Ref. Certif. No.

US-23822-A1-M1-UL

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

SYSTEME CEI D'ACCEPTATION MUTUELLE DE CERTIFICATS D'ESSAIS DES EQUIPEMENTS ELECTRIQUES (IECEE) METHODE OC

CB TEST CERTIFICATE

CERTIFICAT D'ESSAI OC

Product Produit	Component Switching Power Supply
Name and address of the applicant Nom et adresse du demandeur	XP Power LLC, 15641 Red Hill Ave., Suite 100 Tustin, CA 92780 USA
Name and address of the manufacturer Nom et adresse du fabricant	XP Power LLC, 15641 Red Hill Ave., Suite 100 Tustin, CA 92780 USA
Name and address of the factory Nom et adresse de l'usine Note: *When more than one factory, please report on page 2* Note: *Lorsque il y plus d'une usine, veuillez utiliser la 2ème page*	XP Power LLC 990 Benecia Ave, Sunnyvale CA 94085 USA ☒ Additional Information on page 2
Ratings and principal characteristics Valeurs nominales et caractéristiques principales	100-240 Vac, 50/60 Hz, 1.2 A Output Rated: See test report for additional details
Trademark (if any) Marque de fabrique (si elle existe)	XP
Type of Manufacturer's Testing Laboratories used Type de programme du laboratoire d'essais constructeur	
Model / Type Ref. Ref. De type	ECS65USXX See Page 2
Additional information (if necessary may also be reported on page 2) Les informations complémentaires (si nécessaire,, peuvent être indiqués sur la 2ème page	National Differences specified in the CB Test Report. ☒ Additional Information on page 2
A sample of the product was tested and found to be in conformity with Un échantillon de ce produit a été essayé et a été considéré conforme à la	IEC 60601-1(ed.3), IEC 60601-1(ed.3);am1
As shown in the Test Report Ref. No. which forms part of this Certificate Comme indiqué dans le Rapport d'essais numéro de référence qui constitue partie de ce Certificat	4786488107-20111012 issued on 2015-01-14

This CB Test Certificate is issued by the National Certification Body
Ce Certificat d'essai OC est établi par l'Organisme **National de Certification**

☒ UL (US), 333 Pfingsten Rd IL 60062, Northbrook, USA
☐ UL (Demko), Borupvang 5A DK-2750 Ballerup, DENMARK
☐ UL (JP), Marunouchi Trust Tower Main Building 6F, 1-8-3 Marunouchi, Chiyoda-ku, Tokyo 100-0005, JAPAN
☐ UL (CA), 7 Underwriters Road, Toronto, M1R 3B4 Ontario, CANADA

For full legal entity names see www.ul.com/ncbnames

Date: 2015-03-18
Original Issue Date: 2014-08-26

Signature:

Jolanta M. Wroblewska

Ref. Certif. No.

US-23822-A1-M1-UL

Model Details:
ECS65USXX (where XX can be any number between 12 and 48 designating the output voltage), may also be provided with suffix "SF" and/or “B”, with or without “”

Factories:
XP Power (Kunshan) Limited.
230, Bin Jiang Nan Road, Zhang Pu Town, Kunshan, Jiangsu 215300
China

Additional Information:
Additionally evaluated to EN 60601-1:2006/ A1:2013

Reason for correction:
Correct EN standard

Additional information (if necessary)
Information complémentaire (si nécessaire)

- ☒ UL (US), 333 Pfingsten Rd IL 60062, Northbrook, USA
- ☐ UL (Demko), Borupvang 5A DK-2750 Ballerup, DENMARK
- ☐ UL (JP), Marunouchi Trust Tower Main Building 6F, 1-8-3 Marunouchi, Chiyoda-ku, Tokyo 100-0005, JAPAN
- ☐ UL (CA), 7 Underwriters Road, Toronto, M1R 3B4 Ontario, CANADA

For full legal entity names see www.ul.com/ncbnames

Date: 2015-03-18
Original Issue Date: 2014-08-26

Signature:
Jolanta M. Wroblewska

Test Report issued under the responsibility of:

IEC 60601-1
Medical electrical equipment
Part 1: General requirements for basic safety and essential performance

Report Reference No. .....:	4786488107-20111012
Date of issue .....:	2014 August 19, Correction 1: 2015 January 28
Total number of pages .....:	17
CB Testing Laboratory .....:	UL Camas
Address .....:	2600 NW Lake Rd., Camas, WA 98607, USA
Applicant's name .....:	XP Power LLC
Address .....:	15641 Red Hill Ave., Suite 100 Tustin, CA 92780 USA
Test specification:	
Standard .....:	IEC 60601-1: 2005 + CORR. 1:2006 + CORR. 2:2007 + AM1:2012 (or IEC 60601-1: 2012 reprint)
Test procedure .....:	CB Scheme
Non-standard test method……..:	
Test Report Form No. .....:	IEC60601_1J
Test Report Form Originator.....:	UL(US)
Master TRF .....:	2014-07

If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

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.....:	Component Switching Power Supply
Trade Mark .....:	
Manufacturer.....:	XP Power LLC, 15641 Red Hill Ave., Suite 100 Tustin, CA 92780 USA
Model/Type reference.....:	ECS65USXX (where XX is any number between 12-48 designating output voltage), may also be provided with suffix "SF" and/or "B", with or without ""
Ratings .....:	100-240 Vac, 50/60 Hz, 1.2 A Output Rated: See Model Differences for additional details

Testing procedure and testing location:			
☒	**CB Testing Laboratory:**		
Testing location/ address.....:		UL Camas 2600 NW Lake Road Camas, WA 98607 USA	
☐	**Associated CB Testing Laboratory:**		
Testing location/ address.....:			
Tested by (name + signature) .....:		Melissa DeGuia	
Approved by (name + signature) .....:		Timothy L. Gambrell	
☐	**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) ..... :			
Witnessed by (name + signature)..... :			
Approved by (name + signature) ..... :			
Supervised by (name + signature)..... :			

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

Summary of testing:

Unless otherwise indicated, all tests were conducted at XP Power LLC, 1241 E. Dyer Rd #150, Santa Ana, CA 92705, USA

All testing conducted under the Applicant's IEC 60601-1, 3rd Ed under CB Test Report 11CA34108 and CB Certificate US-17857-UL, dated 2011-10-14. The tests conducted per 3rd ed of IEC 60601-1 were considered representative of the corresponding tests required by 3rd ed of IEC 60601-1+AM1

Tests performed (name of test and test clause):	**Testing location:**
Input Test (4.11) Humidity Preconditioning Treatment (5.7) Limitation of Voltage, Current or Energy (8.4.3 & 8.4.4) Earth Leakage Current (8.7) Working Voltage Measurement (8.5.4) Dielectric Voltage Withstand (8.8.3) Ball Pressure (8.8.4.1) Temperature Test (11.1) Abnormal Operation and Single Fault Conditions (13.2) Mains Transformers (short and overload) (15.5, 13.2.3)	XP Power LLC, 1241 E. Dyer Rd #150, Santa Ana, CA 92705, USA

Summary of compliance with National Differences

List of countries addressed:

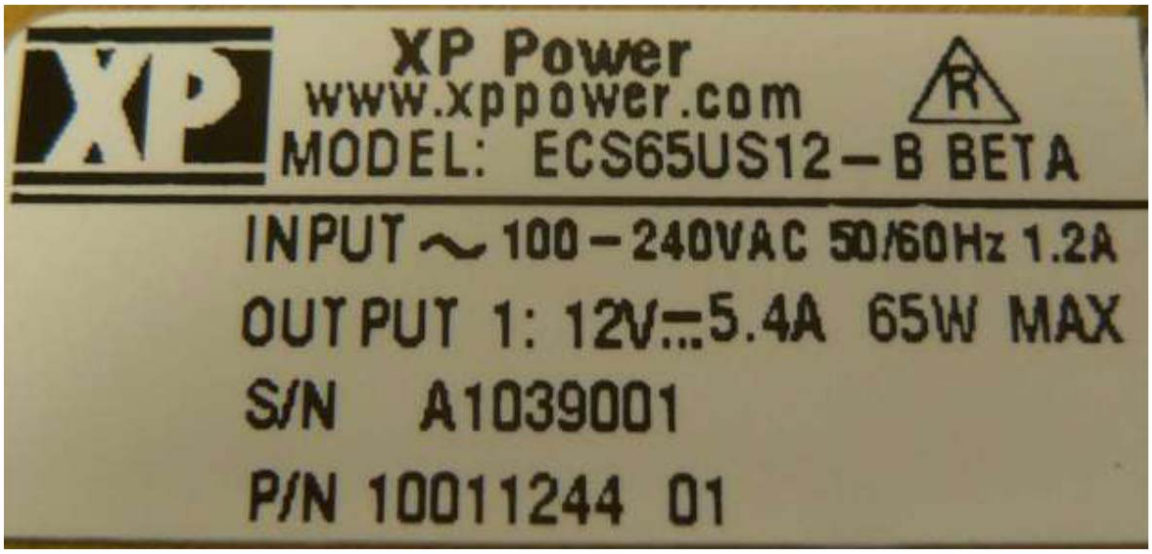
US, CAN, AUSTRIA, REPUBLIC OF KOREA, SWEDEN and UNITED KINGDOM

☒ The product fulfils the requirements of IEC 60601-1, Edition 3.1 (2012)

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.

Labels provided are considered representative of the entire series



GENERAL INFORMATION	
Test item particulars (see also Clause 6):	
Classification of installation and use ..... :	Building-in
Device type (component/sub-assembly/ equipment/ system) :	Component power supply
Intended use (Including type of patient, application location) :	To supply regulated power
Mode of operation ..... :	Continuous
Supply connection	To be determined in the end product
Accessories and detachable parts included ..... :	N/A
Other options include ..... :	N/A
Testing	
Date of receipt of test item(s) ..... :	2010-06-23
Dates tests performed ..... :	2010-07-01 to 2010-10-13; 2011-07-18, 2011-09-15 to 2011-09-21
Possible test case verdicts:	
- test case does not apply to the test object ..... :	N/A
- test object does meet the requirement ..... :	Pass (P)
- test object was not evaluated for the requirement ..... :	N/E (collateral standards only)
- test object does not meet the requirement ..... :	Fail (F)
Abbreviations used in the report:	
- normal condition ..... : N.C.	- single fault condition .....: S.F.C.
- means of Operator protection ..... : MOOP	- means of Patient protection ....: MOPP

General remarks:

"(See Attachment #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.
The tests 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 testing laboratory.
List of test equipment must be kept on file and available for review.
Additional test data and/or information provided in the attachments to this report.

Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:2012

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 .....:	☒ **Yes** ☐ **Not applicable**

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

Name and address of factory (ies) ..... :	XP Power LLC, 990 Benecia Ave, Sunnyvale CA 94085, USA XP Power (Kunshan) Limited., 230, Bin Jiang Nan Road, Zhang Pu Town, Kunshan, Jiangsu 215300 China

General product information:

Report Summary

Correction 1 Report:

The original report was modified on 2015-01-28 to include the following changes/additions:

1. Correction to Table 8.10 to add in alternate components which were left out of Amendment 1. No testing deemed necessary based on the similarities to previously evaluated construction.

Amendment 1 Report:

The original report was modified on 2015-01-14 to include the following changes/additions:

1. No additional testing was deemed necessary to add alternate PWB layout for Model ECS60US24 which is a larger size PWB and addition of a plastic post located adjacent to components designated, RT1 and C9.

2. No additional testing was needed to add alternate Connector (J1) by Molex, Type 41791 series (P/N 26-60-4030) and alternate Connector (J2) by Molex, Type 41791 sereis (P/N 26-60-4060) based on similarities to previously evaluated components.

3. Update Applicant and Manufacturer address from Santa Ana, CA to Tustin, CA.

Product Description
Products covered are open frame power supplies intended for building-in to be used with Medical Electrical Equipment. Units are intended for used with Class I or Class II end-products.

Model Differences

All models in the Model ECS65USXX series are identical with exception to the Mains Transformer, T1, and minor secondary components that allow for different output voltage ratings. See below for Model Ratings for up to 50°C ambient:

Model ECS65US12: Output Rated: 10.1 Vdc to 13.5 Vdc, 5.4 A Max (65W Max)
Model ECS65US15: Output Rated: 13.6 Vdc to 17 Vdc, 4.3 A Max (65 W Max)
Model ECS65US18: Output Rated: 17.1 Vdc to 21 Vdc, 3.4 A Max (65 W Max)
Model ECS65US24: Output Rated: 21.1 Vdc to 26 Vdc, 2.7 A Max (65 W Max)
Model ECS65US28: Output Rated: 26.1 Vdc to 31 Vdc, 2.3 A Max (65 W Max)
Model ECS65US33: Output Rated: 31.1 Vdc to 33 Vdc, 2.0 A Max (65 W Max)
Model ECS65US36: Output Rated: 33.1 Vdc to 42 Vdc, 1.8 A Max (65 W Max)
Model ECS65US48: Output Rated: 42.1 Vdc to 54 Vdc, 1.4 A Max (65 W Max)

See Enclosures 7-01 and 7-02 for de-rating curve for ambient temperatures up to 70°C.
Suffix "SF" indicates single fuse provided in the line side of the primary.
Suffix "-B" indicates unit provided with optional EMI Inductor, L2.

