



Test Report issued under the responsibility of:



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

Report Number: 1510057STO-001
Date of issue: 29 October 2015
Total number of pages: 82 pages

Applicant's name: TDK-Lambda Corporation
Address: 2704-1 Settaya-machi, Nagaoka-shi, Niigata, 940-1195 JAPAN

Test specification:

Standard: IEC 60950-1:2005 (Second Edition) + Am 1:2009 + Am 2:2013
Test procedure: CB Scheme
Non-standard test method: N/A

Test Report Form No: IEC60950_1F
Test Report Form(s) Originator: SGS Fimko Ltd
Master TRF: Dated 2014-02

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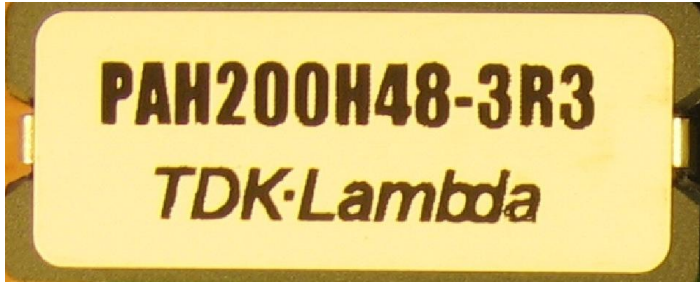

TEST REPORT issued by an Accredited Testing Laboratory. Accredited by Swedac, no 1003, ISO/IEC 17025.

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: DC-DC Converters
Trade Mark: TDK-Lambda
Manufacturer: TDK-Lambda Corporation
Model/Type reference: PAH200H48-1R2, PAH200H48-1R5, PAH200H48-1R8, PAH200H48-2R5, PAH200H48-3R3 (see also "Models" page 3)
Ratings: DC 36-76V (see also "Models" page 3)

Testing procedure and testing location:		
<input checked="" type="checkbox"/>	CB Testing Laboratory:	Intertek Semko AB
Testing location/ address		Torshamnsgatan 43, P.O. Box 1103, SE-164 22 Kista, SWEDEN
<input type="checkbox"/>	Associated CB Testing Laboratory:	
Testing location/ address		
Tested by (name + signature)		Bedran Nergiz 
Approved by (name + signature).....		Anna Karin Cedergren 
<input type="checkbox"/>	Testing procedure: TMP/CTF Stage 1:	
Testing location/ address		
Tested by (name + signature)		
Approved by (name + signature).....		
<input type="checkbox"/>	Testing procedure: WMT/CTF Stage 2:	
Testing location/ address		
Tested by (name + signature)		
Witnessed by (name + signature)		
Approved by (name + signature).....		
<input type="checkbox"/>	Testing procedure: SMT/CTF Stage 3 or 4:	
Testing location/ address		
Tested by (name + signature)		
Witnessed by (name + signature)		
Approved by (name + signature).....		
Supervised by (name + signature)		

Summary of testing:	
Tests performed (name of test and test clause): See test report	Testing location: See page 2
Summary of compliance with National Differences: <input checked="" type="checkbox"/> The product fulfils the requirements of EN 60950-1:2006+A11:2009+A1:2010+A12:2011+A2:2013. Group- and national differences for the CENELEC countries have been considered during the testing.	
Copy of marking plates: (examples) 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.	
	
	

Models included within the scope of this report						
Model	Input		Output	Current (A)		Power
	Vdc	A (typical)		Forced air	Convection	
-			Vdc	70A	35A	
PAH200H48-1R2	36-76Vdc	2.16A	1.2Vdc	70A	35A	84W
PAH200H48-1R5	36-76Vdc	2.63A	1.5Vdc	70A	35A	105W
PAH200H48-1R8	36-76Vdc	3.08A	1.8Vdc	70A	35A	126W
PAH200H48-2R5	36-76Vdc	4.23A	2.5Vdc	70A	35A	175W
PAH200H48-3R3	36-76Vdc	4.68A	3.3Vdc	60A	30A	198W

The models listed above may include one or more of the suffix's as shown below.
 /P : Positive ON/OFF control (Standard : Negative Logic)
 /V : Auto-restart OVP (Standard : Shutdown OVP)
 /C: Single output pin for V+ and V- module height 11.2mm (Standard: 2 output pins and 10.2mm height).
 /B: Base plate fitted to standard model.

