UL TEST REPORT AND PROCEDURE

Standard:	UL 62368-1, 2nd Ed, 2014-12-01 (Audio/video, information and communication technology equipment Part 1: Safety requirements) CAN/CSA C22.2 No. 62368-1-14, 2nd Ed-(Audio/video, information and communication technology equipment Part 1: Safety requirements)
Certification Type:	Component Recognition
CCN:	QQJQ2, QQJQ8 (Power Supplies for Use in Audio/Video, Information and Communication Technology Equipment)
Complementary CCN:	N/A
Product:	AC-DC Power Supply
Model:	Vega 450, Vega 650, Vega 900, Vega Lite 550 and Vega Lite 750 models (see enclosure MISC-Model Differences, 7-03, for details of models and nomenclature)
Rating:	Vega 450 and Vega Lite 550. PSUs with cooling option F and without xEW and xFW options: Input voltage: 94.5-240 V ac nom., (abs. 85-264 V ac)., 47-63 Hz, 8.5 A rms max. All other PSUs: Input voltage: 100-240 V ac nom., (abs. 90-264 V ac)., 47-63 Hz, 8.5 A rms max. Vega 650, Vega Lite 750 and Vega 900. PSUs with cooling option F and without xEW and xFW options: Input voltage: 94.5-240 V ac nom., (abs. 85-264 V ac), 47-63 Hz, 12 A rms max. All other PSUs: Input voltage: 100-240 V ac nom., (abs. 90-264 V ac)., 47-63 Hz, 11 A rms max. Input voltage for Vega 650 may also be rated 133-318V dc nom., (abs. 120-350V dc)., 10A max., for models described within Products covered, custom models. (See enclosure MISC-Model Differences, 7-03, for details of ratings)
Applicant Name and Address:	TDK-LAMBDA UK LTD KINGSLEY AVE ILFRACOMBE

EX34 8ES UNITED KINGDOM
UNITED KINGDOM

This is to certify that representative samples of the products covered by this Test Report have been investigated in accordance with the above referenced Standards. The products have been found to comply with the requirements covering the category and the products are judged to be eligible for Follow-Up Service under the indicated Test Procedure. The manufacturer is authorized to use the UL Mark on such products which comply with this Test Report and any other applicable requirements of UL LLC ('UL') in accordance with the Follow-Up Service Agreement. Only those products which properly bear the UL Mark are considered as being covered by UL's Follow-Up Service under the indicated Test Procedure.

The applicant is authorized to reproduce the referenced Test Report provided it is reproduced in its entirety.

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Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

Prepared By:	Piotr A. Bizunowicz / Project Handler	Reviewed By:	Dennis Butcher / Reviewer

Supporting Documentation

The following documents located at the beginning of this Procedure supplement the requirements of this Test Report:

A. Authorization - The Authorization page may include additional Factory Identification Code markings.

B. Generic Inspection Instructions -

i. Part AC details important information which may be applicable to products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of this Test Report.

ii. Part AE details any requirements which may be applicable to all products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of each Test Report.

iii. Part AF details the requirements for the UL Certification Mark which is not controlled by the technical standard used to investigate these products. Products are permitted to bear only the Certification Mark(s) corresponding to the countries for which it is certified, as indicated in each Test Report.

Product Description

Product Description –

Vega 450, Vega 650, Vega 900, Vega Lite 550 and Vega Lite 750 are switch mode power supply units for building into host equipment. There are essentially 2 converters (450 and 650) and all units use the same modules. The Vega 450 and 550 use the 450 converter whilst the Vega 650, 750 and 900 use the 650 converter.

The Vega series switch mode power supply consists of:

Main converter:

1. Input filter, consisting of the input fuse, X and Y capacitors, common mode chokes and series mode chokes up to the bridge.