Additional Information

No additional testing was deemed necessary to evaluate the models covered under this Report to IEC 60601-1, Edition 3 with Am.1. based on previously conducted testing and the review of product technical documentation including photos, schematics, wiring diagrams, etc. conducted under separate CB Scheme investigation to IEC 60601-1, 3rd ed issued under CBTR No. 11CA34108 and CB Certificate US-17857-UL,

dated 2011-10-14.
The output ranges and the alternate capacitor (C1) by Xiamen Faratronic Co Ltd., Type MKP61R (C40 Series) were also added.

The schematics are kept on file at the CBTL and can be provided by the manufacturer upon request by NCB's/CBTL's.

When submitting this Test Report to other Certification Body, the manufacturer is responsible for providing any additional information that the Body may need in order to issue its Mark, including testing for compliance with the applicable collateral standards.

Manufacturer to provide up to date IEC Licensed for component licenses greater than 3 years upon request. The need for the additional testing and evaluation shall be determined in the end product investigation.

Technical Considerations

- The product was investigated to the following additional standards: ANSI/AAMI ES60601-1:2005/C1:2009 +AM1(R2012) (includes National Differences for USA); CAN/CSA-C22.2 No. 60601-1:14 (includes National Differences for Canada), EN 60601-1:2006+A1 (2013)

- The product is evaluated only to the following hazards: Casualty, Fire, Shock

- The degree of protection against harmful ingress of water is: Ordinary

- Software is relied upon for meeting safety requirements related to mechanical, fire and shock: No

- The power supply was evaluated for use in 50°C ambient at Full Rated Output and 50% of the Rated Output in 70°C ambient. (See De-rating Curve, Enclosure 7-01 for details)

Risk Controls/ Engineering Condition of Acceptability

- The component shall be considered for compliance with the Marking (clause 7) and Separation (clause 8) requirements as part of the end use application evaluation.

- Repeat of leakage current testing and consideration of non-frequency weighted leakage current test (Clause 8.7.3e) shall be considered in the end product application.

- This power supply was evaluated with Two MOPP between Primary and Secondary; One MOPP primary and Earth/Secondary Reference Conductor; and One MOPP between Secondary and Earth/ Secondary Reference Conductor.

- This power supply has been evaluated as a continuous operation, ordinary equipment and has not been evaluated for use in the presence of a flammable anesthetic mixture with air, oxygen, or nitrous oxide. The output circuits have not been evaluated for direct patient connection (Type B, BF or CF).

- The end product shall ensure that the requirements related to accompanying documents, clause 7.9, are met.

- The available voltage for the secondary outputs does not exceed 25 Vac or 60 Vdc, under normal and single fault conditions.

- The following secondary output circuits are at non-hazardous energy levels: All outputs

- The output connectors are not acceptable for field connections; they are only intended for connection to mating connectors of the end-use equipment.

- The maximum investigated branch circuit rating is: 20 A

- The Electric Strength Test conducted on this power supply was based upon a maximum working voltage of: Primary-Earthed Dead Metal (Class I units): 359 Vpk, 244 Vrms; Primary-SEC: 588 Vpk, 249 Vrms.

- When installed in a Class I end product, the power supply shall be mounted in a manner that provides, at a minimum, 2.5 mm Clearance/4 mm Creepage between the primary sides of power supply and protectively earthed accessible conductive parts. In addition, when installed in a Class I end product, the protective bonding terminal of the power supply shall be reliably connected to the main protective earthing terminal of the end product.

- When installed in a Class II end product, the power supply shall be mounted, on insulating posts, in a manner that provides, at a min. 5 mm Clearance/8 mm Creepage between the power supply and any accessible conductive parts**.**

- An investigation of the protective bonding terminal has: Not been conducted.

- For Class I application: Protective bonding testing shall be considered in the end product application.

- Primary side heat sinks are floating and considered live. They should not be accessible in the endproduct.

- 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): L1-L2 and T1 (Class F, 155°C)

- Printed Wiring Board rated 130°C.

- Cleaning test shall be considered as part of end product evaluation.

- The need for Marking Durability and Marking Legibility Testing shall be considered as part of the end product installation.

- Fire/ Mechanical/ Electrical Enclosure to be provided as part of the end product.

- Unit provided with additional suffix "-SF" are provided with only one fuse in the line side. Consideration for the need for additional fusing to be provided as part of the end product

Ref. Certif. No.

US-22581-UL

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

SYSTEME CEI D'ACCEPTATION MUTUELLE DE CERTIFICATS D'ESSAIS DES EQUIPEMENTS ELECTRIQUES (IECEE) METHODE OC

CB TEST CERTIFICATE

CERTIFICAT D'ESSAI OC

Product Produit	Switching Power Supply
Name and address of the applicant Nom et adresse du demandeur	XP POWER L L C Suite 150 1241 E DYER RD Santa Ana, CA 92705 USA
Name and address of the manufacturer Nom et adresse du fabricant	XP POWER L L C Suite 150 1241 E DYER RD Santa Ana, CA 92705 USA
Name and address of the factory Nom et adresse de l'usine Note: *When more than one factory, please report on page 2* Note: *Lorsque il y plus d'une usine, veuillez utiliser la 2ème page*	XP POWER (KUNSHAN) LTD 230 BIN JIANG NAN RD ZHANGPU TOWN KUNSHAN, 215300 JIANGSU China ☒ Additional Information on page 2
Ratings and principal characteristics Valeurs nominales et caractéristiques principales	Input: 100-240 Vac, 1.2 A, 50/60 Hz Output: See Test Report - Enclosure - Miscellaneous Ratings Table for details.
Trademark (if any) Marque de fabrique (si elle existe)	XP
Type of Manufacturer's Testing Laboratories used Type de programme du laboratoire d'essais constructeur	WMT
Model / Type Ref. Ref. De type	ECS65USXX See Page 2
Additional information (if necessary may also be reported on page 2) Les informations complémentaires (si nécessaire,, peuvent être indiqués sur la 2ème page	Additionally evaluated to EN 60950-1:2006/ A11:2009/ A1:2010/ A12:2011; National Differences specified in the CB Test Report. ☐ Additional Information on page 2
A sample of the product was tested and found to be in conformity with Un échantillon de ce produit a été essayé et a été considéré conforme à la	IEC 60950-1(ed.2), IEC 60950-1(ed.2);am1
As shown in the Test Report Ref. No. which forms part of this Certificate Comme indiqué dans le Rapport d'essais numéro de référence qui constitue partie de ce Certificat	E139109-A131-CB-1 issued on 2013-11-27

This CB Test Certificate is issued by the National Certification Body
Ce Certificat d'essai OC est établi par l'Organisme **National de Certification**

☒ UL (US), 333 Pfingsten Rd IL 60062, Northbrook, USA
☐ UL (Demko), Borupvang 5A DK-2750 Ballerup, DENMARK
☐ UL (JP), Marunouchi Trust Tower Main Building 6F, 1-8-3 Marunouchi, Chiyoda-ku, Tokyo 100-0005, JAPAN
☐ UL (CA), 7 Underwriters Road, Toronto, M1R 3B4 Ontario, CANADA

For full legal entity names see www.ul.com/ncbnames

Date: 2013-11-27

Signature:

Jolanta M. Wroblewska

Ref. Certif. No.

US-22581-UL

Model Details:
ECS65USXX (where XX can be any number between 12 and 48 designating the output voltage), may also be provided with suffix "SF" and/or "-B"

Factories:

XP POWER L L C
990 BENECIA AVE
SUNNYVALE, CA 94085 United States

Additional information (if necessary)
Information complémentaire (si nécessaire)

- [x] UL (US), 333 Pfingsten Rd IL 60062, Northbrook, USA
- [ ] UL (Demko), Borupvang 5A DK-2750 Ballerup, DENMARK
- [ ] UL (JP), Marunouchi Trust Tower Main Building 6F, 1-8-3 Marunouchi, Chiyoda-ku, Tokyo 100-0005, JAPAN
- [ ] UL (CA), 7 Underwriters Road, Toronto, M1R 3B4 Ontario, CANADA

For full legal entity names see www.ul.com/ncbnames

Date: 2013-11-27

Signature:

Jolanta M. Wroblewska

Test Report issued under the responsibility of:

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

Report Reference No ..... :	E139109-A131-CB-1
Date of issue ..... :	2013-11-27
Total number of pages ..... :	71
CB Testing Laboratory ..... :	UL San Jose
Address ..... :	455 E. Trimble Rd., San Jose, CA, 95131-1230, USA
Applicant's name ..... :	XP POWER L L C
Address ..... :	SUITE 150 1241 E DYER RD SANTA ANA CA 92705 UNITED STATES
Test specification:	
Standard ..... :	IEC 60950-1:2005 (2nd Edition); Am 1:2009
Test procedure ..... :	CB Scheme
Non-standard test method ..... :	N/A
Test Report Form No. ..... :	IEC60950_1C
Test Report Form originator ..... :	SGS Fimko Ltd
Master TRF ..... :	2012-08

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.

Test item description ..... :	Switching Power Supply
Trade Mark ..... :	
Manufacturer ..... :	XP POWER LLC SUITE 150 1241 E DYER RD SANTA ANA CA 92705 UNITED STATES
Model/Type reference ..... :	ECS65USXX (where XX can be any number between 12 and 48 designating the output voltage), may also be provided with suffix "SF" and/or "-B"
Ratings ..... :	Input: 100-240 Vac, 1.2 A, 50/60 Hz Output: See Enclosure - Miscellaneous Ratings Table for details.

Testing procedure and testing location:			
[ ]	**CB Testing Laboratory**		
	Testing location / address..... :		
[ ]	**Associated CB Test Laboratory**		
	Testing location / address..... :		
	Tested by (name + signature) ..... :		
	Approved by (name + signature) ... :		
[ ]	**Testing Procedure: TMP**		
	Tested by (name + signature) ..... :		
	Approved by (+ signature) ..... :		
	Testing location / address..... :		
[x]	**Testing Procedure: WMT**		
	Tested by (name + signature) ..... :	Chin Chee Siang	
	Witnessed by (+ signature)..... :	CheeBeng Wai	
	Approved by (+ signature) ..... :	David E. Drewes	
	Testing location / address..... :	XP Power Ltd / 401 Commonwealth Drive, Haw Par Technocentre, Lobby B, #02-02, Singapore 149598	
[ ]	**Testing Procedure: SMT**		
	Tested by (name + signature) ..... :		
	Approved by (+ signature) ..... :		
	Supervised by (+ signature) ..... :		
	Testing location / address..... :		
[ ]	**Testing Procedure: RMT**		
	Tested by (name + signature) ..... :		
	Approved by (+ signature) ..... :		
	Supervised by (+ signature) ..... :		
	Testing location / address..... :		

List of Attachments

National Differences (41 pages)

Enclosures (110 pages)

Summary Of Testing

Unless otherwise indicated, all tests were conducted at XP Power Ltd / 401 Commonwealth Drive, Haw Par Technocentre, Lobby B, #02-02, Singapore 149598.

	Tests performed (name of test and test clause)	**Testing location / Comments**
	Guide Information Page - Maximum Output Voltage,	

Current, and Volt Ampere Measurement (1.2.2.1)

Input: Single-Phase (1.6.2)

Energy Hazard Measurements (2.1.1.5, 2.1.2, 1.2.8.10)

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 Current Circuit Measurement (2.4.1, 2.4.2)

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)

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)

Electric Strength (5.2.2)

Component Failure (5.3.1, 5.3.4, 5.3.7)

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

Power Supply Output Short-Circuit/Overload (5.3.7)

Summary of Compliance with National Differences:

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

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

The product fulfills the requirements of: CSA C22.2 No. 60950-1-07 + A1:2011, EN 60950-1:2006 + A1:2010 + A11:2009 + A12:2011, UL 60950-1 2nd Ed. Revised 2011-12-19, IEC 60950-1:2005 + A1:2009

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

Test item particulars :	
Equipment mobility ..... :	for building-in
Connection to the mains ..... :	To be determined in the end-use product.
Operating condition ..... :	continuous
Access location ..... :	To be determined in the end-use product.
Over voltage category (OVC) ..... :	OVC II
Mains supply tolerance (%) or absolute mains supply values ..... :	+10%, -10%
Tested for IT power systems ..... :	Yes
IT testing, phase-phase voltage (V) ..... :	230
Class of equipment ..... :	Class I or Class II (Determined by end product)
Considered current rating of protective device as part of the building installation (A) ..... :	20 A
Pollution degree (PD) ..... :	PD 2
IP protection class ..... :	IPX0
Altitude of operation (m) ..... :	5000
Altitude of test laboratory (m) ..... :	less than 2000 meters
Mass of equipment (kg) ..... :	0.25 kg
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 ..... :	2013-11-04
Date(s) of Performance of tests ..... :	2013-11-05 to 2013-11-15
General remarks:	
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 testing laboratory. "(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:	Yes
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 ..... When differences exist, they shall be identified in the General Product Information section.	
Name and address of Factory(ies):	XP POWER L L C 990 BENECIA AVE SUNNYVALE CA 94085

UNITED STATES

XP POWER (KUNSHAN) LIMITED
230, BIN JIANG NAN ROAD,
ZHANG PU TOWN
KUNSHAN,
JIANGSU 215300 CHINA

GENERAL PRODUCT INFORMATION:

Report Summary

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

Product Description

The model covered in this report is a component power supply intended for use in Information Technology Equipment. It is an open frame power supply intended for building-in Class I or Class II end-products. Double insulated symbol is optionally provided. Earthing symbol may only be provided for Class I power supplies.

