



NOTICE OF AUTHORIZATION TO APPLY THE UL MARK

11/23/2010

Xp Power Inc
Mr. Tac Pham
Suite 150
1241 E Dyer Rd
Santa Ana Ca 92705, Us

Our Reference: File E146893, Vol. X1 Project Number 10ME06409
Your Reference: T PHAM 7-19-2010
Project Scope: New Medical Power Supply Series, Model ECS65USXX Series

Dear Mr. Tac Pham:

UL's investigation of your product(s) has been completed under the above Reference Number and the product was determined to comply with the applicable requirements.

This letter temporarily supplements the UL Follow-Up Services Procedure and serves as authorization to apply the UL Mark only at authorized factories under UL's Follow-Up Service Program.

To provide the manufacturer with the intended authorization to use the UL Mark, the addressee must send a copy of this notice to each manufacturing location currently authorized in File E146893, Vol. X1.

This authorization is effective from the date of this Notice and only for products at the indicated manufacturing locations. Records in the Follow-Up Services Procedure covering the product are now being prepared and will be sent in the near future. Until then, this letter authorizes application of the UL Mark for 90 days from the date of this letter.

Products that bear the UL Mark shall be identical to those that were evaluated by UL and found to comply with UL's requirements. If changes in construction are discovered, appropriate action will be taken for products not in conformance with UL's requirements and continued use of the UL Mark may be withdrawn. UL may elect to withdraw use of the UL Mark if the Applicant or Manufacturer fails to comply with UL's requirements including ongoing compliance of the product, under UL's Follow-Up Service.



Notice of Authorization - 10ME06409

Any information and documentation provided to you involving UL Mark services are provided on behalf of Underwriters Laboratories Inc. (UL) or any authorized licensee of UL.

The contents of this Letter are intended solely for the use of UL and the Applicant. The opinions and findings of UL represent its judgment given with due consideration to the necessary limitations of practical operation in accordance with UL's objectives and purposes. UL shall not otherwise be responsible for the use of or reliance upon the contents of this letter by anyone. UL shall not incur any obligation or liability for any loss, expense or damages, including incidental, consequential or punitive damages, arising out of or in connection with the use or reliance upon the contents of this letter to anyone other than the Applicant as provided in the agreement between UL and Applicant. Any use or reference to UL's name or certification mark(s) by anyone other than the Applicant in accordance with the agreement is prohibited without the express written approval of UL.

Very truly yours,

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Reviewed by:

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Ben.Vonk@nl.ul.com

BREED8F-249F44



UL TEST REPORT AND PROCEDURE

Standard:	UL 60601-1, 1st Edition, 2006-04-26 (Medical Electrical Equipment, Part 1: General Requirements for Safety) CAN/CSA-C22.2 No. 601.1-M90, 2005 (Medical Electrical Equipment - Part 1: General Requirements for Safety)
Certification Type:	Power Supplies, Medical and Dental
CCN:	QQHM2, QQHM8
Product:	Medical Power Supply
Model:	ECS65USXX (where xx can be any number between 12 and 48 designating the output voltage) may also be follow by suffix "SF" and/or "-B".
Rating:	Input: 100-240 Vac, 1.2 A, 50/60 Hz Output: See Enclosure - Miscellaneous Ratings Table for details.
Applicant Name and Address:	XP POWER INC SUITE 150 1241 E DYER RD SANTA ANA CA 92705 UNITED STATES

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

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

UL authorizes the applicant to reproduce the latest pages of the referenced Test Report consisting of the first page of the Specific Technical Criteria through to the end of the Conditions of Acceptability.

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

Prepared by: Linus Park
Underwriters Laboratories Inc.
Reviewed by: Ben Vonk
Underwriters Laboratories Inc.



Supporting Documentation

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

- A. Authorization - The Authorization page may include additional Factory Identification Code markings.
- B. Generic Inspection Instructions -
 - i. Part AC details important information which may be applicable to products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of this Test Report.
 - ii. Part AE details any requirements which may be applicable to all products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of each Test Report.
 - iii. Part AF details the requirements for the UL Certification Mark which is not controlled by the technical standard used to investigate these products. Products are permitted to bear only the Certification Mark(s) corresponding to the countries for which it is certified, as indicated in each Test Report.

Product Description

The 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-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 Below for 50° Ambient:

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, 1.3 A

See Enclosures 7-01 and 7-02 for de-rating information.

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

Suffix "-B" indicates unit provided with optional EMI Inductor, L2.

Technical Considerations

- Classification of installation and use : For Building-in
- Supply connection : For Building-in
- Accessories and detachable parts included in the evaluation : None
- Options included : Can be used with 10 cfm externally powered fan
- The product was investigated to the following additional standards:: UL 60601-1, 1st Edition, 2006-04-26 (includes National Differences for USA) EN 60601-1: 1990 + A1:1993 + A2:1995, CAN/CSA-C22.2 No. 601.1-M90 (R2005) (includes National Differences for Canada), (except EMC limitations, EN 60601-1-2, Biocompatibility, EN 10993-1, Programmable Electronic Systems, IEC 60601-1-4)
- The product was not investigated to the following standards or clauses:: Clause 36, Electromagnetic Compatibility (IEC 601-1-2), Clause 48, Biocompatibility (ISO 10993-1), Clause 52.1, Programmable Electronic Systems (IEC 601-1-4)
- The product is Classified only to the following hazards:: Casualty, Fire, Shock
- The degree of protection against harmful ingress of water is:: Ordinary
- The mode of operation is:: Continuous

- Software is relied upon for meeting safety requirements related to mechanical, fire and shock:: No
- The product is suitable for use in the presence of a flammable anesthetics mixture with air or oxygen or with nitrous oxide:: No

Engineering Conditions of Acceptability

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

- This component has been judged on the basis of the required spacings in the Second Edition of the Standards for Medical Electrical Equipment, Part 1: General Requirements for Safety, UL 60601-1, which covers the end use product for which the component is designed.
- The component shall be installed in compliance with the enclosure (clause 16), marking (clause 6.1,6.4) and separation (clause 17) requirements of the end use 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.
- Leakage current testing should be conducted in the end product application.
- Grounding continuity should be conducted in the end product for Class I end-product applications.
- This power supply was evaluated as Reinforced insulation between primary and secondary; Basic insulation between primary and primary side mounting holes; and Operational insulation between secondary and secondary side mounting holes.
- This power supply has been evaluated as with a earth, 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 should ensure that the requirements related to accompanying documents, clause 6.8, are met. ,
- The available voltage for the secondary outputs does not exceed 25 Vac or 60 Vdc, under normal and single fault conditions.
- The input/output connectors are not acceptable for field connections, they are only intended for connection to mating connectors of internal wiring inside the end-use machine.

- Heat Sink 1 was considered floating live and should not be connected to earth in the end-product.
- The power supply should be mounted on insulating posts when installed in a Class II end product.
- The "floating" mounting holes shall be mounted on insulating posts or properly earthed for Class I end-product.
- Units may be provided with one fuse in the Line side or one fuse in both the Line and Neutral sides. The need for additional fusing shall be determined as part of the end-product evaluation.

