 2004/108/EC and 2014/30/EU - no evaluation to RoHS Directives 2002/95/EC, 2011/65/EU and (EU) 2016/585 - only English version of markings/instructions provided and reviewed --
- The Clearances and Creepage Distances have additionally been assessed for suitability up to 6 000 m elevation: multiplying factor of 1.7 from Table A.2 of IEC 60664-1 was considered. --

Engineering Conditions of Acceptability

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

- The following Production-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-SELV: 370 Vrms, 600 Vpk, Primary-Earthed Dead Metal: 404 Vrms, 512 Vpk
- The following secondary output circuits are SELV: all output terminals
- The following secondary output circuits are at hazardous energy levels: power output terminal
- The following output terminals were referenced to earth during performance testing: ,
- The power supply terminals and/or connectors are: Suitable for field wiring
- 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: terminal XFIL1 pin 2
- 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): T2 (Class F/155 °C); T13 (class B/130 °C); L7, L8 (class F/155 °C)
- The following end-product enclosures are required: Mechanical, Fire, Electrical
- The following components require special consideration during end-product Thermal (Heating) tests due to the indicated maximum temperature measurements during component-level testing: metal housing/chassis (96.1 °C)
- Product tested for intermittent operation and adequate marking shall be provided in end-product if applicable. --
- Product provided with Fuse F1, rated 250 Vac, 10A. Adjacent marking or cross-reference may be considered necessary in end-product. --

Abbreviations used in the report:

- normal condition	N.C.	- single fault condition	S.F.C
- operational insulation	OP	- basic insulation	BI
- basic insulation between parts of opposite polarity:	BOP	- supplementary insulation	SI
- double insulation	DI	- reinforced insulation	RI

Indicate used abbreviations (if any)