Model Differences

All models in the Model ECS65USXX series are identical with exception to the Mains Transformer, T1, and minor secondary components that allow for different output voltage ratings. See below for Model Ratings Table for 50°C ambient below:

Model ECS65US12: Output Rated: 12 Vdc, 5.4 A
Model ECS65US15: Output Rated: 15 Vdc, 4.3 A
Model ECS65US18: Output Rated: 18 Vdc, 3.6 A
Model ECS65US24: Output Rated: 24 Vdc, 2.7 A
Model ECS65US28: Output Rated: 28 Vdc, 2.3 A
Model ECS65US48: Output Rated: 48 Vdc, 1.35 A

See Enclosure - Miscellaneous for de-rating tables.

Additional Suffix "SF" denotes units provided with only a single line side fuse.

Additional Suffix "-B" denotes units provided with additional EMI filter inductor, L2.

Additional Information

The clearance distances have additionally been assessed for suitability up to 5000 m elevation (1.48 correction factor as per IEC 60664-1, Table A2).

The need for the additional testing and evaluation shall be determined in the end product investigation.

The nameplate markings provided as an Enclosure - Marking Plate are considered representative of the entire series.

The power supply series covered by this report employ Double/Reinforced Insulation between Primary and Secondary circuits.

When installed in a Class I end product, the power supply shall be mounted in a manner that provides, at a minimum, 2.3 mm Clearance between the primary side of power supply and protectively earthed accessible conductive parts. In addition, when installed in a Class I end product, the protective bonding terminal of the power supply shall be reliably connected to the main protective earthing terminal of the end product.

When installed in a Class II end product, the power supply shall be mounted, on insulating posts, in a manner that provides, at a min. 4 mm Clearance between the power supply and any accessible conductive parts.

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 at full rated load and 70°C at half rated load (See Enclosure - Miscellaneous for de-rating curve details).
- The means of connection to the mains supply is: for building-in, to be determined in the end product.
- The product is intended for use on the following power systems: IT, TN
- The product was investigated to the following additional standards: EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 (which includes all European national differences, including those specified in this test report).
- The following accessible locations (with circuit/schematic designation) are within a limited current circuit: Load side of C29
- Power supplies covered by this report were evaluated for both Class I and Class II (double insulated). Double insulated symbol is optionally provided. See Conditions of Acceptability for insulation required for Class II. Earthing symbol may only be provided for Class I power supplies. --

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
- The end-product Electric Strength Test is to be based upon a maximum working voltage of: Primary-Earthed Dead Metal: 241 Vrms, 359 Vpk, Primary-SELV: 252 Vrms, 601 Vpk,
- The following secondary output circuits are SELV: All outputs.
- The following secondary output circuits are at non-hazardous energy levels: All outputs.
- The following output terminals were referenced to earth during performance testing: Secondary Output (J2) referenced using "Y1" or "Y2" capacitors.
- The power supply terminals and/or connectors are: Suitable for factory wiring only
- 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 when the power supply is used in a Class I end product. The power supply will be considered Class II only when protection against electric shock does not rely on Basic Insulation and provides a minimum of 5 mm creepage and 4 mm clearance distance between Primary and SEC components (mounted above chassis/accessible metal parts on Insulating posts etc). Class II units have no reliance upon protective earthing.,
- An investigation of the protective bonding terminals has: Not been conducted
- The following input terminals/connectors must be connected to the end-product supply neutral: ACN J1

- 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): L1, L2, L3 and T1 (Class F, 155°C)
- The following end-product enclosures are required: Mechanical, Fire, Electrical
- Printed Wiring Board rated 130°C. --
- The equipment is provided with a fuse in both the Line and Neutral of the primary circuit, unless provided with suffix "SF" to indicate only one fuse provided in the Line. --
- Primary side heat sinks are floating and considered live. They should not be accessible in the end-product. --
- Touch Current test to be conducted in the end-product evaluation. --
- Clearance spacing evaluated for 3048 m altitude. Additional consideration maybe necessary in the end-use product. --
- Units provided with fuses in the line and neutral shall be considered for the need for "Double Pole Fusing" warning markings as part of the 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)

Ref. Certif. No.

US-24061-A1-UL

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

SYSTEME CEI D'ACCEPTATION MUTUELLE DE CERTIFICATS D'ESSAIS DES EQUIPEMENTS ELECTRIQUES (IECEE) METHODE OC

CB TEST CERTIFICATE

CERTIFICAT D'ESSAI OC

Product Produit	Component Switching Power Supply
Name and address of the applicant Nom et adresse du demandeur	XP Power LLC 15641 Red Hill Ave., Ste 100, Tustin, CA 92780, USA
Name and address of the manufacturer Nom et adresse du fabricant	XP Power LLC, 15641 Red Hill Ave., Ste 100, Tustin, CA 92780, USA
Name and address of the factory Nom et adresse de l'usine Note: *When more than one factory, please report on page 2* Note: *Lorsque il y plus d'une usine, veuillez utiliser la 2ème page*	XP Power LLC 990 Benecia Ave, Sunnyvale CA 94085 USA ☒ Additional Information on page 2
Ratings and principal characteristics Valeurs nominales et caractéristiques principales	100-240 Vac, 50/60 Hz, 1.9 A Output Rated: See Model Differences for additional details
Trademark (if any) Marque de fabrique (si elle existe)	XP
Type of Manufacturer's Testing Laboratories used Type de programme du laboratoire d'essais constructeur	
Model / Type Ref. Ref. De type	ECS100USXX See Page 2
Additional information (if necessary may also be reported on page 2) Les informations complémentaires (si nécessaire,, peuvent être indiqués sur la 2ème page	National Differences specified in the CB Test Report. ☒ Additional Information on page 2
A sample of the product was tested and found to be in conformity with Un échantillon de ce produit a été essayé et a été considéré conforme à la	IEC 60601-1(ed.3), IEC 60601-1(ed.3);am1
As shown in the Test Report Ref. No. which forms part of this Certificate Comme indiqué dans le Rapport d'essais numéro de référence qui constitue partie de ce Certificat	4786488107-20111004 issued on 2015-02-16

This CB Test Certificate is issued by the National Certification Body
Ce Certificat d'essai OC est établi par l'Organisme **National de Certification**

☒ UL (US), 333 Pfingsten Rd IL 60062, Northbrook, USA
☐ UL (Demko), Borupvang 5A DK-2750 Ballerup, DENMARK
☐ UL (JP), Marunouchi Trust Tower Main Building 6F, 1-8-3 Marunouchi, Chiyoda-ku, Tokyo 100-0005, JAPAN
☐ UL (CA), 7 Underwriters Road, Toronto, M1R 3B4 Ontario, CANADA

For full legal entity names see www.ul.com/ncbnames

Date: 2015-02-18
Original Issue Date: 2014-10-13

Signature:

Jolanta M. Wroblewska

Ref. Certif. No.

US-24061-A1-UL

Model Details:

ECS100USXX (where XX is any number between 12-48 designating output voltage), may also be provided with suffix "SF", with or without "-".

Factories:

XP Power (Kunshan) Limited.,
230, Bin Jiang Nan Road, Zhang Pu Town, Kunshan, Jiangsu 215300
China

Additional Information:

The original report was modified to include the following changes/additions:
Updated the Applicant and Manufacturer address and added alternate component. See Test Report for more details.

Additional information (if necessary)
Information complémentaire (si nécessaire)

☒ UL (US), 333 Pfingsten Rd IL 60062, Northbrook, USA
☐ UL (Demko), Borupvang 5A DK-2750 Ballerup, DENMARK
☐ UL (JP), Marunouchi Trust Tower Main Building 6F, 1-8-3 Marunouchi, Chiyoda-ku, Tokyo 100-0005, JAPAN
☐ UL (CA), 7 Underwriters Road, Toronto, M1R 3B4 Ontario, CANADA

For full legal entity names see www.ul.com/ncbnames

Date: 2015-02-18
Original Issue Date: 2014-10-13

Signature:

Jolanta M. Wroblewska

Test Report issued under the responsibility of:

IEC 60601-1
Medical electrical equipment
Part 1: General requirements for basic safety and essential performance

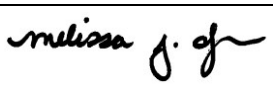
Report Reference No.....:	4786488107-20111004
Date of issue .....:	2014-10-13; Amendment 1: 2015-02-16
Total number of pages.....:	19
CB Testing Laboratory.....:	UL Camas
Address .....:	2600 NW Lake Rd., Camas, WA 98607, USA
Applicant's name.....:	XP Power LLC
Address .....:	15641 Red Hill Ave., Ste 100, Tustin, CA 92780 USA
Test specification:	
Standard .....:	IEC 60601-1: 2005 + CORR. 1:2006 + CORR. 2:2007 + AM1:2012 (or IEC 60601-1: 2012 reprint)
Test procedure.....:	CB Scheme
Non-standard test method……..:	
Test Report Form No.....:	IEC60601_1J
Test Report Form Originator .....:	UL(US)
Master TRF .....:	2014-07

If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

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 .....:	Component Switching Power Supply	
Trade Mark .....:		
Manufacturer.....:	XP Power LLC, 15641 Red Hill Ave., Ste 100, Tustin, CA 92780 USA	
Model/Type reference.....:	ECS100USXX (where XX is any number between 12-48 designating output voltage), may also be provided with suffix "SF", with or without "-".	
Ratings.....:	100-240 Vac, 50/60 Hz, 1.9 A Output Rated: See Model Differences for additional details	
Testing procedure and testing location:		
☒ **CB Testing Laboratory:**		
Testing location/ address	UL Camas 2600 NW Lake Road, Camas, WA 98607 USA	
☐ **Associated CB Testing Laboratory:**		
Testing location/ address		
Tested by (name + signature).....	Melissa DeGuia	
Approved by (name + signature)	Michael J. Howell	
☐ **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).....		
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 (9 pages)

Enclosure (68 pages)

Summary of testing:

Unless otherwise indicated, all tests were conducted at

UL Camas
2600 NW Lake Road, Camas, WA 98607 USA

All testing conducted under the Applicant's IEC 60601-1, 3rd Ed under CB Test Report 11CA37885 and CB Certificate US-17807-UL. The tests conducted per 3rd ed of IEC 60601-1 were considered representative of the corresponding tests required by IEC 60601-1: 2012, Edition 3.1

Tests performed (name of test and test clause):	**Testing location:**
No testing conducted	No testing conducted

Summary of compliance with National Differences

List of countries addressed:

US, CAN, AUSTRIA, REPUBLIC OF KOREA, SWEDEN and UNITED KINGDOM

☒ The product fulfils the requirements of IEC 60601-1, Edition 3.1 (2012)

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.

Labels provided are considered representative of the entire series

See Marking Plate ID 13-01. Note – "BETA" is not to be provided on the final label to be applied to the device.

GENERAL INFORMATION	
Test item particulars (see also Clause 6):	
Classification of installation and use ..... :	Building-in
Device type (component/sub-assembly/ equipment/ system):	Component power supply
Intended use (Including type of patient, application location) :	To supply regulated power
Mode of operation .....:	Continuous
Supply connection	To be determined in the end product
Accessories and detachable parts included.....:	N/A
Other options include .....:	N/A
Testing	
Date of receipt of test item(s) .....:	N/A
Dates tests performed .....:	N/A
Possible test case verdicts:	
- test case does not apply to the test object .....:	N/A
- test object does meet the requirement.....:	Pass (P)
- test object was not evaluated for the requirement ..... :	N/E (collateral standards only)
- test object does not meet the requirement.....:	Fail (F)
Abbreviations used in the report:	
- normal condition .....: N.C.	- single fault condition.....: S.F.C.
- means of Operator protection .....: MOOP	- means of Patient protection ....: MOPP

General remarks:

"(See Attachment #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.
The tests 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 testing laboratory.
List of test equipment must be kept on file and available for review.
Additional test data and/or information provided in the attachments to this report.

Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:2012

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..... :	☒ **Yes** ☐ **Not applicable**

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

Name and address of factory (ies)..... :	XP Power LLC, 990 Benecia Ave, Sunnyvale CA 94085, USA XP Power (Kunshan) Limited., 230, Bin Jiang Nan Road, Zhang Pu Town, Kunshan, Jiangsu 215300 China

General product information:

Report Summary: No additional testing was deemed necessary to make the following revisions under Amendment 1:

1. AddedOptional PWB Conformal Coating to Table 8.10
2. Added alternate PWB Layout, Rev. F1 to the Enclosures section.
3. Updated the Applicant and Manufacturing Address from Santa Ana, CA to Tustin, CA.

Product Description

Products covered are open frame power supplies intended for building-in to be used with Medical Electrical Equipment. Units are intended for used with Class I or Class II end-products.

Model Differences

All models in the Model ECS100USXX series are identical with exception to the Mains Transformer, T1, and minor secondary components that allow for different output voltage ratings. See below for Model Ratings for up to 50°C ambient with 10CFM fan only:

Model No.	Output Voltage (Vdc)	Max. Output Current (A)	Max. Output Power (W)
ECS100US12	10.1 to 13.5	8.3	100
ECS100US15	13.6 to 17	6.7	100
ECS100US18	17.1 to 21	5.5	100
ECS100US24	21.1 to 26	4.2	100
ECS100US28	26.1 to 31	3.6	100
ECS100US33	31.1 to 33	3.0	100
ECS100US36	33.1 to 42	2.8	100
ECS100US48	42.1 to 54	2.1	100

Suffix "SF" indicates single fuse provided in the line side of the primary.