2. PFC (boost circuit), consisting of the boost choke and associated switching FETs/circuitry.

3. Forward converter, consisting of the switching FETs/circuitry and of the main transformer supplying all modules.

4. Flyback transformer providing the auxiliary circuits and fan supply.

Outputs:

1. Standby circuit, consisting of the standby transformer and switching IC/circuitry supplying the standby outputs.

2. Secondary modules, all attaching to the main transformer. These may have various options.

Model Differences

Refer to enclosure 7-03

Test Item Particulars

Classification of use by	Skilled person
Supply Connection	AC Mains DC Mains
Supply % Tolerance	+10%/-10%
Supply Connection – Type	To be determined in End Use Application
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	To be determined in End Use Application
Pollution degree (PD)	PD 2
Manufacturer's specified maximum operating ambient (°C)	50 (See also enc.7-04 for derating information)
IP protection class	IPX0
Power Systems	TN TT dc mains
Altitude during operation (m)	5000m excluding IEC60320 inlet and/or cooling option D or E (Papst fan 622HH) which have rating of 3000 m
Altitude of test laboratory (m)	2000 m or less
Mass of equipment (kg)	2.7

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
- The product is intended for use on the following power systems : TN, TT, DC mains supply , (refer to model differences)
- Considered current rating of protective device as part of the building installation (A) : 20
- Mains supply tolerance (%) or absolute mains supply values : :+10%/-10% for AC and DC input
- The equipment disconnect device is considered to be : Appliance inlet for models with inlet, to be considered in End Use Application for other models
- 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 : Intallation/service manual, also in languages other than English, including French language for Canadian national difference.
- The product was investigated to the following additional standard : EN 62368-1:2014 + A11:2017, AS/NZS 62368.1:2018
- When the IEC inlet option is fitted (option I) together with a plastic fan grill then the end face of the PSU with the fan grill may be Ordinary Person (operator) accessible.

Engineering Conditions of Acceptability

For use only in or with complete equipment where the acceptability of the combination is determined by UL LLC. When installed in an end-product, consideration must be given to the following:

- The following product-line tests are conducted for this product : Earthing Continuity, Electric Strength
- The end-product Electric Strength Test is to be based upon a maximum working voltage of : AC mains supply Primary-Earthed Dead Metal: 298Vrms, 392Vpk , Primary-Secondary: 675Vpeak, 402Vrms., DC mains supply:- Primary to earth 560Vpk, 383Vrms. Primary to secondary, 588Vpeak, 393Vrms.
- The following output circuits are at ES1 energy levels : Refer to enclosure 7-03
- The following output circuits are at ES2 energy levels : Refer to enclosure 7-03
- The following output circuits are at ES3 energy levels : Refer to enclosure 7-03
- 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 : terminal "N"
- The following end-product enclosures are required : Mechanical, 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 (155), T2 (155), TX3 (155), TX1 (155), main transformer (155)
- The following components require special consideration during end-product Thermal (Heating) tests due to the indicated maximum temperature measurements during component-level testing : For cooling option C: TX1 (155°C) , main transformer (155°C), see also enclosure 7-04 for any custom cooling configuration or use outside ratings.
- The following input terminals were evaluated as suitable for direct connection to the DC Mains Supply : Input L,N - for models with DC rating
- The equipment is suitable for direct connection to : AC mains supply for models with IEC60320 appliance coupler
- The power supply was evaluated to be used at altitudes up to : 5000m, excluding the IEC60320 inlet and cooling options d and e which are rated up to 3000m
- The Endu Use fixings screw penetration require special attention: see handbook in enclosures for details

Additional Information

Refer to enclosure 7-04

Rating plates in Enclosure 13 are exemplary artwork. Due to modular nature of the products, it is impossible to include markings for all output ratings.

Additional Standards

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

Markings and Instructions

Clause Title	Marking or Instruction Details
Hazardous moving parts	"WARNING: Hazardous Moving Parts. Keep body parts out of the motion path."/"AVERTISSEMENT: Parties mobiles dangereuses. Se tenir à lécart de la zone de mouvement des parties mobiles."
Field wiring terminals - Conductor sizes to be connected	"Use _ AWG only"/“Utiliser _ AWG uniquement”