Additional Information

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

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, 2.5 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. 5 mm Clearance between the power supply and any accessible conductive parts.

Enclosed label considered representative of all models covered in this CB Test Report.

This reports contains component licenses or certificates that are older than 3 years or documentation with online proof of certification. It has being determined that the components comply with current safety requirements. Acceptance of these documentation, licenses or certificates is at the discretion of the Receiving NCB.

Markings and instructions

Clause Title	Marking or Instruction Details
Company identification	Classified or Recognized company's name, Trade name, Trademark or File
Model	Model number
Supply Connection	Voltage range, ac/dc, phases if more than single phase
Alternating current	
Direct current	
Supply Frequency	Rated frequency range in hertz
Power Input	Amps, VA, or Watts
Fuses	Ratings (current and voltage) and type. (located adjacent to fuse OR as a diagram inside enclosure)
Output	Rated output voltage, power, frequency.



NOTICE OF AUTHORIZATION TO APPLY THE UL MARK

10/19/2010

Xp Power Inc
Mr. Tac Pham
Suite 150
1241 E Dyer Rd
Santa Ana Ca 92705, Us

Our Reference: File E139109, Vol. X1 Project Number 10CA37048
Your Reference: TAC PHAM
Project Scope: New Power Supply Series, Model ECS65USXX Series

Dear Mr. Tac Pham:

UL's investigation of your product(s) has been completed under the above Reference Number and the product was determined to comply with the applicable requirements.

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Notice of Authorization - 10CA37048

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The contents of this Letter are intended solely for the use of UL and the Applicant. The opinions and findings of UL represent its judgment given with due consideration to the necessary limitations of practical operation in accordance with UL's objectives and purposes. UL shall not otherwise be responsible for the use of or reliance upon the contents of this letter by anyone. UL shall not incur any obligation or liability for any loss, expense or damages, including incidental, consequential or punitive damages, arising out of or in connection with the use or reliance upon the contents of this letter to anyone other than the Applicant as provided in the agreement between UL and Applicant. Any use or reference to UL's name or certification mark(s) by anyone other than the Applicant in accordance with the agreement is prohibited without the express written approval of UL.

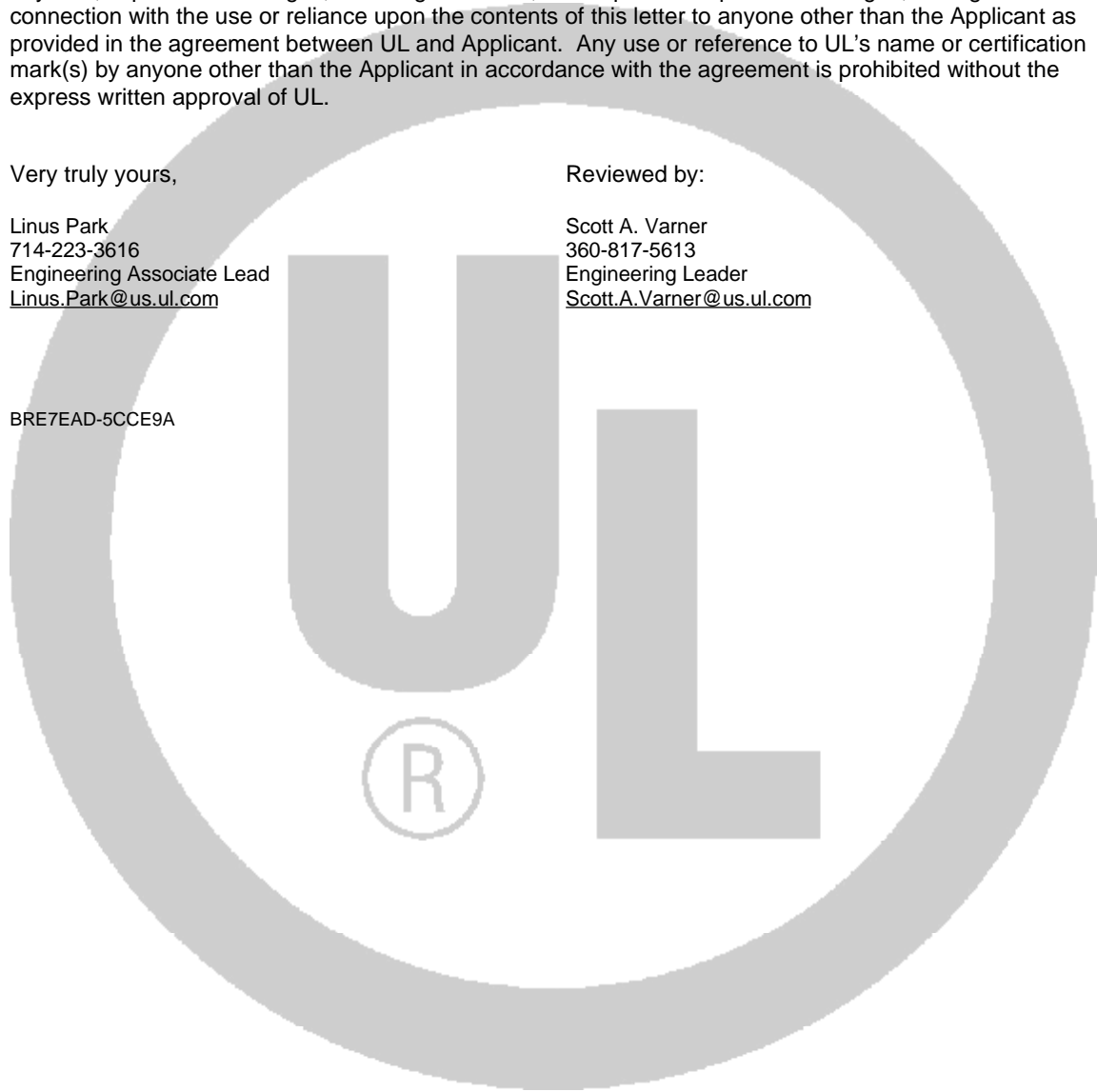
Very truly yours,

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Reviewed by:

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Engineering Leader
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BRE7EAD-5CCE9A



UL TEST REPORT AND PROCEDURE

Standard:	UL 60950-1, 2nd Edition, 2007-03-27 (Information Technology Equipment - Safety - Part 1: General Requirements) CSA C22.2 No. 60950-1-07, 2nd Edition, 2007-03 (Information Technology Equipment - Safety - Part 1: General Requirements)
Certification Type:	Power Supplies for Information Technology Equipment Including Electrical Business Equipment
CCN:	QQGQ2, QQGQ8
Product:	Switching Power Supply
Model:	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"
Rating:	Input: 100-240 Vac, 1.2 A, 50/60 Hz Output: See Enclosure - Miscellaneous Ratings Table for details.
Applicant Name and Address:	XP POWER INC SUITE 150 1241 E DYER RD SANTA ANA CA 92705 UNITED STATES

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

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Prepared by: Linus Park
Underwriters Laboratories Inc.
Reviewed by: Scott Varner
Underwriters Laboratories Inc.