See Enclosure 7-01 for de-rating table for ambient temperatures up to 70°C.

Additional Information

No additional testing was deemed necessary to evaluate the models covered under this Report to IEC 60601-1:2012, Edition 3 with Am.1 based on previously conducted testing and the review of product technical documentation including photos, schematics, wiring diagrams, etc. conducted under separate CB Scheme investigation to IEC 60601-1, 3rd ed issued under CBTR No. 11CA37885 and CBTC No. US-17807-UL.

The schematics are kept on file at the CBTL and can be provided by the manufacturer upon request by NCB's/CBTL's.

When submitting this Test Report to other Certification Body, the manufacturer is responsible for providing any additional information that the Body may need in order to issue its Mark, including testing for compliance with the applicable collateral standards.

Manufacturer to provide up to date IEC Licensed for component licenses greater than 3 years upon request. The need for the additional testing and evaluation shall be determined in the end product investigation.

Nameplate markings provided as part of Enclosure were considered representative of the entire series.

Technical Considerations

- The product was investigated to the following additional standards: ANSI/AAMI ES60601- 1:2005/C1:2009 +AM1(R2012) (includes National Differences for USA); CAN/CSA-C22.2 No. 60601-1:14 (includes National Differences for Canada), EN 60601-1:2006+A1 (2013), IEC 60601-1: 2012, 3rd Edition with AM. 1

- The product is evaluated only to the following hazards: Casualty, Fire, Shock

- The degree of protection against harmful ingress of water is: Ordinary

- Software is relied upon for meeting safety requirements related to mechanical, fire and shock: No

Risk Controls/ Engineering Condition of Acceptability

- The component shall be considered for compliance with the Marking (clause 7) and Separation (clause 8) requirements as part of the end use application evaluation.

- Repeat of leakage current testing and consideration of non-frequency weighted leakage current test (Clause 8.7.3e) shall be considered in the end product application.

- This power supply was evaluated with Two MOPP between Primary and Secondary; One MOPP primary and Earth/Secondary Reference Conductor; and One MOPP between Secondary and Earth/ Secondary Reference Conductor.

- This power supply has been evaluated as a continuous operation, ordinary equipment and has not been evaluated for use in the presence of a flammable anesthetic mixture with air, oxygen, or nitrous oxide. The output circuits have not been evaluated for direct patient connection (Type B, BF or CF).

- The end product shall ensure that the requirements related to accompanying documents, clause 7.9, are met.

- The available voltage for the secondary outputs does not exceed 25 Vac or 60 Vdc, under normal and single fault conditions.

- The following secondary output circuits are at non-hazardous energy levels: All outputs

- The output connectors are not acceptable for field connections; they are only intended for connection to mating connectors of the end-use equipment.

- The maximum investigated branch circuit rating is: 20 A

- The Electric Strength Test conducted on this power supply was based upon a maximum working voltage of: Primary-Earthed Dead Metal (Class I units): 353 Vpk, 244 Vrms; Primary-SEC: 547 Vpk, 240 Vrms.

- When installed in a Class I end product, the power supply shall be mounted in a manner that provides, at a minimum, 2.5 mm Clearance/4 mm Creepage between the primary sides of power supply and protectively earthed accessible conductive parts. In addition, when installed in a Class I end product, the protective bonding terminal of the power supply shall be reliably connected to the main protective earthing terminal of the end product.

- When installed in a Class II end product, the power supply shall be mounted, on insulating posts, in a manner that provides, at a min. 5 mm Clearance/8 mm Creepage between the power supply and any accessible conductive parts.

- An investigation of the protective bonding terminal has: Not been conducted.

- For Class I application: Protective bonding testing shall be considered in the end product application.

- Primary side heat sinks are floating and considered live. They should not be accessible in the end product.

- 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): L1-L3 and T1 (Class F, 155°C)

- Printed Wiring Board rated 130°C.

- Cleaning test shall be considered as part of end product evaluation.

- The need for Marking Durability and Marking Legibility Testing shall be considered as part of the end product installation.

- Fire/ Mechanical/ Electrical Enclosure to be provided as part of the end product.

- Unit provided with additional suffix "-SF" are provided with only one fuse in the line side. Consideration for the need for additional fusing to be provided as part of the end product

- The power supply was evaluated for use in 50°C ambient at Full Rated Output with 10CFM fan and 50% of the Rated Output in 70°C ambient. Additionally, the unit was evaluated for a max. output of 80W at 50°C and 40W at 70°C with convection cooling. (See Enclosure 7-01 for details).

Ref. Certif. No.

US-19126-A2-UL

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

SYSTEME CEI D'ACCEPTATION MUTUELLE DE CERTIFICATS D'ESSAIS DES EQUIPEMENTS ELECTRIQUES (IECEE) METHODE OC

CB TEST CERTIFICATE

CERTIFICAT D'ESSAI OC

Product Produit	Power supply for building-in, switch mode type
Name and address of the applicant Nom et adresse du demandeur	XP POWER L L C Suite 150 1241 E DYER RD Santa Ana, CA 92705 USA
Name and address of the manufacturer Nom et adresse du fabricant	XP POWER L L C Suite 150 1241 E DYER RD Santa Ana, CA 92705 USA
Name and address of the factory Nom et adresse de l'usine Note: *When more than one factory, please report on page 2* Note: *Lorsque il y plus d'une usine, veuillez utiliser la 2ème page*	XP POWER L L C 990 BENECIA AVE SUNNYVALE CA 94085 USA ☒ Additional Information on page 2
Ratings and principal characteristics Valeurs nominales et caractéristiques principales	See Page 2
Trademark (if any) Marque de fabrique (si elle existe)	XP
Type of Manufacturer's Testing Laboratories used Type de programme du laboratoire d'essais constructeur	SMT
Model / Type Ref. Ref. De type	ECS100USxx, ECS100US12-XB0302, ECS100US24-XB0303, ECS100US12-XB0533 See Page 2
Additional information (if necessary may also be reported on page 2) Les informations complémentaires (si nécessaire,, peuvent être indiqués sur la 2ème page	Additionally evaluated to EN 60950-1:2006 / A11:2009 / A1:2010 / A12:2011. National Differences specified in the CB Test Report. ☒ Additional Information on page 2
A sample of the product was tested and found to be in conformity with Un échantillon de ce produit a été essayé et a été considéré conforme à la	IEC 60950-1(ed.2), IEC 60950-1(ed.2);am1
As shown in the Test Report Ref. No. which forms part of this Certificate Comme indiqué dans le Rapport d'essais numéro de référence qui constitue partie de ce Certificat	E139109-A24-CB-2 issued on 2014-06-23

This CB Test Certificate is issued by the National Certification Body
Ce Certificat d'essai OC est établi par l'Organisme **National de Certification**

☒ UL (US), 333 Pfingsten Rd IL 60062, Northbrook, USA
☐ UL (Demko), Borupvang 5A DK-2750 Ballerup, DENMARK
☐ UL (JP), Marunouchi Trust Tower Main Building 6F, 1-8-3 Marunouchi, Chiyoda-ku, Tokyo 100-0005, JAPAN
☐ UL (CA), 7 Underwriters Road, Toronto, M1R 3B4 Ontario, CANADA

For full legal entity names see www.ul.com/ncbnames

Date: 2014-06-23
Original Issue Date: 2012-06-06

Signature:

Jolanta M. Wroblewska

Ref. Certif. No.

US-19126-A2-UL

Model Details:

ECS100USxx (where XX can be any number between 12 and 48 designating the output voltage), may also be provided with suffix "SF"

Factories:
XP POWER (KUNSHAN) LIMITED
230 BIN JIANG NAN ROAD
ZHANG PU TOWN
KUNSHAN, JIANGSU 215300
CHINA

Ratings:
Input:

ECS100USxx: 100-240 Vac, 1.9 A, 50/60 Hz
ECS100US12-XB0302: 100-240 Vac, 1.9 A, 50/60 Hz or 100-350Vdc
ECS100US24-XB0303: 100-240 Vac, 1.9 A, 50/60/400 Hz
ECS100US12-XB0533: 40-90 Vac, 1.9A, 50/60 Hz

Output: See Test Report for details.

Additional Information:
The original report was modified to include the following changes/additions:
Addition of model and ratings.
Added alternate capacitors, see test report.

Additional information (if necessary)
Information complémentaire (si nécessaire)

☒ UL (US), 333 Pfingsten Rd IL 60062, Northbrook, USA
☐ UL (Demko), Borupvang 5A DK-2750 Ballerup, DENMARK
☐ UL (JP), Marunouchi Trust Tower Main Building 6F, 1-8-3 Marunouchi, Chiyoda-ku, Tokyo 100-0005, JAPAN
☐ UL (CA), 7 Underwriters Road, Toronto, M1R 3B4 Ontario, CANADA

For full legal entity names see www.ul.com/ncbnames

Date: 2014-06-23
Original Issue Date: 2012-06-06

Signature:
Jolanta M. Wroblewska

Test Report issued under the responsibility of:

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

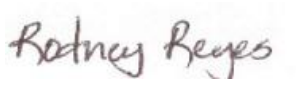
Report Reference No ..... :	E139109-A24-CB-2
Date of issue ..... :	2012-06-06
Total number of pages ..... :	22
CB Testing Laboratory ..... :	UL San Jose
Address ..... :	455 E. Trimble Rd., San Jose, CA, 95131-1230, USA
Applicant's name ..... :	XP POWER L L C
Address ..... :	SUITE 150 1241 E DYER RD SANTA ANA CA 92705 UNITED STATES
Test specification:	
Standard ..... :	IEC 60950-1:2005 (2nd Edition); Am 1:2009
Test procedure ..... :	CB Scheme
Non-standard test method ..... :	N/A
Test Report Form No. ..... :	IEC60950_1C
Test Report Form originator ..... :	SGS Fimko Ltd
Master TRF ..... :	2012-08

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 ..... :	Power supply for building-in, switch mode type
Trade Mark ..... :	
Manufacturer ..... :	XP POWER L L C SUITE 150 1241 E DYER RD SANTA ANA CA 92705 UNITED STATES
Model/Type reference ..... :	ECS100USxx (where xx can be any number between 12 and 48 designating the output voltage), may also be provided with suffix "SF"; ECS100US12-XB0302; ECS100US24-XB0303; ECS100US12-XB0533.
Ratings ..... :	Input: ECS100USxx: 100-240 Vac, 1.9 A, 50/60 Hz ECS100US12-XB0302: 100-240 Vac, 1.9 A, 50/60 Hz or 100-350Vdc ECS100US24-XB0303: 100-240 Vac, 1.9 A, 50/60/400 Hz ECS100US12-XB0533: 40-90 Vac, 1.9A, 50/60 Hz Output: See Model Differences for details.

Testing procedure and testing location:			
[ ]	**CB Testing Laboratory**		
	Testing location / address..... :		
[ ]	**Associated CB Test Laboratory**		
	Testing location / address..... :		
	Tested by (name + signature) ..... :		
	Approved by (name + signature) ... :		
[ ]	**Testing Procedure: TMP/CTF Stage 1**		
	Tested by (name + signature) ..... :		
	Approved by (+ signature) ..... :		
	Testing location / address..... :		
[ ]	**Testing Procedure: WMT/CTF Stage 2**		
	Tested by (name + signature) ..... :		
	Witnessed by (+ signature)..... :		
	Approved by (+ signature) ..... :		
	Testing location / address..... :		
[x]	**Testing Procedure: SMT/CTF Stage 3 or 4**		
	Tested by (name + signature) ..... :	Rodney Reyes	
	Approved by (+ signature) ..... :	Tac Pham	
	Supervised by (+ signature) ..... :	David E. Drewes	
	Testing location / address..... :	XP Power, LLC, 1241 E Dyer Rd, Suite 150, Santa Ana, CA, 92705 USA	
[ ]	**Testing Procedure: RMT**		
	Tested by (name + signature) ..... :		
	Approved by (+ signature) ..... :		
	Supervised by (+ signature) ..... :		
	Testing location / address..... :		

List of Attachments

National Differences (2 pages)

Enclosures (11 pages)

Summary Of Testing

Unless otherwise indicated, all tests were conducted at XP Power, LLC, 1241 E Dyer Rd, Suite 150, Santa Ana, CA, 92705 USA.

