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Report Reference #

E146893-V1-S9

## UL TEST REPORT AND PROCEDURE

<b>Standard:</b>	ANSI/AAMI ES 60601-1:2005 (Medical electrical equipment – Part 1: General requirements for basic safety and essential performance) CSA C22.2 No. 60601-1:08 (Medical Electrical Equipment – Part 1: General Requirements for Basic Safety and Essential Performance)
<b>Certification Type:</b>	Component Recognition
<b>CCN:</b>	QQHM2, QQHM8 (Power Supplies, Medical and Dental)
<b>Product:</b>	Switching Power Supply
<b>Model:</b>	AHM150PSXXYY-ZZ (where XX is any number between 12-48 designating output voltage and YY can be blank or "C2", -ZZ can be "-A", "-6", "-6A", "8", "-8A", or blank)
<b>*Rating:</b>	Input Rated: 100-240 Vac, 50/60 Hz, 1.8 A Output Rated: <b>Refer</b> to Model Differences for additional details.
<b>Applicant Name and Address:</b>	XP Power LLC, 15641 Red Hill Ave, Suite 100, Tustin, CA 92780 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 UL LLC (UL) or any authorized licensee of UL.

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### 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

Products covered are external power supplies intended to be used with Medical Electrical Equipment. Units are Class I or Class II.

### Model Differences

All models in the Model AHM150PSXXYY-ZZ Series are identical with exception to the Mains Transformer, T2, and minor secondary components that allow for different output voltage ratings **per the output voltage range noted below**. See below for Model Ratings Table Below for 40°C:

Model AHM150PS12: **10.1-13.5 Vdc, 12.5 A max. (150W max.)**  
Model AHM150PS15: **13.6-17.0 Vdc, 10.0 A max. (150W max.)**  
Model AHM150PS19: **17.1-21.0 Vdc, 7.89 A max. (150W max.)**  
Model AHM150PS24: **21.1-26.0 Vdc, 6.25 A max. (150W max.)**  
**Model AHM150PS28: 26.1-31 Vdc, 5.36 A max. (150W max.)**  
**Model AHM150PS33: 31.1-33 Vdc, 4.55 A max. (150W max.)**  
**Model AHM150PS36: 33.1-42 Vdc, 4.17 A max. (150W max.)**  
Model AHM150PS48: **42.1-54.0 Vdc, 3.13 A max. (150W max.)**

See Enclosure - Miscellaneous for de-rated output values for higher ambient.

Models may have an additional -ZZ identifier which can be "-A", "-6", "-6A", "-8", "-8A", or blank to designate the type of input connector:

blank = C14 style input connector (Class I construction) ;  
"-A" = C14 style input connector with optional IEC cable retention;  
"-6" = C6 style input connector (Class I);  
"-6A" = C6 style input connector with optional IEC cable retention;  
"-8" = C8 style input connector (Class I)  
"-8A" = C8 style input connector with optional IEC cable retention.

Models may have an additional YY identifier which can be blank or "C2". Units designated "C2" have a Class II configuration.

### Technical Considerations

- Classification of installation and use : Transportable
- Supply connection : Appliance coupler
- Accessories and detachable parts included in the evaluation: None
- Options included: None
- The product was investigated to the following additional standards:: ANSI/AAMI **ES60601-1:2005/C1:2009+A1 (2012)** (includes National Differences for USA); CAN/CSA-C22.2 No. 60601-1:08 **+A1 (2014)** (includes National Differences for Canada), EN **60601-1:2006+A1 (2013)**
- 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)
- Scope of Power Supply evaluation excludes the following:
  - Patient applied parts clauses: 4.6, 7.2.10, 8.3, 8.5.2, 8.5.5, 8.7.4.7-8.7.4.9, 8.9.1.15
  - Battery related clauses: 7.3.3, 15.4.3
  - Hand Control related clauses: 8.10.4
  - Oxygen related clauses: 11.2.2
  - Fluids related clauses: 11.6.2 – 11.6.4
  - Sterilization clause: 11.6.7
  - Biocompatibility Clause: 11.7 (ISO 10993)
  - Motor related clauses: 13.2.13.3, 13.4
  - Heating Elements related clause: 13.2
  - Flammable Anaesthetic Mixtures Protection: Annex G
- Supply connection: OVC II
- 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
- Unit also complied with spacing requirements of UL60601-1 (1<sup>st</sup>), CSA C22.2 No. 60601-1 (2<sup>nd</sup>), and IEC 60601-1 (2<sup>nd</sup>) for Basic for 250 Vac from Primary to Ground, Double/Reinforced for 250Vac from

Primary to Secondary, and Supplementary for 250 Vac from Secondary to Earth.

#### **Risk Controls/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 component shall be installed in compliance with the Marking (clause 7) and Separation (clause 8) requirements of the end use application.
- The product was submitted and evaluated for use at the maximum ambient temperature (T<sub>mra</sub>) permitted by the manufacturer's specification of: 40°C output loaded to 100% rated, 60°C output loaded to 60% rated (See De-rating Curve, Enclosure 7-01 for details)
- Repeating leakage current testing should 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 should 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 output connectors are not acceptable for field connections; they are only intended for connection to mating connectors of the end-use machine.
- The Electric Strength Test conducted on this power supply was based upon a maximum working voltage of: Primary-Earthed Dead Metal (Class I units): 432 Vpk, 244 Vrms; Primary-SEC: 432 Vpk, 244 Vrms.
- 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-L5, L7, and T1 are min. Class B (130°C)
- Accompanying documents to be provided as part of the end-product.
- Cleaning test to be considered as part of end product evaluation.
- Marking Durability was conducted, however the need for Marking Durability and Marking Legibility




Testing to be considered as part of the end product installation.

- Power cord suitable for the application to be provided as part of the end product evaluation.

#### Additional Information

Marking label is representative of all models. The nameplate labels included in this report depict the draft artwork for the marking plate pending approval by National Certification Bodies and it will not be affixed to products prior to such approval.

#### 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
Alternating current	
Supply Connection	Voltage range, ac/dc, phases if more than single phase
Direct current	
Power Input	Amps, VA, or Watts
Output	Rated output voltage, power, frequency.
Class II Equipment	
Serial Number or lot or batch identifier	Eight alpha numeric characters (A BB CC DDD where A = factory code; BB = year; CC=week; DDD = serial number)
Date of Manufacturer	Provided as part of the serial number

#### Special Instructions to UL Representative

Class II Equipment marking for Models with additional suffix "C2" only.

#### Production-Line Testing Requirements

**Test Exemptions** - The following models are exempt from the indicated test

Model	Grounding Continuity	Dielectric Voltage Withstand	Patient Circuit Dielectric Voltage Withstand
Model AHM150PSXXYY-ZZ	Exempt	Test	Exempt

**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

#### Sample and Test Specifics for Follow-Up Tests at UL

The following tests shall be conducted in accordance with the Generic Inspection Instructions

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Model	Samples	Test	Test Details
N/A			