Supporting Documentation

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

- A. Authorization - The Authorization page may include additional Factory Identification Code markings.
- B. Generic Inspection Instructions -
 - i. Part AC details important information which may be applicable to products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of this Test Report.
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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.

Technical Considerations

- 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%
- 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 (A) : 1.2 A
- Pollution degree (PD) : PD 2
- IP protection class : IPX0
- Altitude of operation (m) : 3000
- Altitude of test laboratory (m) : 33
- Mass of equipment (kg) : 0.25 kg
- The product was submitted and evaluated for use at the maximum ambient temperature (T_{ma}) permitted by the manufacturer's specification of: 50°C (See De-rating Curve, Enclosure 7-01 for details)
- The means of connection to the mains supply is: for building-in
- The product is intended for use on the following power systems: TN
- The product was investigated to the following additional standards: EN 60950-1:2006+ A11:2009 (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

For use only in or with complete equipment where the acceptability of the combination is determined by Underwriters Laboratories Inc. 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: 244 Vrms, 359 Vpk, Primary-SELV: 249 Vrms, 588 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 3000 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.

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.

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.

Markings and instructions

Clause Title	Marking or Instruction Details
Power rating - Company identification	Listee's or Recognized company's name, Trade Name, Trademark or File Number
Power rating - Model	Model Number
Power rating - Ratings	Ratings (voltage, frequency/dc, current)
Fuses - Non-operator access/soldered-in fuses	Unambiguous reference to service documentation for instructions for replacement of fuses replaceable only by service personnel
Terminals for external primary power supply conductors	Capital letter "N" located adjacent to a terminal intended exclusively for connection of the primary power neutral conductor

Special Instructions to UL Representative



NOTICE OF AUTHORIZATION TO APPLY THE UL MARK

03/27/2009

Xp Power Inc
Mr. Tac Pham
1590 S Sinclair St
Anaheim Ca 92806, Us

Our Reference: File E139109, Vol. TO BE DETERMINED Project Number 08CA60450
Your Reference: TAC PHAM
Project Scope: UL/CUL New Power Supply Series, Model ECS100USXX Series

Dear Mr. Tac Pham:

UL's investigation of your product(s) has been completed under the above Reference Number and the product was determined to comply with the applicable requirements.

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Notice of Authorization - 08CA60450

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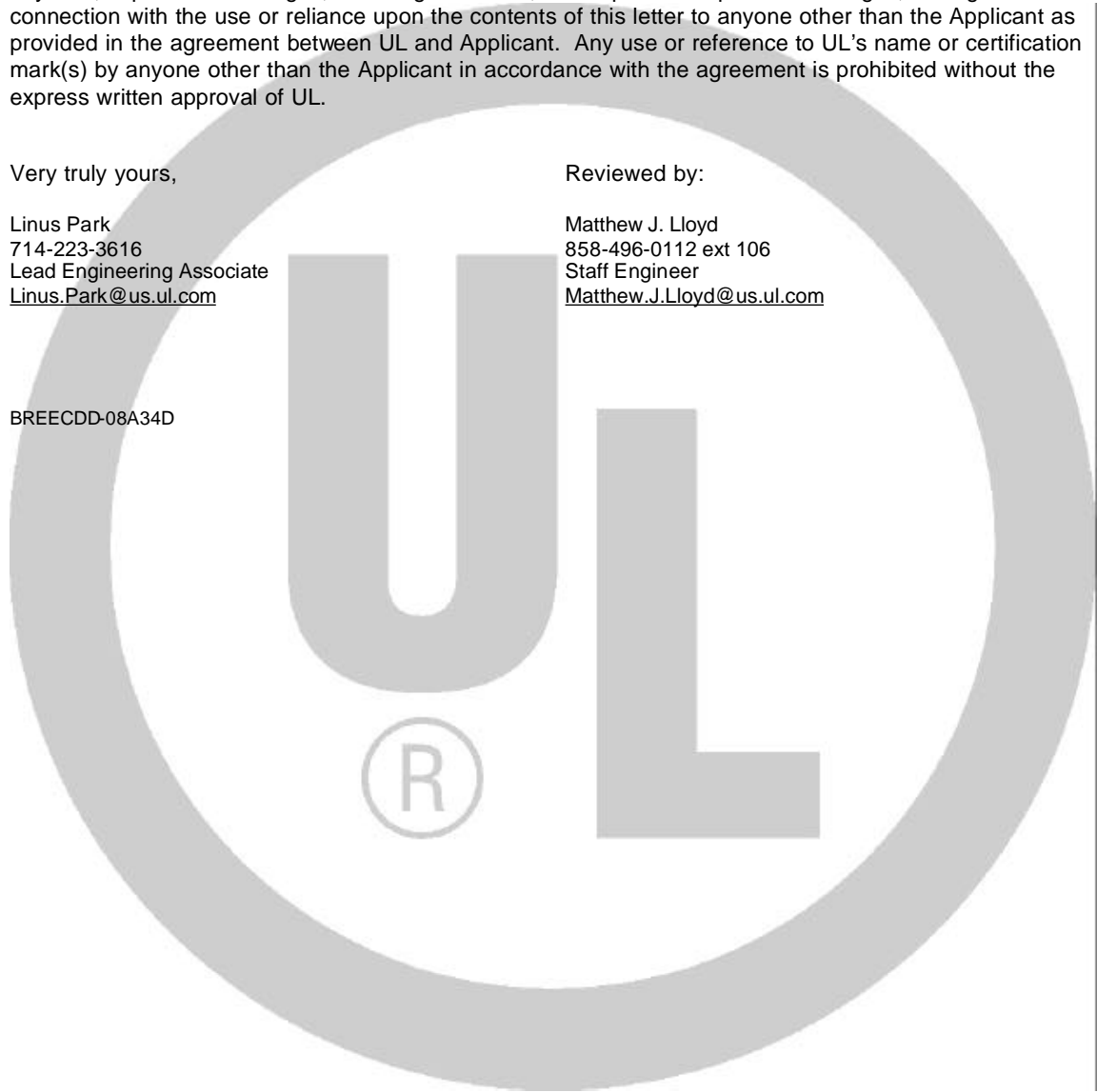
Very truly yours,

Linus Park
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Lead Engineering Associate
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Reviewed by:

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BREECDD-08A34D



COVER PAGE FOR TEST REPORT

Product Category:	Power Supplies for Information Technology Equipment Including Electrical Business Equipment
Product Category CCN:	QQGQ2, QQGQ8
Test Procedure:	Component Recognition
Product:	Power supply for building-in, switch mode type
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"
Rating(s):	Input: 100-240 Vac, 1.9 A, 50/60 Hz Output: See Enclosure - Miscellaneous Ratings Table for details.
Standards:	UL 60950-1, 2nd Edition, 2007-03-27 (Information Technology Equipment - Safety - Part 1: General Requirements) CSA C22.2 No. 60950-1-07, 2nd Edition, 2007-03 (Information Technology Equipment - Safety - Part 1: General Requirements)
Applicant Name and Address:	XP POWER INC 1590 S SINCLAIR ST ANAHEIM CA 92806 UNITED STATES
This Report includes the following parts, in addition to this cover page:	
<ol style="list-style-type: none">1. Specific Inspection Criteria2. Specific Technical Criteria3. Clause Verdicts4. Critical Components5. Test Results6. National Differences7. Enclosures	

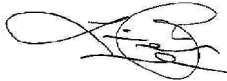
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Test Report By:



Linus Park
Lead Engineering Associate
Underwriters Laboratories Inc.