Tests performed (name of test and test clause)	Testing location / Comments
Input: Single-Phase (1.6.2)	
Durability of Marking (1.7.11)	Tested at UL LLC (ACBTL), 2929 E. Imperial Hwy. Suite 100, Brea CA 92821
Heating (4.5.1, 1.4.12, 1.4.13)	

Summary of Compliance with National Differences:

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

List of countries addressed: AT, BE, BG, BY, CA, CH, CZ, DE, DK, ES, EU, FI, FR, GB, GR, HU, IE, IL, IT, JP, KR, NL, PL, PT, RO, SE, SG, SI, SK, UA, US

The product fulfills the requirements of: CSA C22.2 No. 60950-1-07 + A1:2011, EN 60950-1:2006 + A1:2010 + A11:2009 + A12:2011, UL 60950-1 2nd Ed. Revised 2011-12-19, IEC 60950-1:2005 + A1:2009

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

Test item particulars :	
Equipment mobility .....:	for building-in
Connection to the mains .....:	for building-in
Operating condition .....:	continuous
Access location .....:	for building-in
Over voltage category (OVC) .....:	OVC II
Mains supply tolerance (%) or absolute mains supply values .....:	+6%, -10% for AC Models; +20%, -15% for Model ECS100US12-XB0302
Tested for IT power systems .....:	No
IT testing, phase-phase voltage (V) .....:	N/A
Class of equipment .....:	Class I or Class II (Determined by end product)
Considered current rating of protective device as part of the building installation (A) .....:	20
Pollution degree (PD) .....:	PD 2
IP protection class .....:	IPX0
Altitude of operation (m) .....:	3048
Altitude of test laboratory (m) .....:	less than 2000 meters
Mass of equipment (kg) .....:	0.17 kg
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 .....:	2014-05-28, 2014-06-18
Date(s) of Performance of tests .....:	2014-05-30 to 2014-06-04, 2014-06-18

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):

XP POWER L L C
990 BENECIA AVE
SUNNYVALE CA 94085
UNITED STATES

XP POWER (KUNSHAN) LIMITED
230, BIN JIANG NAN ROAD,
ZHANG PU TOWN
KUNSHAN,
JIANGSU 215300 CHINA

GENERAL PRODUCT INFORMATION:

Report Summary

The original report was modified on 2014-06-23 to include the following changes/additions:
-New model ECS100US12-XB0533.
-Revise output ratings in model differences to include output voltage ranges.
-Alternate capacitors C1, C8, C2, C3, C17, C22, C28, C29

Product Description

The model covered in this report is a component power supply intended for use in Information Technology Equipment. It is an open frame power supply intended for building-in Class I or Class II end-products. Double insulated symbol is optionally provided. Earthing symbol may only be provided for Class I power supplies.

Model Differences

All models in the Model ECS100USxx series are identical with exception to the Mains Transformer, T1, and minor secondary components that allow for different output voltage ratings. See below for Model Ratings Table Below:

Model ECS100US12: Output Rated: 10.1 Vdc to 13.5 Vdc, 8.3 A Max, 100 W Max
Model ECS100US15: Output Rated: 13.6 Vdc to 17 Vdc, 6.7 A Max, 100 W Max
Model ECS100US18: Output Rated: 17.1 Vdc to 21 Vdc, 5.5 A Max, 100 W Max
Model ECS100US24: Output Rated: 21.1 Vdc to 26 Vdc, 4.2 A Max, 100 W Max
Model ECS100US28: Output Rated: 26.1 Vdc to 31 Vdc, 3.6 A Max, 100 W Max
Model ECS100US33: Output Rated: 31.1 Vdc to 33 Vdc, 3.0 A Max, 100 W Max
Model ECS100US36: Output Rated: 33.1 Vdc to 42 Vdc, 3.6 A Max, 100 W Max
Model ECS100US48: Output Rated: 42.1 Vdc to 54 Vdc, 2.1 A Max, 100 W Max
Model ECS100US12-XB0302: Output Rated: 12 Vdc, 6.7 A
Model ECS100US24-XB0303: Output Rated: 24 Vdc, 4.2 A
Model ECS100US24-XB0533: Output Rated: 12 Vdc, 2.1 A Max, 25 W Max

Additional Suffix "SF" denotes units with only a single line side fuse.

See Enclosure - Miscellaneous for de-rated output values for higher ambient (AC models rated 100-240 Vac only).

Model ECS100US12-XB0302 is identical to Model ECS100US12 with the exception DC Mains connection, DC rated fuse and output ratings.

Model ECS100US24-XB0303 is identical to Model ECS100US24 with the exception of input rating addition of 400Hz.

Model ECS100US12-XB0533 is identical to Model ECS100US12 with exception to reduced input/output rating, input/output cables, and alternate heatsinks (base).

Additional Information

Based upon product similarity, previously conducted testing and the review of product construction, only limited tests were deemed necessary to add Model ECS100US24-XB0303 and Model ECS100US12-XB0533.

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 for 100% load at forced air cooling condition and 80% load at convection cooling condition; 70°C for 50%load at forced air cooling condition and 40% load at convection cooling condition. (See AC Model De-rating Curve, Enclosure 7-01 for details) Model ECS100US24-XB0533 evaluated at max ambient of 80°C at 100% load.,
- The means of connection to the mains supply is: for building-in, to be determined in the end product.
- The product is intended for use on the following power systems: TN; TN or DC mains supply for Model ECS100US12 -XB0302
- The product was investigated to the following additional standards: EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 (which includes all European national differences, including those specified in this test report).
- The following accessible locations (with circuit/schematic designation) are within a limited current circuit: Load side of C17 (Pri to Sec bridging capacitor). Load side of C29 (Pri to Sec bridging capacitor).
- Power supplies covered by this report were evaluated for both Class I and Class II (double insulated). Double insulated symbol is optionally provided. See Conditions of Acceptability for insulation required for Class II. Earthing symbol may only be provided for Class I power supplies. --
- Model ECS100US12-XB0533 was evaluated for use with a 50/60 Hz square wave form. --
- Per client specification, base of Model ECS100US12-XB0533 should not exceed 85°C. --

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
- The end-product Electric Strength Test is to be based upon a maximum working voltage of: Primary-SELV: 193 Vrms, 547 Vpk,
- The following secondary output circuits are SELV: All outputs
- The following secondary output circuits are at non-hazardous energy levels: All outputs
- The following output terminals were referenced to earth during performance testing: Secondary Output (J2) referenced using "Y1" capacitors.,
- The power supply terminals and/or connectors are: Suitable for factory wiring only
- The maximum investigated branch circuit rating is: 20 A for AC models
- The investigated Pollution Degree is: 2
- Proper bonding to the end-product main protective earthing termination is: required when the power supply is used in a Class I end product. The power supply will be considered Class II only when protection against electric shock does not rely on Basic Insulation and provides a minimum of 5 mm creepage and 4 mm clearance distance (mounted above chassis/accessible metal parts on

Insulating posts etc). Class II units have no reliance upon protective earthing.,

- An investigation of the protective bonding terminals has: Not been conducted
- The following input terminals/connectors must be connected to the end-product supply neutral: ACN J1
- 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): L1, L2 and T1 (Class F, 155°C) ,
- The following end-product enclosures are required: Mechanical, Fire, Electrical
- The maximum continuous power supply output (Watts) relied on forced air cooling from: External fan at 10 cfm applied to power supply input side with inward air-flow direction from 2.75 inch distance between fan and the unit.
- The equipment is suitable for direct connection to: AC mains supply; DC mains supply for Model ECS100US12 -XB0302,
- Printed Wiring Board rated 130°C. --
- The equipment is provided with a fuse in both the Line and Neutral of the primary circuit. The need for a marking warning service person of the hazards associated with neutral fusing shall be considered in the end-product. --
- Heatsinks are floating and considered live. They should not be accessible in the end-product. --
- Touch Current test to be conducted in the end-product evaluation. --
- Clearance spacing evaluated for 3048 m altitude. Additional consideration maybe necessary in the end-use 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)

Ref. Certif. No.

US-23760-UL

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

SYSTEME CEI D'ACCEPTATION MUTUELLE DE CERTIFICATS D'ESSAIS DES EQUIPEMENTS ELECTRIQUES (IECEE) METHODE OC

CB TEST CERTIFICATE

CERTIFICAT D'ESSAI OC

Product Produit	Component Switching Power Supply
Name and address of the applicant Nom et adresse du demandeur	XP POWER LLC SUITE 150, 1241 E DYER ROAD SANTA ANA, CA 92705, USA
Name and address of the manufacturer Nom et adresse du fabricant	XP POWER LLC SUITE 150, 1241 E DYER ROAD SANTA ANA, CA 92705, USA
Name and address of the factory Nom et adresse de l'usine Note: *When more than one factory, please report on page 2* Note: *Lorsque il y plus d'une usine, veuillez utiliser la 2ème page*	XP POWER LLC 990 BENECIA AVE SUNNYVALE CA 94085 USA ☒ Additional Information on page 2
Ratings and principal characteristics Valeurs nominales et caractéristiques principales	See Page 2
Trademark (if any) Marque de fabrique (si elle existe)	
Type of Manufacturer's Testing Laboratories used Type de programme du laboratoire d'essais constructeur	SMT
Model / Type Ref. Ref. De type	ECS100USxx-By, ECS100US12-B-XE0399 See Page 2
Additional information (if necessary may also be reported on page 2) Les informations complémentaires (si nécessaire,, peuvent être indiqués sur la 2ème page	Additionally evaluated to EN 60601-1:2006/A1:2013; National Differences specified in the CB Test Report. ☐ Additional Information on page 2
A sample of the product was tested and found to be in conformity with Un échantillon de ce produit a été essayé et a été considéré conforme à la	IEC 60601-1(ed.3), IEC 60601-1(ed.3);am1
As shown in the Test Report Ref. No. which forms part of this Certificate Comme indiqué dans le Rapport d'essais numéro de référence qui constitue partie de ce Certificat	4786488108-2 issued on 2014-08-06

This CB Test Certificate is issued by the National Certification Body

Ce Certificat d'essai OC est établi par l'Organisme **National de Certification**

☒ UL (US), 333 Pfingsten Rd IL 60062, Northbrook, USA
☐ UL (Demko), Borupvang 5A DK-2750 Ballerup, DENMARK
☐ UL (JP), Marunouchi Trust Tower Main Building 6F, 1-8-3 Marunouchi, Chiyoda-ku, Tokyo 100-0005, JAPAN
☐ UL (CA), 7 Underwriters Road, Toronto, M1R 3B4 Ontario, CANADA

For full legal entity names see www.ul.com/ncbnames

Date: 2014-08-14

Signature:

Jolanta M. Wroblewska

Ref. Certif. No.

US-23760-UL

Model Details:

ECS100USxx-By (where xx can be any number between 12 and 48 designating the output voltage, y can be blank or SF).
Models with suffix SF designate single fuse.

ECS100US12-B-XE0399

Factories:

XP POWER (KUNSHAN) LTD
230 BIN JIANG NAN RD ZHANGPU TOWN KUNSHAN JIANGSU 215321
CHINA

Ratings:

Models ECS100USxx-By:
Input Rated: 100-240 V~, 1.9A, 50/60 Hz
Output Rated: See Enclosure - Miscellaneous 7-01 for maximum output details.

Model ECS100US12-B-XE0399:
Input Rated: 100-240 V~, 1.9A, 50-60 Hz
Output Rated: 12Vdc, 8.34A

Additional information (if necessary)
Information complémentaire (si nécessaire)

☒ UL (US), 333 Pfingsten Rd IL 60062, Northbrook, USA
☐ UL (Demko), Borupvang 5A DK-2750 Ballerup, DENMARK
☐ UL (JP), Marunouchi Trust Tower Main Building 6F, 1-8-3 Marunouchi, Chiyoda-ku, Tokyo 100-0005, JAPAN
☐ UL (CA), 7 Underwriters Road, Toronto, M1R 3B4 Ontario, CANADA

For full legal entity names see www.ul.com/ncbnames

Date: 2014-08-14

Signature:

Jolanta M. Wroblewska

Test Report issued under the responsibility of:

IEC 60601-1
Medical electrical equipment
Part 1: General requirements for basic safety and essential performance

Report Reference No.....:	**4786488108-2**
Date of issue .....:	**2014-08-06**
Total number of pages.....:	**156**
CB Testing Laboratory.....:	**UL Camas**
Address .....:	**2600 NW Lake Road Camas, WA 98607 USA**
Applicant's name.....:	**XP Power LLC**
Address .....:	**Suite 150, 1241 E Dyer Road Santa Ana, CA 92705 USA**
Test specification:	
Standard .....:	**IEC 60601-1: 2005 + CORR. 1:2006 + CORR. 2:2007 + AM1:2012 (or IEC 60601-1: 2012 reprint)**
Test procedure.....:	**CB Scheme**
Non-standard test method……..:	
Test Report Form No.....:	**IEC60601_1I**
Test Report Form Originator .....:	**UL (US)**
Master TRF.....:	**2014-03**

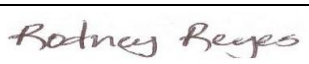
This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.

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 .....:	Component Switching Power Supply
Trade Mark .....:	
Manufacturer.....:	XP Power LLC Suite 150, 1241 E Dyer Road, Santa Ana, CA 92705 USA
Model/Type reference.....:	ECS100USxx-By (where xx can be any number between 12 and 48 designating the output voltage, y can be blank or SF). Models with suffix SF designate single fuse. ECS100US12-B-XE0399
Ratings.....:	Models ECS100USxx-By: Input Rated: 100-240 V~, 1.9A, 50/60 Hz Output Rated: See Enclosure - Miscellaneous 7-01 for maximum output details. Model ECS100US12-B-XE0399: Input Rated: 100-240 V~, 1.9A, 50-60 Hz Output Rated: 12Vdc, 8.34A

Testing procedure and testing location:			
☐	**CB Testing Laboratory:**		
Testing location/ address			
☐	**Associated CB Testing Laboratory:**		
Testing location/ address			
Tested by (name + signature).....			
Approved by (name + signature)			
☐	**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		XP Power LLC Suite 150, 1241 E Dyer Road, Santa Ana, CA 92705 USA	
Tested by (name + signature).....		Rodney Reyes	
Witnessed by (name + signature)			
Approved by (name + signature)		Tac Pham	
Supervised by (name + signature).....		Bernadette Matsuoka	

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

National Differences (9 pages)

Enclosures (121 pages)

Summary of testing: Unless otherwise indicated, all tests were conducted at XP POWER LLC, SUITE 150, 1241 E DYER RD, SANTA ANA CA 92705, USA.