Test item particulars.....:	
Equipment mobility.....:	<input type="checkbox"/> movable <input type="checkbox"/> hand-held <input type="checkbox"/> transportable <input type="checkbox"/> stationary <input checked="" type="checkbox"/> for building-in <input type="checkbox"/> direct plug-in
Connection to the mains.....:	<input type="checkbox"/> pluggable equipment <input type="checkbox"/> type A <input type="checkbox"/> type B <input checked="" type="checkbox"/> permanent connection <input type="checkbox"/> detachable power supply cord <input type="checkbox"/> non-detachable power supply cord <input type="checkbox"/> not directly connected to the mains
Operating condition.....:	<input checked="" type="checkbox"/> continuous <input type="checkbox"/> rated operating / resting time:
Access location	<input type="checkbox"/> operator accessible <input type="checkbox"/> restricted access location <input checked="" type="checkbox"/> for building into a host equipment
Over voltage category (OVC)	<input type="checkbox"/> OVC I <input checked="" type="checkbox"/> OVC II <input type="checkbox"/> OVC III <input type="checkbox"/> OVC IV <input type="checkbox"/> other:
Mains supply tolerance (%) or absolute mains supply values	Not applicable, Voltage range 36-76Vdc max.
Tested for IT power systems	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
IT testing, phase-phase voltage (V)	N/A
Class of equipment	<input checked="" type="checkbox"/> Class I <input type="checkbox"/> Class II <input type="checkbox"/> Class III <input type="checkbox"/> Not classified
Considered current rating of protective device as part of the building installation (A)	N/A (for building-in)
Pollution degree (PD)	<input type="checkbox"/> PD 1 <input checked="" type="checkbox"/> PD 2 <input type="checkbox"/> PD 3
IP protection class	IPX0
Altitude during operation (m)	<2000
Altitude of test laboratory (m)	<2000
Mass of equipment (kg)	<0.100
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.....	See "General remarks" below
Date of receipt of test item.....	See "General remarks" below
Date (s) of performance of tests.....	See "General remarks" below
General remarks:	
<p>"(See Enclosure #)" refers to additional information appended to the report. "(See appended table)" refers to a table appended to the report. The test results and all data in this report are derived from previously issued Test Report No. 1218082 dated 29 August 2012, issued by Intertek Semko AB. A new report has been issued due to update of the standard IEC 60950-1, to include Am 2: 2013. No additional test has been conducted. 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 IEC 60335-1:			
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 factories..... : TDK-Lambda (Malaysia) Sdn. Bhd. PLO33 Locked Bag No. 110 Kawasan Perindustrian Senai 81400 Senai Johor, Darul Takzim, MALAYSIA TDK-Lambda Corporation Nagaoka Technical Center 2704-1 Settaya-machi, Nagaoka, Niigata 940-1195 JAPAN Wuxi TDK-Lambda Electronics Co., Ltd. No.6 Xing Chuang Er lu Wuxi Jiangsu, 214028 CHINA			
Abbreviations used in the report:			
- normal conditions	N.C.	- single fault conditions	S.F.C
- functional insulation	OP	- basic insulation	BI
- double insulation	DI	- supplementary insulation	SI
- between parts of opposite polarity	BOP	- reinforced insulation	RI
Indicate used abbreviations (if any)			

This Test Report replaces previously issued, see table below.

REVISION TABLE

Date	Report ref.	Clause	Modification of the appliance
29 Oct. 2015	1510057STO-001	-	Basic Test Report

General Product Information:

- a) These products shall be installed in accordance with the requirements of IEC 60950-1:2005, EN 60950- 1:2006 for the end use application.
- b) This product was assessed for Basic insulation, material group IIIb at working voltage between input and output. All faults testing across the barriers were conducted under all input and output earth combinations.
- c) As a component part, compliance with the standard will be based upon installation in the final application. This product must be installed within host equipment.
- d) All dynamic testing was conducted with the units loaded to their specified output current.
- e) For the PAH200H48/B models it must be ensured the base plate temperature does not exceed 85°C at full load and 100°C at 50% load. For standard PAH200H48 models the end customer must ensure the component TH1 does not exceed 95°C. Assessment within this report has been done with airflow at maximum load and convection cooled at reduced load, maintaining TH1 at 95°C.
- f) The input to the units must be isolated from the mains by reinforced insulation in accordance with IEC 60950-1:2005, EN 60950- 1:2006 in order to maintain a SELV output.
- g) The input and output connectors are not acceptable for field wiring connections and are only intended for connection to a PCB inside the end use equipment.
- h) The recommended input fuse rating within the instructions and that used for all tests is as follows:- F10AH, 250V. The breaking capacity and voltage rating of this fuse maybe subject to the end use application.

Testing Environment:

Ambient temperature: 15°C to 30°C

Relative humidity: 25% to 75%

Air pressure: 86 kPa to 106 kPa