Reviewed By:



Matthew Lloyd
Staff Engineer
Underwriters Laboratories Inc.

SPECIFIC INSPECTION CRITERIA

BA1.0	Special Instructions to UL Representative
BA1.1	N/A

BB1.0	Supporting Documentation
BB1.1	<p>The following documents located at the beginning of this Procedure supplement the requirements of this Test Report:</p> <p>A. Authorization - The Authorization page may include additional Factory Identification Code markings.</p> <p>B. Generic Inspection Instructions -</p> <p style="padding-left: 20px;">i. Part AC details important information which may be applicable to products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of this Test Report.</p> <p style="padding-left: 20px;">ii. Part AE details any requirements which may be applicable to all products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of each Test Report.</p> <p style="padding-left: 20px;">iii. Part AF details the requirements for the UL Certification Mark which is not controlled by the technical standard used to investigate these products. Products are permitted to bear only the Certification Mark(s) corresponding to the countries for which it is certified, as indicated in each Test Report.</p>


BC1.0	Markings and instructions	
BC1.1	The following markings and instructions are provided as indicated.	
BC1.2	All clause references are from UL 60950-1, 2nd Edition, 2007-03-27 (Information Technology Equipment - Safety - Part 1: General Requirements).	
Standard Clause	Clause Title	Marking or Instruction Details
1.7.1	Power rating - Company identification	Listee's or Recognized company's name, Trade Name, Trademark or File Number
	Power rating - Model	Model Number
	Power rating - Ratings	Ratings (voltage, frequency/dc, current)
1.7.6	Fuses - Non-operator access/soldered-in fuses	Unambiguous reference to service documentation for instructions for replacement of fuses replaceable only by service personnel
1.7.7.2	Terminals for external primary	Capital letter "N" located adjacent to a terminal intended exclusively for connection of the primary power neutral conductor

	power supply conductors	
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BD1.0	Production-Line Testing Requirements						
BD1.1	Electric Strength Test Special Constructions - Refer to Generic Inspection Instructions, Part AC for further information.						
					Test Potential		
	Model	Component	Removable Parts	Test probe location	V rms	V dc	Test Time, s
	N/A						
BD1.2	Earthing Continuity Test Exemptions - This test is not required for the following models:						
BD1.3	Electric Strength Test Exemptions - This test is not required for the following models:						
BD1.4	Electric Strength Test Component Exemptions - The following solid-state components may be disconnected from the remainder of the circuitry during the performance of this test:						

BE1.0	Sample and Test Specifics for Follow-Up Tests at UL					
BE1.1	Model	Component	Material	Test	Sample(s)	Test Specifics
	N/A					

SPECIFIC TECHNICAL CRITERIA

UL 60950-1:2005 (2nd Edition) Information technology equipment - Safety - Part 1: General requirements	
Report Reference No	E139109-A24-UL-1
Compiled by	Linus Park
Reviewed by	Matthew Lloyd
Date of issue	2009-04-07
Standards	UL 60950-1, 2nd Edition, 2007-03-27 (Information Technology Equipment - Safety - Part 1: General Requirements) CSA C22.2 No. 60950-1-07, 2nd Edition, 2007-03 (Information Technology Equipment - Safety - Part 1: General Requirements)
Test procedure	Component Recognition
Non-standard test method	N/A
Test item description	Power supply for building-in, switch mode type
Trademark	
Model and/or type reference	ECS100USxx (where xx can be any number between 12 and 48 designating the output voltage), may also be provided with suffix "SF"
Rating(s)	Input: 100-240 Vac, 1.9 A, 50/60 Hz Output: See Enclosure - Miscellaneous Ratings Table for details.

Particulars: test item vs. test requirements	
Equipment mobility	for building-in
Connection to the mains	for building-in
Operating condition	continuous
Over voltage category	OVC II
Mains supply tolerance (%)	+6%, -10%
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)
Mass of equipment (kg)	0.17 kg
Pollution degree	PD 2
IP protection class	IPX0

Possible test case verdicts:	
- test case does not apply to the test object	N / A
- test object does meet the requirement	Pass
- test object does not meet the requirement	Fail (acceptable only if a corresponding, less stringent national requirement is "Pass")

General remarks:	
- "(see Enclosure #)" refers to additional information appended to the Test Report	
- "(see appended table)" refers to a table appended to the Test Report	
- Throughout the Test Report a point is used as the decimal separator	

GENERAL PRODUCT INFORMATION:	
CA1.0	Report Summary
CA1.1	N/A
CB1.0	Product Description
CB1.1	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.
CC1.0	Model Differences
CC1.1	<p>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:</p> <p>Model ECS100US12: Output Rated: 12 Vdc, 8.3 A Model ECS100US15: Output Rated: 15 Vdc, 6.7 A Model ECS100US15: Output Rated: 18 Vdc, 5.5 A Model ECS100US24: Output Rated: 24 Vdc, 4.2 A Model ECS100US28: Output Rated: 28 Vdc, 3.6 A Model ECS100US48: Output Rated: 48 Vdc, 2.1 A</p> <p>Additional Suffix "SF" denotes units with only a single line side fuse.</p>
CD1.0	Additional Information
CD1.1	<p>The need for the additional testing and evaluation shall be determined in the end product investigation.</p> <p>The nameplate markings provided as an Enclosure - Marking Plate are considered representative of the entire series.</p> <p>The power supply series covered by this report employ Double/Reinforced Insulation between Primary and Secondary circuits.</p> <p>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.</p> <p>When installed in a Class II end product, the power supply shall be mounted, on insulating posts, in a manner that provides, at a minimum, 4 mm Clearance between the power supply and any accessible conductive parts.</p>