All testing conducted under the Applicant's IEC 60601-1, 3rd Ed investigation issued under CBTR No. E146893-A32-CB-1, CBTC No. US-18290-UL was consider to cover the requirements of IEC 60601-1, Edition 3 with Am 1.

Tests performed (name of test and test clause):	**Testing location:**
Power Input Test (4.11) Humidity Preconditioning Treatment (5.7) Voltage or Charge Limitation (8.4.3) Working Voltage Measurement (8.4.2) Dielectric Voltage Withstand (8.8.3) Ball Pressure (8.8.4.1) Temperature Test (11) Abnormal Operation and Single Fault Conditions (13.2) Transformer Overload and Short-Circuit Tests (15.5.1) Leakage Current Test (8.7)	XP Power LLC Suite 150 1241 E Dyer Road Santa Ana, CA 92705 USA

Summary of compliance with National Differences

List of countries addressed: Austria, Canada, Republic of Korea, Sweden, UK, USA

☒ The product fulfils the requirements of IEC 60601-1, Edition 3.1

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.

See Enclosures 13-01 and 13-02. The word "BETA" is not intended to be included as part of the model name.

GENERAL INFORMATION

Test item particulars (see also Clause 6):

Classification of installation and use ..... :	For building-in
Device type (component/sub-assembly/ equipment/ system) :	Component
Intended use (Including type of patient, application location) :	Provide regulated power to medical devices
Mode of operation .....:	Continuous
Supply connection	For building-in
Accessories and detachable parts included.....:	None
Other options include .....:	None

Testing

Date of receipt of test item(s) .....:	2011-03-07, 2013-01-17
Dates tests performed.....:	2011-04-07 to 2011-12-03, 2013-01-18 to 2013-01-21

Possible test case verdicts:

- test case does not apply to the test object .....:	N/A
- test object does meet the requirement.....:	Pass (P)
- test object was not evaluated for the requirement ..... :	N/E (collateral standards only)
- test object does not meet the requirement.....:	Fail (F)

Abbreviations used in the report:

- normal condition.....: N.C.	- single fault condition.....: S.F.C.
- means of Operator protection .....: MOOP	- means of Patient protection ....: MOPP

General remarks:

"(See Attachment #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.
The tests 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 testing laboratory.
List of test equipment must be kept on file and available for review.
Additional test data and/or information provided in the attachments to this report.

Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:2012

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..... :

☒ **Yes**

☐ **Not applicable**

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

Name and address of factory (ies)..... :	XP POWER LLC 990 BENECIA AVE SUNNYVALE CA 94085 UNITED STATES XP POWER (KUNSHAN) LTD 230 BIN JIANG NAN RD ZHANGPU TOWN KUNSHAN JIANGSU 215321 CHINA

General product information:

Model covered in this report is a component power supply intended for use in Medical Electrical Equipment. It is an open frame power supply intended for building-in Class I or Class II end -product. The need for the additional testing and evaluation shall be determined in the end product evaluation.

Model Differences:

All models in the Model ECS100USxx-By series are identical with exception to the Mains Transformer (T1) and minor secondary components that allow for different output voltage ratings. Models with suffix SF designate single fuse in line side.

Model ECS100US12-B-XE0399 is similar to Model ECS100US12-B series except for a larger PWB and addition of Metal Oxide Varistor (VDR2), Ceramic Capacitors (C20, C21), and Secondary Capacitor (C11).

Additional Information:

Marking Plate 13-01 is considered representative of all models covered under this Report, except for Model ECS100US12-B-XE03999 which is specifically represented by Marking Plate 13-02.

Power Supply CB Certificate is attached. Complete report to be provided upon request.

CB Test certificates for components are included in Licenses Enclosure. In accordance with the current rules of CB Scheme, CB Test certificate is effective for 3 years. Recognizing NCB may challenge the CBTC when certificates are more than 3 years old.

When submitting this Test Report to other Certification Body, the manufacturer is responsible for providing any additional information that the Body may need in order to issue its Mark, including testing for compliance with the applicable collateral standards.

The clearance distances have additionally been assessed for suitability up to 3000 m elevation.

All tests were conducted with optional Y-Capacitors (C2, C3, C22) installed as considered worst case.

No additional testing was deemed necessary to evaluate the models covered under this Report to IEC 60601-1, Edition 3 with Am.1 based on previously conducted testing and the review of product technical documentation including photos, schematics, wiring diagrams, etc. conducted under separate CB Scheme investigation to IEC 60601-1, 3rd ed issued under CBTR No. E146893-A32-CB-1 and CBTC No. US-18290-UL.

Technical Considerations:

- The product was investigated to the following additional standards:: ANSI/AAMI ES60601-1 (2005 + C1:09 + A2:10)+AM1 (Medical Electrical Equipment - Part 1: General Requirements for Basic Safety and Essential Performance) (includes Deviations for United States), CAN/CSA-C22.2 No. 60601-1 (2008) +AM1 (2014) (Medical Electrical Equipment - Part 1: General Requirements for Basic Safety and Essential Performance) (includes National Differences for Canada), EN 60601-1 +AM1 (2013) (Medical electrical equipment Part 1: General requirements for basic safety and essential performance), IEC 60601-1, Edition 3 with Am. 1.
- The product was not investigated to the following standards or clauses:: Biocompatibility (ISO 10993-1), Clause 14, Programmable Electronic Systems, Electromagnetic Compatibility (IEC 60601-1-2)
- The degree of protection against harmful ingress of water is: Ordinary
- The mode of operation is: Continuous
- The product is suitable for use in the presence of a flammable anesthetics mixture with air or oxygen or with nitrous oxide:: No

- Scope of Power Supply evaluation defers the following clauses to the be determined as part of the end product: Clause 7.5 (Safety Signs), Clause 7.9 (Accompanying Documents), Clause 9 (ME Hazard), Clause 10 (Radiation), Clause 14 (PEMS), Clause 16 (ME Systems)
- The product is Classified only to the following hazards: Shock, Fire, Casualty
- The following accessories were investigated for use with the product: None
- Power Supply was considered Overvoltage Category II (OVCII)

Engineering Conditions of Acceptability

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

- The component shall be considered for compliance with the Marking (clause 7) and Separation (clause 8) requirements as part of the end use application evaluation.
- Consideration should be given to measuring the temperature on power electronic components and transformer windings when the power supply is installed in the end-use equipment. The end use product shall ensure that the power supply is used within its ratings.
- Proper bonding to the end-product main protective earthing termination is required. Grounding continuity shall be conducted in the end product.
- Repeat of leakage current testing and consideration of non-frequency weighted leakage current (clause 8.7.3) to be considered as part of the end product.
- This power supply has been evaluated as a continuous operation, ordinary equipment and has not been evaluated for use in the presence of a flammable anesthetic mixture with air, oxygen, or nitrous oxide. The output circuits have not been evaluated for direct patient connection (Type B, BF or CF).
- The end product shall ensure that the requirements related to accompanying documents, clause 7.9, are met.
- The available voltage for the secondary outputs does not exceed 25 Vac or 60 Vdc, under normal and single fault conditions.
- The following secondary output circuits are at hazardous energy levels: Output
- The input/output connectors are not acceptable for field connections; they are only intended for connection to mating connectors of the end-use equipment.
- The end-product Electric Strength Test is to be based upon a maximum working voltage of Primary-SELV: 240 Vrms, 541Vpk; Primary to Ground: 244Vrms, 353Vpk.
- Cleaning test shall be considered as part of end product evaluation.
- The need for Marking Durability and Marking Legibility Testing shall be considered as part of the end product installation.
- Fire/ Mechanical/ Electrical Enclosure to be provided as part of the end product.
- Fuse replacement marking to be provided near the fuse holder as part of the end product.
- Magnetic devices T1, L1, L2 employ a Class F (155°C) insulation system.
- PWB is rated 130 deg. C.
- Temperature, Leakage Current, Protective Earthing, Dielectric Voltage Withstand, and Interruption of the Power Supply tests should be considered as part of the end product evaluation.
- The products were tested on a 20 A branch circuit. If used on a branch circuit greater than this, additional testing may be necessary.
- This power supply was evaluated with Two MOPP between primary and secondary; One MOPP primary and Earth; One MOPP between secondary and Earth for Class I application; Functional Insulation between secondary and floated earth trace for class II application

- Compliance of adequate breaking capacity of the fuse per Clause 8.11.5 to be verified when installed in an end product.
- The need for Marking Durability and Marking Legibility Testing to be considered as part of the end product installation
- A single input current rating is provided over the entire 100-240Vac voltage range. The end product evaluation is to determine the acceptability.
- When installed in a Class I end product, the power supply shall be mounted in a manner that provides, at a min. 2.5 mm Clearance between the primary side of the power supply and protectively earthed accessible conductive parts. In addition, when installed in a Class I end product, the protective bonding terminal of the power supply shall be reliably connected to the main protective earthing terminal of the end product.
- When installed in a Class II end product, the power supply shall be mounted, on insulating posts, in a manner that provides, at a min. 5.1 mm Clearance between the primary side of the power supply and any accessible conductive parts.
- Fire/ Mechanical/ Electrical Enclosure to be provided as part of the end product.
- Units with SF suffix are provided with only one fuse in the line side. The need for additional fusing shall be determined as part of the end-product evaluation.
- The equipment has been evaluated for use in a maximum ambient of 50°C for 100% load at forced air cooling condition and 80% load at convection cooling condition; evaluated for use in a maximum ambient of 70°C for 50% load at forced air cooling condition and 40% load at convection cooling condition. 10CFM used for forced air cooling evaluation. (See De-rating Curve, Miscellaneous Enclosure 7-05).

Ref. Certif. No.

US-17862-A3-UL

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

SYSTEME CEI D'ACCEPTATION MUTUELLE DE CERTIFICATS D'ESSAIS DES EQUIPEMENTS ELECTRIQUES (IECEE) METHODE OC

CB TEST CERTIFICATE

CERTIFICAT D'ESSAI OC

Product Produit	Power supply for building-in, switch mode type
Name and address of the applicant Nom et adresse du demandeur	XP POWER LLC SUITE 150 1241 E DYER RD SANTA ANA CA 92705 UNITED STATES
Name and address of the manufacturer Nom et adresse du fabricant	XP POWER LLC SUITE 150 1241 E DYER RD SANTA ANA CA 92705 UNITED STATES
Name and address of the factory Nom et adresse de l'usine Note: *When more than one factory, please report on page 2* Note: *Lorsque il y plus d'une usine, veuillez utiliser la 2ème page*	XP POWER LLC 990 BENECIA AVE SUNNYVALE CA 94085 UNITED STATES ☒ Additional Information on page 2
Ratings and principal characteristics Valeurs nominales et caractéristiques principales	Input: 100-240 Vac, 1.9 A, 50/60 Hz Output: See Enclosure - Miscellaneous Models output rating and differences in test report for details.
Trademark (if any) Marque de fabrique (si elle existe)	XP
Type of Manufacturer's Testing Laboratories used Type de programme du laboratoire d'essais constructeur	
Model / Type Ref. Ref. De type	ECS100USxx-By See Page 2
Additional information (if necessary may also be reported on page 2) Les informations complémentaires (si nécessaire,, peuvent être indiqués sur la 2ème page	☒ Additional Information on page 2
A sample of the product was tested and found to be in conformity with Un échantillon de ce produit a été essayé et a été considéré conforme à la	IEC 60950-1(ed.2), IEC 60950-1(ed.2);am1
As shown in the Test Report Ref. No. which forms part of this Certificate Comme indiqué dans le Rapport d'essais numéro de référence qui constitue partie de ce Certificat	E139109-A89-CB-1 issued on 2014-05-16

This CB Test Certificate is issued by the National Certification Body
Ce Certificat d'essai OC est établi par l'Organisme **National de Certification**

☒ UL (US), 333 Pfingsten Rd IL 60062, Northbrook, USA
☐ UL (Demko), Borupvang 5A DK-2750 Ballerup, DENMARK
☐ UL (JP), Marunouchi Trust Tower Main Building 6F, 1-8-3 Marunouchi, Chiyoda-ku, Tokyo 100-0005, JAPAN
☐ UL (CA), 7 Underwriters Road, Toronto, M1R 3B4 Ontario, CANADA

For full legal entity names see www.ul.com/ncbnames

Date: 2014-05-16
Original Issue Date: 2011-10-17

Signature:

Jolanta M. Wroblewska

Ref. Certif. No.

US-17862-A3-UL

Model Details:
ECS100USxx-By (where xx can be any number between 12 and 48 designating the output voltage, y can be blank, SF or C). Models with SF designate single fuse option and models with suffix C are provided with a cover for Class I use only.

Factories:
XP POWER (KUNSHAN) LIMITED
230, BIN JIANG NAN ROAD, ZHANG PU TOWN KUNSHAN, JIANGSU 215300
CHINA

Additional Information:
Additionally evaluated to EN 60950-1:2006 /A11:2009 /A1:2010 /A12:2011. National Differences specified in the CB Test Report.

The original report was modified to include the following changes/additions:
Updated components and National Differences.

Additional information (if necessary)
Information complémentaire (si nécessaire)

☒ UL (US), 333 Pfingsten Rd IL 60062, Northbrook, USA
☐ UL (Demko), Borupvang 5A DK-2750 Ballerup, DENMARK
☐ UL (JP), Marunouchi Trust Tower Main Building 6F, 1-8-3 Marunouchi, Chiyoda-ku, Tokyo 100-0005, JAPAN
☐ UL (CA), 7 Underwriters Road, Toronto, M1R 3B4 Ontario, CANADA

For full legal entity names see www.ul.com/ncbnames

Date: 2014-05-16
Original Issue Date: 2011-10-17

Signature:

Jolanta M. Wroblewska

Test Report issued under the responsibility of:

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

Report Reference No ..... :	E139109-A89-CB-1
Date of issue ..... :	2011-10-17
Total number of pages ..... :	10
CB Testing Laboratory ..... :	UL San Jose
Address ..... :	455 E. Trimble Rd., San Jose, CA, 95131-1230, USA
Applicant's name ..... :	XP POWER LLC
Address ..... :	SUITE 150 1241 E DYER RD SANTA ANA CA 92705 UNITED STATES
Test specification:	
Standard ..... :	IEC 60950-1:2005 (2nd Edition); Am 1:2009
Test procedure ..... :	CB Scheme
Non-standard test method ..... :	N/A
Test Report Form No. ..... :	IEC60950_1C
Test Report Form originator ..... :	SGS Fimko Ltd
Master TRF ..... :	2012-08

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 ..... :	Power supply for building-in, switch mode type
Trade Mark ..... :	
Manufacturer ..... :	XP POWER LLC SUITE 150 1241 E DYER RD SANTA ANA CA 92705 UNITED STATES
Model/Type reference ..... :	ECS100USxx-By (where xx can be any number between 12 and 48 designating the output voltage, y can be blank, SF or C). Models with SF designate single fuse option and models with suffix C are provided with a cover for Class I use only.
Ratings ..... :	Input: 100-240 Vac, 1.9 A, 50/60 Hz Output: See Enclosure - Miscellaneous Models output rating and differences for details.

Testing procedure and testing location:			
[ ]	**CB Testing Laboratory**		
	Testing location / address..... :		
[x]	**Associated CB Test Laboratory**		
	Testing location / address..... :	UL Brea 2929 Imperial Hwy, Ste 100, Brea, CA, 92821, USA	
	Tested by (name + signature) ..... :	Nathan Escalante	
	Approved by (name + signature) ... :	David Drewes	
[ ]	**Testing Procedure: TMP/CTF Stage 1**		
	Tested by (name + signature) ..... :		
	Approved by (+ signature) ..... :		
	Testing location / address..... :		
[ ]	**Testing Procedure: WMT/CTF Stage 2**		
	Tested by (name + signature) ..... :		
	Witnessed by (+ signature)..... :		
	Approved by (+ signature) ..... :		
	Testing location / address..... :		
[ ]	**Testing Procedure: SMT/CTF Stage 3 or 4**		
	Tested by (name + signature) ..... :		
	Approved by (+ signature) ..... :		
	Supervised by (+ signature) ..... :		
	Testing location / address..... :		
[ ]	**Testing Procedure: RMT**		
	Tested by (name + signature) ..... :		
	Approved by (+ signature) ..... :		
	Supervised by (+ signature) ..... :		
	Testing location / address..... :		

List of Attachments

National Differences (4 pages)

Enclosures (7 pages)

Summary of Testing:

No tests were conducted

Summary of Compliance with National Differences:

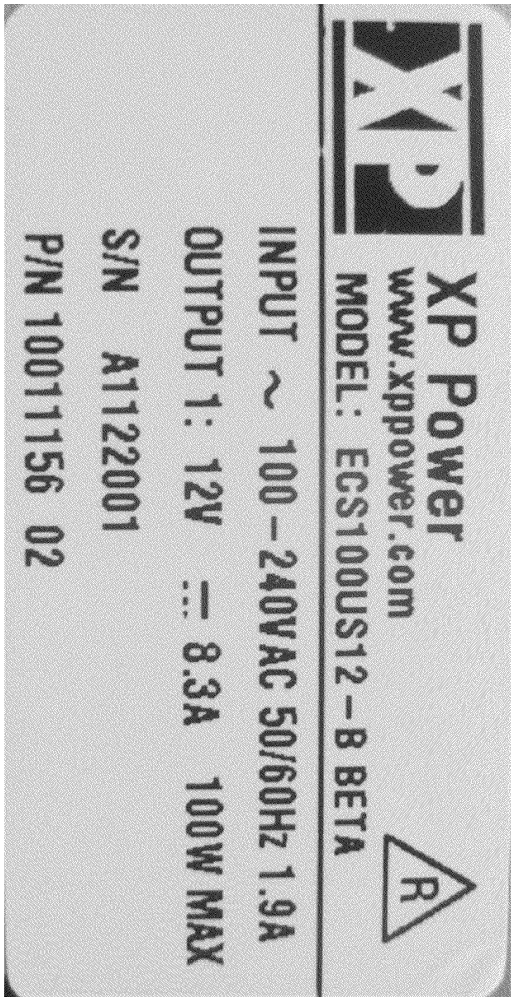
Countries outside the CB Scheme membership may also accept this report.

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

The product fulfills the requirements of: CSA C22.2 No. 60950-1-07 + A1:2011, EN 60950-1:2006 + A1:2010 + A11:2009 + A12:2011, IEC 60950-1:2005 + A1:2009, UL 60950-1 2nd Ed. Revised 2011-12-19

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 ..... :	for building-in
Operating condition ..... :	continuous
Access location ..... :	operator accessible
Over voltage category (OVC) ..... :	OVC II
Mains supply tolerance (%) or absolute mains supply values ..... :	+6%, -10%
Tested for IT power systems ..... :	Yes
IT testing, phase-phase voltage (V) ..... :	230
Class of equipment ..... :	Class I or Class II (Determined by end product)
Considered current rating of protective device as part of the building installation (A) ..... :	20
Pollution degree (PD) ..... :	PD 2
IP protection class ..... :	IPX0
Altitude of operation (m) ..... :	Up to 3048
Altitude of test laboratory (m) ..... :	180
Mass of equipment (kg) ..... :	341 gram approx.
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 ..... :	N/A
Date(s) of Performance of tests ..... :	N/A
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:	Yes
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 ..... When differences exist, they shall be identified in the General Product Information section.	
Name and address of Factory(ies):	XP POWER LLC 990 BENECIA AVE SUNNYVALE CA 94085 UNITED STATES

XP POWER (KUNSHAN) LIMITED
230, BIN JIANG NAN ROAD,
ZHANG PU TOWN
KUNSHAN,
JIANGSU 215300 CHINA

GENERAL PRODUCT INFORMATION:

Report Summary

The original report was modified on 2014-05-16 to include the following changes/additions:
Updated PWB layout enclosure (5-01) with minor modification to accommodate non-safety related components R1 and R2.

Added Israel National Differences

Product Description

The model covered in this report is a component power supply intended for use in Information Technology Equipment. It is an open frame power supply with or without metal chassis intended for building-in Class I or Class II end-products.

Model Differences

All models in the Model ECS100USxx-By series are identical with exception to the Mains Transformer, T1, and minor secondary components that allow for different output voltage ratings. Models with suffix C is provided with chassis for Class I use only.

Additional Information

The need for the additional testing and evaluation shall be determined in the end product investigation.

The nameplate markings provided as an Enclosure - Marking Plate are considered representative of the entire series.

Required values for clearance are adjusted for 3048 m (1.15 correction factor as per IEC 60664-1, Table A2).

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 for 100% load at forced air cooling condition and 80% load at convection cooling condition; 70°C for 50% load at forced air cooling condition and 40% load at convection cooling condition.
- The means of connection to the mains supply is: to be determined in end product.
- The product is intended for use on the following power systems: TN, IT
- The product was investigated to the following additional standards: EN 60950-1:2006 + A11:2009 + A1:2010 + A12:2011 (which includes all European national differences, including those specified in this test report).
- The following accessible locations (with circuit/schematic designation) are within a limited current

circuit: Load side of C29 (Pri to Sec bridging capacitor),

- Power supplies covered by this report were evaluated for both Class I and Class II (double insulated). Models with suffix C are provided with enclosure cover and are for Class I use only. See Conditions of Acceptability. --
- The unit has two cooling condition: 1) External Forced Air Cooling: 10CFM air flow, 2.75 inch distand from Fan to input side of the unit with inward air-flow direction; 2) Convection cooling in metal enclosure. --

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
- The end-product Electric Strength Test is to be based upon a maximum working voltage of: Primary-SELV: 240 Vrms, 547 Vpk,
- The following secondary output circuits are SELV: All outputs
- The following secondary output circuits are at non-hazardous energy levels: All outputs
- The following output terminals were referenced to earth during performance testing: Secondary Output (J2) referenced using "Y1" capacitors.,
- The power supply terminals and/or connectors are: Suitable for factory wiring only,
- 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 when the power supply is used in a Class I end product. Models with suffix C are provided with enclosure cover and are for Class I use only. The power supply will be considered Class II only when protection against electric shock does not rely on Basic Insulation and provided with sufficient spacings between primary part of power supply to secondary or accessible parts on the end product. Class II units have no reliance upon protective earthing.,
- An investigation of the protective bonding terminals has: Not been conducted. The protective bonding terminal has not been investigated for functional grounding. The acceptability of the protective bonding means shall be determined in the end product.,
- The following input terminals/connectors must be connected to the end-product supply neutral: ACN J1
- 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): L1, L2 (155°C) and T1 (Class F) ,
- The following end-product enclosures are required: Mechanical, Fire,
- The maximum continuous power supply output (Watts) relied on forced air cooling from: External fan at 10 cfm applied to power supply input side with inward air-flow direction from 2.75 inch distance between fan and the unit.,
- The equipment is suitable for direct connection to: AC mains supply
- Printed Wiring Board rated 130°C. --
- The equipment is provided with a fuse in both the Line and Neutral of the primary circuit. --
- Heatsinks are floating and considered live. They should not be accessible in the end-product. --
- Touch Current test to be conducted in the end-product evaluation based upon end product construction. --
- Clearance spacing evaluated for 3048 m altitude. Additional consideration maybe necessary in the

end-use product. --

- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's: 50°C for 100% load at forced air cooling condition and 80% load at convection cooling condition; 70°C for 50% load at forced air cooling condition and 40% load at convection cooling condition. Other than above loading condition on Tma shall be done in the end production application. --

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)

Ref. Certif. No.

US-24049-A1-UL

IEC SYSTEM FOR MUTUAL RECOGNITION OF TEST CERTIFICATES FOR ELECTRICAL EQUIPMENT (IECEE) CB SCHEME

SYSTEME CEI D'ACCEPTATION MUTUELLE DE CERTIFICATS D'ESSAIS DES EQUIPEMENTS ELECTRIQUES (IECEE) METHODE OC

CB TEST CERTIFICATE

CERTIFICAT D'ESSAI OC

Product Produit	Component Switching Power Supply
Name and address of the applicant Nom et adresse du demandeur	XP Power LLC 15641 RED HILL AVE., STE 100, TUSTIN, CA 92780 USA
Name and address of the manufacturer Nom et adresse du fabricant	XP Power LLC 15641 RED HILL AVE., STE 100, TUSTIN, CA 92780 USA
Name and address of the factory Nom et adresse de l'usine Note: *When more than one factory, please report on page 2* Note: *Lorsque il y plus d'une usine, veuillez utiliser la 2ème page*	XP POWER LLC 990 BENECIA AVE, SUNNYVALE CA 94085 USA ☒ Additional Information on page 2
Ratings and principal characteristics Valeurs nominales et caractéristiques principales	Input Rated: 100-240 V~,50/60 Hz, 3A Output Rated: See test report for details.
Trademark (if any) Marque de fabrique (si elle existe)	XP
Type of Manufacturer's Testing Laboratories used Type de programme du laboratoire d'essais constructeur	
Model / Type Ref. Ref. De type	ECS130US15-XA1013, ECS130USxx-yy See Page 2
Additional information (if necessary may also be reported on page 2) Les informations complémentaires (si nécessaire,, peuvent être indiqués sur la 2ème page	☒ Additional Information on page 2
A sample of the product was tested and found to be in conformity with Un échantillon de ce produit a été essayé et a été considéré conforme à la	IEC 60601-1(ed.3), IEC 60601-1(ed.3);am1
As shown in the Test Report Ref. No. which forms part of this Certificate Comme indiqué dans le Rapport d'essais numéro de référence qui constitue partie de ce Certificat	4786488107-20140915 issued on 2014-12-22

This CB Test Certificate is issued by the National Certification Body
Ce Certificat d'essai OC est établi par l'Organisme **National de Certification**

☒ UL (US), 333 Pfingsten Rd IL 60062, Northbrook, USA
☐ UL (Demko), Borupvang 5A DK-2750 Ballerup, DENMARK
☐ UL (JP), Marunouchi Trust Tower Main Building 6F, 1-8-3 Marunouchi, Chiyoda-ku, Tokyo 100-0005, JAPAN
☐ UL (CA), 7 Underwriters Road, Toronto, M1R 3B4 Ontario, CANADA

For full legal entity names see www.ul.com/ncbnames

Date: 2015-01-13
Original Issue Date: 2014-10-09

Signature:

Jolanta M. Wroblewska

Ref. Certif. No.

US-24049-A1-UL

Model Details:

ECS130USxx-yy (where xx can be any number between 12 and 48 designating the output voltage, yy can be blank, C, or SF). Models with suffix SF designate single fuse.