CE1.0	Technical Considerations
CE1.2	The product was submitted and evaluated for use at the maximum ambient temperature (T _{ma}) permitted by the manufacturer's specification of: 50°C (See De-rating Curve, Enclosure 7-01 for details)
CE1.3	The means of connection to the mains supply is: for building-in
CE1.4	The product is intended for use on the following power systems: TN
CE1.8	The following accessible locations (with circuit/schematic designation) are within a limited current circuit: Load side of C17 (Pri to Sec bridging capacitor),
CE2.0	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. --
CF1.0	Engineering Conditions of Acceptability
CF1.1	For use only in or with complete equipment where the acceptability of the combination is determined by Underwriters Laboratories Inc. When installed in an end-product, consideration must be given to the following:
CF1.2	The following Production-Line tests are conducted for this product: Electric Strength
CF1.3	The end-product Electric Strength Test is to be based upon a maximum working voltage of: Primary-SELV: 193 Vrms, 547 Vpk,
CF1.5	The following secondary output circuits are SELV: All outputs
CF1.7	The following secondary output circuits are at non-hazardous energy levels: All outputs
CF1.10	The following output terminals were referenced to earth during performance testing: Secondary Output (J2) referenced using "Y1" capacitors.
CF1.11	The power supply terminals and/or connectors are: Suitable for factory wiring only
CF1.12	The maximum investigated branch circuit rating is: 20 A
CF1.13	The investigated Pollution Degree is: 2
CF1.15	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., ,
CF1.16	An investigation of the protective bonding terminals has: Not been conducted
CF1.17	The following input terminals/connectors must be connected to the end-product supply neutral: ACN J1
CF1.18	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, 130°C)
CF1.19	The following end-product enclosures are required: Fire, Electrical
CF1.23	The equipment is suitable for direct connection to: AC mains supply
CF2.0	Printed Wiring Board rated 130°C.
CF2.1	The equipment is provided with a fuse in both the Line and Neutral of the primary circuit.

CF2.2	Heatsinks are floating and considered live. They should not be accessible in the end-product.
CF2.3	Touch Current test to be conducted in the end-product evaluation.
CF2.4	Clearance spacing evaluated for 3000 m altitude. Additional consideration maybe necessary in the end-use product.



NOTICE OF AUTHORIZATION TO APPLY THE UL MARK

03/27/2009

Xp Power Inc
Mr. TAC PHAM
1590 S Sinclair St
Anaheim Ca 92806, Us

Our Reference: File E146893, Vol. 1 Project Number 09ME02631
Your Reference: TAC PHAM
Project Scope: Power Supply Series Evaluation (1 Output), Model ECS100US Series

Dear Mr. TAC PHAM:

UL's investigation of your product(s) has been completed under the above Reference Number and the product was determined to comply with the applicable requirements.

This letter temporarily supplements the UL Follow-Up Services Procedure and serves as authorization to apply the UL Mark only at authorized factories under UL's Follow-Up Service Program.

To provide the manufacturer with the intended authorization to use the UL Mark, the addressee must send a copy of this notice to each manufacturing location currently authorized in File E146893, Vol. 1.

This authorization is effective from the date of this Notice and only for products at the indicated manufacturing locations. Records in the Follow-Up Services Procedure covering the product are now being prepared and will be sent in the near future. This letter authorizes application of the UL Mark for 90 days from the date of this letter.

Products that bear the UL Mark shall be identical to those that were evaluated by UL and found to comply with UL's requirements. If changes in construction are discovered, appropriate action will be taken for products not in conformance with UL's requirements and continued use of the UL Mark may be withdrawn. UL may elect to withdraw use of the UL Mark if the Applicant or Manufacturer fails to comply with UL's requirements including ongoing compliance of the product, under UL's Follow-Up Service.

Notice of Authorization - 09ME02631

Any information and documentation provided to you involving UL Mark services are provided on behalf of Underwriters Laboratories Inc. (UL) or any authorized licensee of UL.

The contents of this Letter are intended solely for the use of UL and the Applicant. The opinions and findings of UL represent its judgment given with due consideration to the necessary limitations of practical operation in accordance with UL's objectives and purposes. UL shall not otherwise be responsible for the use of or reliance upon the contents of this letter by anyone. UL shall not incur any obligation or liability for any loss, expense or damages, including incidental, consequential or punitive damages, arising out of or in connection with the use or reliance upon the contents of this letter to anyone other than the Applicant as provided in the agreement between UL and Applicant. Any use or reference to UL's name or certification mark(s) by anyone other than the Applicant in accordance with the agreement is prohibited without the express written approval of UL.

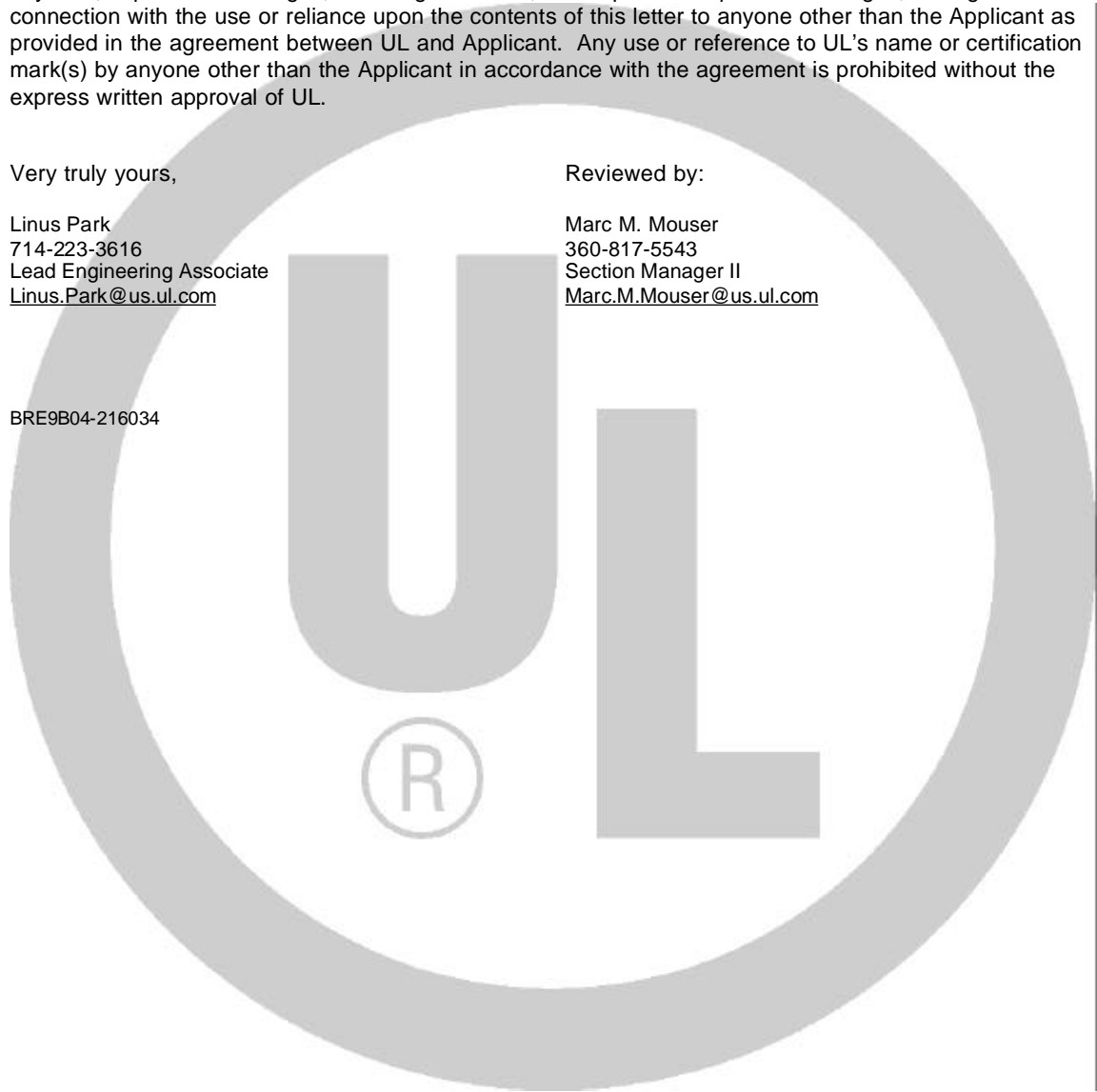
Very truly yours,

Linus Park
714-223-3616
Lead Engineering Associate
Linus.Park@us.ul.com

Reviewed by:

Marc M. Mouser
360-817-5543
Section Manager II
Marc.M.Mouser@us.ul.com

BRE9B04-216034



COVER PAGE FOR TEST REPORT

Product Category:	Power Supplies, Medical and Dental
Product Category CCN:	QQHM2, QQHM8
Test Procedure:	Component Recognition
Product:	Medical Power Supply
Model/Type Reference:	ECS100USxx (where xx can be any number between 12 and 48 designating the output voltage) may also be follow by suffix SF.
Rating(s):	Input: 100-240 Vac, 1.9 A, 50/60 Hz Output: See Enclosure - Miscellaneous Ratings Table for details.
Standards:	UL 60601-1, 1st Edition, 2006-04-26 (Medical Electrical Equipment, Part 1: General Requirements for Safety) CAN/CSA-C22.2 No. 601.1-M90, 2005 (Medical Electrical Equipment - Part 1: General Requirements for Safety)
Applicant Name and Address:	XP POWER INC 1590 S SINCLAIR ST ANAHEIM CA 92806, USA
This Report includes the following parts, in addition to this cover page:	
<ol style="list-style-type: none">1. Specific Inspection Criteria2. Specific Technical Criteria3. Clause Verdicts4. Critical Components5. Test Results6. National Differences7. Enclosures	

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

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

UL authorizes the applicant to reproduce the latest pages of the referenced Test Report consisting of the first page of the Specific Technical Criteria through to the end of the Conditions of Acceptability.

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

Test Report By:



Linus Park
Lead Engineering Associate
Underwriters Laboratories Inc.

Reviewed By:





Marc M. Mouser
Manager
Underwriters Laboratories Inc.

SPECIFIC INSPECTION CRITERIA


BA1.0	Special Instructions to UL Representative
BA1.1	N/A

BB1.0	Supporting Documentation
BB1.1	<p>The following documents located at the beginning of this Procedure supplement the requirements of this Test Report:</p> <ul style="list-style-type: none">A. Authorization - The Authorization page may include additional Factory Identification Code markings.B. Generic Inspection Instructions -<ul style="list-style-type: none">i. Part AC details important information which may be applicable to products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of this Test Report.ii. Part AE details any requirements which may be applicable to all products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of each Test Report.iii. Part AF details the requirements for the UL Certification Mark which is not controlled by the technical standard used to investigate these products. Products are permitted to bear only the Certification Mark(s) corresponding to the countries for which it is certified, as indicated in each Test Report.

BC1.0	Markings and instructions	
BC1.1	The following markings and instructions are provided as indicated.	
BC1.2	All clause references are from UL 60601-1, 1st Edition, 2006-04-26 (Medical Electrical Equipment, Part 1: General Requirements for Safety).	
Standard Clause	Clause Title	Marking or Instruction Details
6.1e	Company identification	Classified or Recognized company's name, Trade name, Trademark or File
6.1f	Model	Model number
6.1g	Supply Connection	Voltage range, ac/dc, phases if more than single phase
	Alternating current	
	Direct current	
6.1h	Supply Frequency	Rated frequency range in hertz
6.1j	Power Input	Amps, VA, or Watts
6.1p	Output	Rated output voltage, power, frequency.

BD1.0	Production-Line Testing Requirements			
BD1.1	Test Exemptions - The following models are exempt from the indicated test			
	Model	Grounding Continuity	Dielectric Voltage Withstand	Patient Circuit Dielectric Voltage Withstand
	All Models	Exempt	Test	Exempt
BD1.2	Solid-State Component Test Exemptions - The following solid-state components may be disconnected from the remainder of the circuitry during either Dielectric Voltage Withstand Test:			
	N/A			
BE1.0	Sample and Test Specifics for Follow-Up Tests at UL			
BE1.1	The following tests shall be conducted in accordance with the Generic Inspection Instructions			
	Model	Samples	Test	Test Details
	N/A			

SPECIFIC TECHNICAL CRITERIA

<p>TEST REPORT UL 60601-1 Medical Electrical Equipment Part 1: General requirements for safety</p>	
Report Reference No	E146893-A13-UL-1
Compiled by	Linus Park
Reviewed by	Marc M. Mouser
Date of issue	2009-04-07
Standards	UL 60601-1, 1st Edition, 2006-04-26 (Medical Electrical Equipment, Part 1: General Requirements for Safety) CAN/CSA-C22.2 No. 601.1-M90, 2005 (Medical Electrical Equipment - Part 1: General Requirements for Safety)
Test procedure	Component Recognition
Non-standard test method	N/A
Test item description	Medical Power Supply
Trademark	
Model and/or type reference	ECS100USxx (where xx can be any number between 12 and 48 designating the output voltage) may also be follow by suffix SF.
Rating(s)	Input: 100-240 Vac, 1.9 A, 50/60 Hz Output: See Enclosure - Miscellaneous Ratings Table for details.

GENERAL INFORMATION		
Test item particulars (see also clause 5):		
Classification of installation and use	For Building-in	
Supply connection	For Building-in	
Accessories and detachable parts included in the evaluation	None	
Options included	Can be used with 10 cfm externally powered fan	
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) (acceptable only if a corresponding, less stringent national requirement is "Pass")	
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
General remarks:		
- "(see Enclosure #)" refers to additional information appended to the Test Report		
- "(see appended table)" refers to a table appended to the Test Report		
- Throughout the Test Report a point is used as the decimal separator		

General Product Information:	
CA1.0	Report Summary
CA1.1	N/A
CB1.0	Product Description
CB1.1	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.
CC1.0	Model Differences
CC1.1	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:

	<p>Model ECS100US12: Output Rated: 12 Vdc, 8.3 A Model ECS100US15: Output Rated: 15 Vdc, 6.7 A Model ECS100US18: Output Rated: 18 Vdc, 5.5 A Model ECS100US24: Output Rated: 24 Vdc, 4.2 A Model ECS100US28: Output Rated: 28 Vdc, 3.6 A Model ECS100US48: Output Rated: 48 Vdc, 2.1 A</p> <p>Suffix "SF" indicates single fuse provided in the line side of the primary.</p>	
CD1.0	Additional Information	
CD1.1	<p>The need for the additional testing and evaluation shall be determined in the end product investigation.</p> <p>The power supply series covered by this report employ Double/Reinforced Insulation between Primary and Secondary circuits.</p> <p>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 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.</p> <p>When installed in a Class II end product, the power supply shall be mounted, on insulating posts, in a manner that provides, at a minimum, 5 mm Clearance between the power supply and any accessible conductive parts.</p>	
CE1.0	Technical Considerations	
CE1.1	The product was investigated to the following additional standards:	UL 60601-1, 1st Edition, 2006-04-26 (includes National Differences for USA) EN 60601-1: 1990 + A1:1993 + A2:1995, CAN/CSA-C22.2 No. 601.1-M90 (R2005) (includes National Differences for Canada), (except EMC limitations, EN 60601-1-2, Biocompatibility, EN 10993-1, Programmable Electronic Systems, IEC 60601-1-4)
CE1.2	The product was not investigated to the following standards or clauses:	Clause 36, Electromagnetic Compatibility (IEC 601-1-2), Clause 48, Biocompatibility (ISO 10993-1), Clause 52.1, Programmable Electronic Systems (IEC 601-1-4)
CE1.3	The product is Classified only to the following hazards:	Casualty, Fire, Shock
CE1.4	The degree of protection against harmful ingress of water is:	Ordinary
CE1.6	The mode of operation is:	Continuous
CE1.7	Software is relied upon for meeting safety requirements related to mechanical. fire and	No

	shock:	
CE1.8	The product is suitable for use in the presence of a flammable anesthetics mixture with air or oxygen or with nitrous oxide:	No
CF1.0	Engineering Conditions of Acceptability	
CF1.1	For use only in or with complete equipment where the acceptability of the combination is determined by Underwriters Laboratories Inc. When installed in an end-product, consideration must be given to the following:	
CF2.0	This component has been judged on the basis of the required spacings in the Second Edition of the Standards for Medical Electrical Equipment, Part 1: General Requirements for Safety, UL 60601-1, which covers the end use product for which the component is designed.	--
CF2.1	The component shall be installed in compliance with the enclosure (clause 16), marking (clause 6.1,6.4) and separation (clause 17) requirements of the end use application.	--
CF2.2	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.	--
CF2.3	Leakage current testing should be conducted in the end product application.	--
CF2.4	Grounding continuity should be conducted in the end product for Class I end-product applications.	--
CF2.5	This power supply was evaluated as Reinforced insulation between primary and secondary; Basic insulation between primary and functional earth; Basic insulation between secondary and functional earth.	--
CF2.6	This power supply has been evaluated as with a functional earth, 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).	--
CF2.7	The end product should ensure that the requirements related to accompanying documents, clause 6.8, are met.,	--

CF2.8	The available voltage for the secondary outputs does not exceed 25 Vac or 60 Vdc, under normal and single fault conditions.	--
CF2.9	The input/output connectors are not acceptable for field connections, they are only intended for connection to mating connectors of internal wiring inside the end-use machine.	--
CF3	The power supply was tested with and without an externally powered 10 cfm fan.	--
CF3.1	Heatsink 1 was considered floating live and should not be connected to earth in the end-product.	--
CF3.2	The power supply should be mounted on insulating posts when installed in a Class II end product.	--
CF3.3	The "floating" mounting hole shall be mounted on insulating post or properly earthed for Class I end-product.	--
CF3.4	Units may be provided with one fuse in the Line side or one fuse in both the Line and Neutral sides. The need for additional fusing shall be determined as part of the end-product evaluation.	--



the standard in safety

Underwriters
Laboratories

NOTICE OF AUTHORIZATION TO APPLY THE UL MARK

10/14/2011

Xp Power Inc
Mr. Tac Pham
Suite 150
1241 E Dyer Rd
Santa Ana Ca 92705, Us

Our Reference: File E139109, Vol.X1 Project Number 11CA32424
Your Reference: TAC PHAM
Project Scope: UL/cUL: Power Supply, New Model ECS100USXX-B Series

Dear Mr. Tac Pham:

UL's investigation of your product(s) has been completed under the above Reference Number and the product was determined to comply with the applicable requirements.

This letter temporarily supplements the UL Follow-Up Services Procedure and serves as authorization to apply the UL Mark only at authorized factories under UL's Follow-Up Service Program.

To provide the manufacturer with the intended authorization to use the UL Mark, the addressee must send a copy of this notice to each manufacturing location currently authorized in File E139109, Vol.X1.

This authorization is effective from the date of this Notice and only for products at the indicated manufacturing locations. Records in the Follow-Up Services Procedure covering the product are now being prepared and will be sent in the near future. Until then, this letter authorizes application of the UL Mark for 90 days from the date of this letter.

Products that bear the UL Mark shall be identical to those that were evaluated by UL and found to comply with UL's requirements. If changes in construction are discovered, appropriate action will be taken for products not in conformance with UL's requirements and continued use of the UL Mark may be withdrawn. UL may elect to withdraw use of the UL Mark if the Applicant or Manufacturer fails to comply with UL's requirements including ongoing compliance of the product, under UL's Follow-Up Service.



Any information and documentation provided to you involving UL Mark services are provided on behalf of Underwriters Laboratories Inc. (UL) or any authorized licensee of UL.

The contents of this Letter are intended solely for the use of UL and the Applicant. The opinions and findings of UL represent its judgment given with due consideration to the necessary limitations of practical operation in accordance with UL's objectives and purposes. UL shall not otherwise be responsible for the use of or reliance upon the contents of this letter by anyone. UL shall not incur any obligation or liability for any loss, expense or damages, including incidental, consequential or punitive damages, arising out of or in connection with the use or reliance upon the contents of this letter to anyone other than the Applicant as provided in the agreement between UL and Applicant. Any use or reference to UL's name or certification mark(s) by anyone other than the Applicant in accordance with the agreement is prohibited without the express written approval of UL.