ECS130US15-XA1013

Factories:
XP POWER (KUNSHAN) LIMITED.
230, BIN JIANG NAN ROAD, ZHANG PU TOWN, KUNSHAN, JIANGSU 215300
CHINA

Additional Information:
Additionally evaluated to EN 60601-1:2006 / A1:2013; National Differences specified in the CB Test Report.

The original report was modified to include the following changes/additions:
1. Decrease the values of Bleeder Resistors (R1, R2) from 1Mohms to 750kohms.
2. Add Optional PWB Conformal Coating to Table.
3. Update the Applicant and Manufacturing address.

Additional information (if necessary)
Information complémentaire (si nécessaire)

☒ UL (US), 333 Pfingsten Rd IL 60062, Northbrook, USA
☐ UL (Demko), Borupvang 5A DK-2750 Ballerup, DENMARK
☐ UL (JP), Marunouchi Trust Tower Main Building 6F, 1-8-3 Marunouchi, Chiyoda-ku, Tokyo 100-0005, JAPAN
☐ UL (CA), 7 Underwriters Road, Toronto, M1R 3B4 Ontario, CANADA

For full legal entity names see www.ul.com/ncbnames

Date: 2015-01-13
Original Issue Date: 2014-10-09

Signature:
Jolanta M. Wroblewska

Test Report issued under the responsibility of:

IEC 60601-1
Medical electrical equipment
Part 1: General requirements for basic safety and essential performance

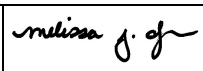
Report Reference No.....:	4786488107-20140915
Date of issue .....:	2014-09-15
	Amendment 1: 2014-12-22
Total number of pages.....:	22
CB Testing Laboratory.....:	UL Camas
Address .....:	2600 NW Lake Rd., Camas, WA 98607, USA
Applicant's name.....:	XP Power LLC
Address .....:	15641 RED HILL AVE., STE 100, TUSTIN, CA 92780 USA
Test specification:	
Standard .....:	IEC 60601-1: 2005 + CORR. 1:2006 + CORR. 2:2007 + AM1:2012 (or IEC 60601-1: 2012 reprint)
Test procedure.....:	CB Scheme
Non-standard test method……..:	N/A
Test Report Form No.....:	IEC60601_1J
Test Report Form Originator.....:	UL(US)
Master TRF.....:	2014-07

If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed.

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 .....:	Component Switching Power Supply	
Trade Mark .....:		
Manufacturer.....:	XP Power LLC, 15641 RED HILL AVE., STE 100, TUSTIN, CA 92780 USA	
Model/Type reference.....:	ECS130USxx-yy (where xx can be any number between 12 and 48 designating the output voltage, yy can be blank, C, or SF). Models with suffix SF designate single fuse ECS130US15-XA1013	
Ratings.....:	Input Rated: 100-240 V~,50/60 Hz, 3A Output Rated: See Enclosure - Miscellaneous 7-01 for maximum output details.	
Testing procedure and testing location:		
☒ **CB Testing Laboratory:**		
Testing location/ address	UL Camas 2600 NW Lake Road, Camas WA 98607	
☐ **Associated CB Testing Laboratory:**		
Testing location/ address		
Tested by (name + signature).....	Melissa DeGuia	
Approved by (name + signature)	Bernadette Matsuoka	
☐ **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).....		
Witnessed by (name + signature)		
Approved by (name + signature)		
Supervised by (name + signature).....		

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

N/A

Summary of testing:

No testing conducted

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

Summary of compliance with National Differences

List of countries addressed:

US, CAN, AUSTRIA, REPUBLIC OF KOREA, SWEDEN and UNITED KINGDOM

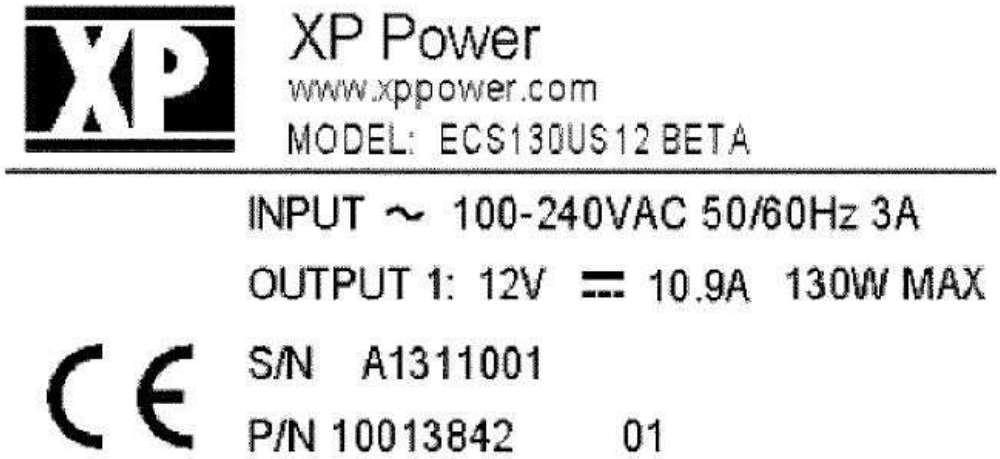
☒ The product fulfils the requirements of IEC 60601-1:2012, Edition 3 with Am. 1

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.

Labels provided are considered representative of the entire series

Note – "BETA" is not to be provided on the final label to be applied to the device.



GENERAL INFORMATION	
Test item particulars (see also Clause 6):	
Classification of installation and use ..... :	Building-in
Device type (component/sub-assembly/ equipment/ system) :	Component power supply
Intended use (Including type of patient, application location) :	To supply regulated power
Mode of operation .....:	Continuous
Supply connection	To be determined in the end product
Accessories and detachable parts included.....:	N/A
Other options include .....:	N/A
Testing	
Date of receipt of test item(s) .....:	N/A
Dates tests performed .....:	N/A
Possible test case verdicts:	
- test case does not apply to the test object .....:	N/A
- test object does meet the requirement.....:	Pass (P)
- test object was not evaluated for the requirement ..... :	N/E (collateral standards only)
- test object does not meet the requirement.....:	Fail (F)
Abbreviations used in the report:	
- normal condition.....: N.C.	- single fault condition.....: S.F.C.
- means of Operator protection .....: MOOP	- means of Patient protection ....: MOPP

General remarks:

"(See Attachment #)" refers to additional information appended to the report.
"(See appended table)" refers to a table appended to the report.
The tests 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 testing laboratory.
List of test equipment must be kept on file and available for review.
Additional test data and/or information provided in the attachments to this report.

Throughout this report a ☐ comma / ☒ point is used as the decimal separator.

Manufacturer's Declaration per sub-clause 4.2.5 of IECEE 02:2012

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..... :

☒ **Yes**
☐ **Not applicable**

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

Name and address of factory (ies)..... :	XP Power LLC, 990 Benecia Ave, Sunnyvale CA 94085, USA XP Power (Kunshan) Limited., 230, Bin Jiang Nan Road, Zhang Pu Town, Kunshan, Jiangsu 215300 China

General product information:

Report Summary
The original report was modified on 2014-12-22 to include the following changes/additions:

Amendment 1:
- Decrease the values of Bleeder Resistors (R1, R2) from 1Mohms to 750kohms. The decrease in resistance rating would result in improved decay of the electric charge on the Capacitor, C1. Thus results from previous testing are considered worse case and representative of the new rating.
- Add Optional PWB Conformal Coating to Table 8.10. No additional testing was deemed necessary as it is not being replied upon for reduced Creepage or Clearance distances.
- Update the Applicant and Manufacturing address from Santa Ana, CA to Tustin, CA.

Product Description
Products covered are open frame power supplies intended for building-in to be used with Medical Electrical Equipment. Units are intended for used with Class I or Class II end-products.

Model Differences

All models in the Model ECS130USxx-yy series are identical with exception to the Mains Transformer, T1, and minor secondary components that allow for different output voltage ratings. Models with suffix C is provided with metal cover for Class I use only. See Miscellaneous Enclosure 7-01 for Output Rating Table

ECS130US15-XA1013 is identical to Model ECS130US15, except for the size of the PWB mounting holes.

Additional Information

No additional testing was deemed necessary to evaluate the models covered under this Report to IEC 60601-1:2012, Edition 3 with Am.1 based on previously conducted testing and the review of product technical documentation including photos, schematics, wiring diagrams, etc. conducted under separate CB Scheme investigation to IEC 60601-1, 3rd ed issued under CBTR No. E146893-A45-CB-1 and CBTC No. US-21655-UL issued on 2013-05-29 and amended on 2013-09-23.

Marking Plate is considered representative of all models covered under this Report.

The clearance distances have additionally been assessed for suitability up to 5000 m elevation.

When submitting this Test Report to other Certification Body, the manufacturer is responsible for providing any additional information that the Body may need in order to issue its Mark, including testing for compliance with the applicable collateral standards.

Manufacturer to provide up to date IEC Licenses for component licenses greater than 3 years upon request.

Technical Considerations
- The product was investigated to the following additional standards: ANSI/AAMI ES60601-1:2005/C1:2009 +AM1(R2012) (includes National Differences for USA); CAN/CSA-C22.2 No. 60601-1:14 (includes National Differences for Canada), EN 60601-1:2006+A1 (2013), IEC 60601-1: 2012, 3rd Edition with Am. 1

- The product was not investigated to the following standards or clauses:: Electromagnetic Compatibility (IEC 60601-1-2), Clause 14, Programmable Electronic Systems, Biocompatibility (ISO 10993-1)

- Scope of Power Supply evaluation defers the following clauses to the be determined as part of the end product: Clause 7.5 (Safety Signs), Clause 7.9 (Accompanying Documents), Clause 9 (ME Hazard),

Clause 10 (Radiation), Clause 14 (PEMS), Clause 16 (ME Systems)

- The product is evaluated only to the following hazards: Casualty, Fire, Shock
- The degree of protection against harmful ingress of water is: Ordinary
- Software is relied upon for meeting safety requirements related to mechanical, fire and shock: No
- The unit has two cooling conditions: 1) External Forced Air Cooling: 10CFM air flow, 1 inch distance from Fan to input side of the unit with inward air-flow direction; 2) Convection cooling. See Enclosure 7-01 for additional details.
- Unit may be used with or without metal cover.

Risk Controls/ Engineering Condition of Acceptability

- The component shall be considered for compliance with the Marking (clause 7) and Separation (clause 8) requirements as part of the end use application evaluation.

- Repeat of leakage current testing and consideration of non-frequency weighted leakage current test (Clause 8.7.3e) shall be considered in the end product application.

- Consideration should be given to measuring the temperature on power electronic components and transformer windings when the power supply is installed in the end-use equipment. The end use product shall ensure that the power supply is used within its ratings.

- This power supply was evaluated with Two MOPP between primary and secondary; One MOPP primary and Earth; One MOPP between secondary and Earth for Class I application; Functional Insulation between secondary and floated earth trace for class II application.

- This power supply has been evaluated as a continuous operation, ordinary equipment and has not been evaluated for use in the presence of a flammable anesthetic mixture with air, oxygen, or nitrous oxide. The output circuits have not been evaluated for direct patient connection (Type B, BF or CF).

- The end product shall ensure that the requirements related to accompanying documents, clause 7.9, are met.

- The available voltage for the secondary outputs does not exceed 25 Vac or 60 Vdc, under normal and single fault conditions.

- The following secondary output circuits are at non-hazardous energy levels: All outputs

- The input/output connectors are not acceptable for field connections; they are only intended for connection to mating connectors of the end-use equipment.

- The maximum investigated branch circuit rating is: 20 A

- The Electric Strength Test conducted on this power supply was based upon a maximum working voltage of: Primary-Earthed Dead Metal (Class I units): 356 Vpk, 245 Vrms; Primary-SEC: 603 Vpk, 225 Vrms.

- When installed in a Class I end product, the power supply shall be mounted in a manner that provides, at a minimum, 3.2 mm Clearance/4 mm Creepage between the primary sides of power supply and protectively earthed accessible conductive parts. In addition, when installed in a Class I end product, the protective bonding terminal of the power supply shall be reliably connected to the main protective earthing terminal of the end product.

- When installed in a Class II end product, the power supply shall be mounted in a manner that provides sufficient clearance and creepage distance between the hazardous parts and any accessible conductive

parts.

- Proper bonding to the end-product main protective earthing termination is required. Grounding continuity shall be conducted in the end product.

- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: 50°C for 100% load (130W) with forced air cooling, derated to 50% load (65W) with forced air cooling at 70°C (applicable to all models); 50°C for 77% load (100W) with convection cooling, derated to 39% (50W) with convection cooling at 70°C (applicable to models without cover); 50°C for 58% load (75W) with convection cooling, derated to 29% (38W) with convection cooling at 70°C (applicable to models with cover). See Enclosure 7-01 for additional details.

- A single input current rating is provided over the entire 100-240Vac voltage range. The end product evaluation is to determine the acceptability.

- Primary side heat sinks are floating and considered live. They should not be accessible in the end product.

- 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): L1, L2 and T1 are Class F, 155°C

- Printed Wiring Board rated 130°C.

- Cleaning test shall be considered as part of end product evaluation.

- The need for Marking Durability and Marking Legibility Testing shall be considered as part of the end product installation.

- Fire/ Mechanical/ Electrical Enclosure to be provided as part of the end product.

- Unit provided with additional suffix "-SF" are provided with only one fuse in the line side. Consideration for the need for additional fusing to be provided as part of the end product

- Units with suffix "C" provided with metal cover.