Very truly yours,

Longjie Zhang

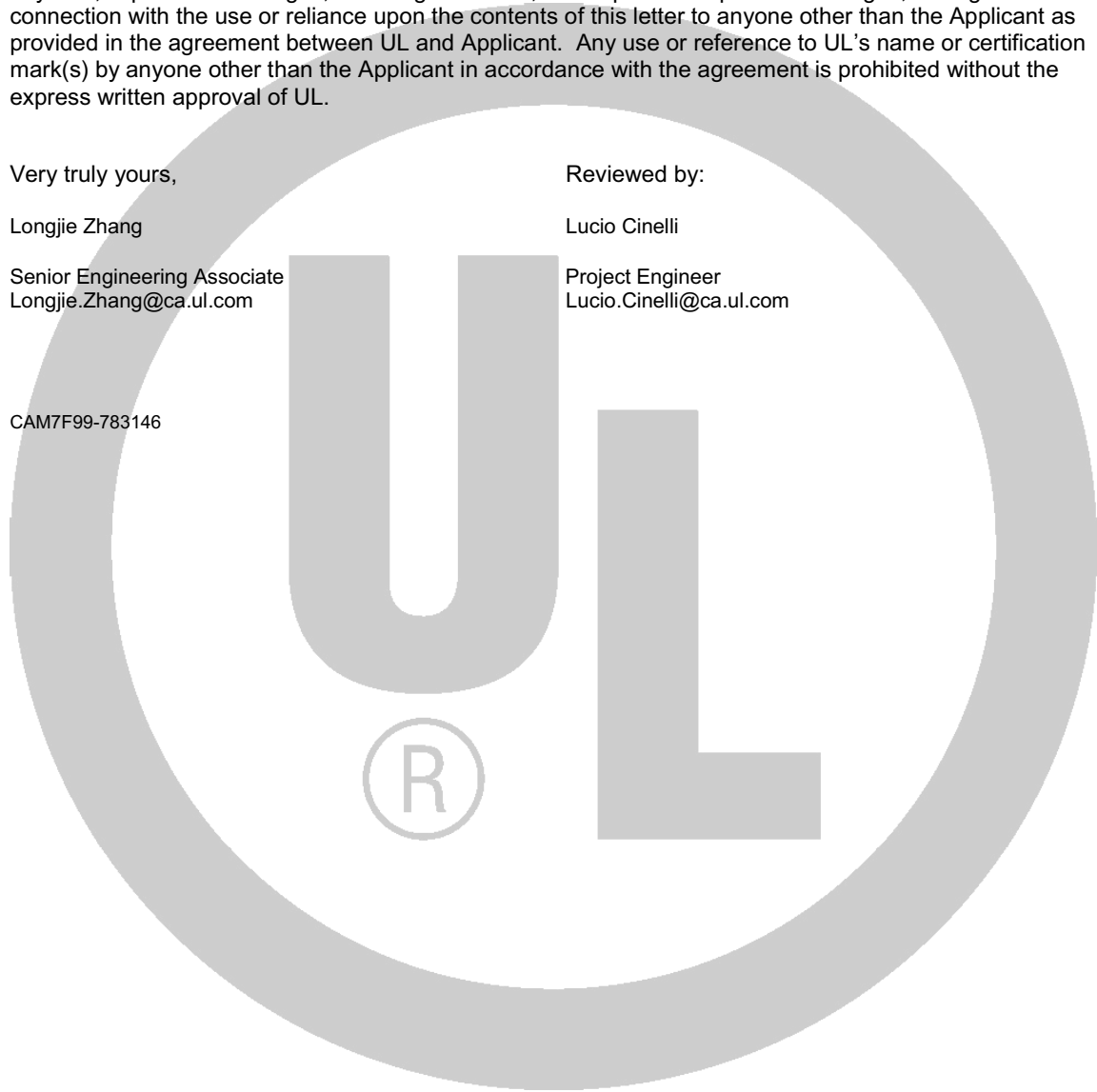
Senior Engineering Associate
Longjie.Zhang@ca.ul.com

CAM7F99-783146

Reviewed by:

Lucio Cinelli

Project Engineer
Lucio.Cinelli@ca.ul.com



UL TEST REPORT AND PROCEDURE

Standard:	UL 60950-1, 2nd Edition, 2007-03-27 (Information Technology Equipment - Safety - Part 1: General Requirements) CSA C22.2 No. 60950-1-07, 2nd Edition, 2007-03 (Information Technology Equipment - Safety - Part 1: General Requirements)
Certification Type:	Component Recognition
CCN:	QQGQ2, QQGQ8 (Power Supplies for Information Technology Equipment Including Electrical Business Equipment)
Product:	Power supply for building-in, switch mode type
Model:	ECS100USxx-By (where xx can be any number between 12 and 48 designating the output voltage, y can be blank or C). Model with suffix C is provided with cover for Class I only
Rating:	Input: 100-240 Vac, 1.9 A, 50/60 Hz Output: 100W Max output See Enclosure - Miscellaneous Models output rating and differences for details.
Applicant Name and Address:	XP POWER INC SUITE 150 1241 E DYER RD SANTA ANA CA 92705 UNITED STATES

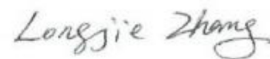
This is to certify that representative samples of the products covered by this Test Report have been investigated in accordance with the above referenced Standards. The products have been found to comply with the requirements covering the category and the products are judged to be eligible for Follow-Up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

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

UL authorizes the applicant to reproduce the latest pages of the referenced Test Report consisting of the first page of the Specific Technical Criteria through to the end of the Conditions of Acceptability.

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

Prepared by: Longjie Zhang
Underwriters Laboratories Inc.
Reviewed by: Lucio Cinelli
Underwriters Laboratories Inc.




Supporting Documentation

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

- A. Authorization - The Authorization page may include additional Factory Identification Code markings.
- B. Generic Inspection Instructions -
 - i. Part AC details important information which may be applicable to products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of this Test Report.
 - ii. Part AE details any requirements which may be applicable to all products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of each Test Report.
 - iii. Part AF details the requirements for the UL Certification Mark which is not controlled by the technical standard used to investigate these products. Products are permitted to bear only the Certification Mark(s) corresponding to the countries for which it is certified, as indicated in each Test Report.

Product Description

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-B 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 is considered Class I use only.

Technical Considerations

- 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 : No
- IT testing, phase-phase voltage (V) : N/A
- Class of equipment : Class I or Class II (Determined by end product)
- Considered current rating (A) : 20

- Pollution degree (PD) : PD 2
- IP protection class : IPX0
- Altitude of operation (m) : Up to 3000
- Altitude of test laboratory (m) : 180
- Mass of equipment (kg) : 341 gram approx.
- The product was submitted and evaluated for use at the maximum ambient temperature (T_{ma}) 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: for building-in
- The product is intended for use on the following power systems: TN
- 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 Aire 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

For use only in or with complete equipment where the acceptability of the combination is determined by Underwriters Laboratories Inc. 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, 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
- 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 3000 m altitude. Additional consideration maybe necessary in the

end-use product.

- The product was submitted and evaluated for use at the maximum ambient temperature (T_{ma}) 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 T_{ma} shall be done in the end production application.

Additional Information

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

Markings and instructions

Clause Title	Marking or Instruction Details
Power rating - Company identification	Listee's or Recognized company's name, Trade Name, Trademark or File Number
Power rating - Model	Model Number
Power rating - Ratings	Ratings (voltage, frequency/dc, current)
Fuses - Non-operator access/soldered-in fuses	Unambiguous reference to service documentation for instructions for replacement of fuses replaceable only by service personnel
Terminals for external primary power supply conductors	Capital letter "N" located adjacent to a terminal intended exclusively for connection of the primary power neutral conductor

Special Instructions to UL Representative

Inspect the transformer(s) listed in BD1.1 per AA1.1- (C). When the tests are conducted at other location, inspect test record and specification sheet provided by the component manufacturer. Verify the specification sheet indicates 100% routine test specified in BD1.1 be conducted at the component manufacturer