UL TEST REPORT AND PROCEDURE

Standard:	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)
Certification Type:	Component Recognition
CCN:	QQHM2, QQHM8 (Power Supplies, Medical and Dental)
Product:	Switching Power Supply
Model:	AHM85PSXXYY-ZZ (where XX is any number between 12-24 designating output voltage and YY can be blank or "C2", -ZZ can be "-A", "-6", "-6A", "8"," -8A", or blank)
***Rating:**	Input Rated: 100-240 Vac, 50/60 Hz, 1.0 A Output Rated: **Refer** Model Differences for additional details.
Applicant Name and Address:	XP POWER **LLC** 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: Melissa DeGuia
UL LLC

*Reviewed by: **Bernadette Matsuoka** **UL LLC**

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 may be either Class I or Class II.

Model Differences

All models in the Model AHM85PSXXYY-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 AHM85PS12: **10.1-13.5** Vdc, 7.08 A **max. (85W max.)**
Model AHM85PS15: **13.6-17.0** Vdc, 5.67 A **max. (85W max.)**
Model AHM85PS19: **17.1-21.0** Vdc, 4.47 A **max. (85W max.)**
Model AHM85PS24: **21.1-26.0** Vdc, 3.54 A **max. (85W max.)**

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

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

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) or C18 input connector (Class II construction);
"-A" = C14 style input connector with optional IEC cable retention;
"-6" = C6 style input connector (Class I or Class II construction);
"-6A" = C6 style input connector with optional IEC cable retention;
"-8" = C8 style input connector (Class I or Class II construction)
"-8A" = C8 style input connector with optional IEC cable retention.

Additional Information:
Models covered under this Report have been additionally evaluated to IEC 60601-1, Edition 3.1 (2012).

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 (21012)** (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) + IEC 60601-1, Edition 3.1 (2012)**
- 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 (1st), CSA C22.2 No. 60601-1 (2nd), and IEC 60601-1 (2nd) 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 (Tmra) 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 as having: One MOPP between Primary to Earth/Reference, Two MOPP between Primary and Secondary, One MOPP from Secondary to Earth/Reference.
- 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): 416 Vpk, 240 Vrms; Primary-SEC: 416 Vpk, 240 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-L4, L6, and T1 are 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.

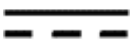
- Power cord suitable for the application to be provided as part of the end product evaluation.

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.
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

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 AHM85PSXX-ZZ	Test	Test	Exempt
Model AHM85PSXXC2-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

Model	Samples	Test	Test Details
N/A			

UL TEST REPORT AND PROCEDURE

Standard:	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)
Certification Type:	Component Recognition
CCN:	QQHM2, QQHM8 (Power Supplies, Medical and Dental)
Product:	Switching Power Supply
Model:	AHM100PSXXYY-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), AHM100PS24 XD0112A
Rating:	Input Rated: 100-240 Vac, 50/60 Hz, 1.2 A Output Rated: See Model Differences for details
Applicant Name and Address:	XP POWER LLC 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 UL LLC ('UL') in accordance with the Follow-Up Service Agreement. Only those products which properly bear the UL Mark are considered as being covered by UL's Follow-Up Service under the indicated Test Procedure.

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

Prepared by: **Melissa DeGuia**
UL LLC

Reviewed by: **Timothy L. Gambrell**
UL LLC

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 may be either Class I or Class II. Double insulated symbol is optionally provided on Class II units. Earthing symbol may only be provided for Class I power supplies.

Model Differences

All models in the AHM100PSXXYY-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 Table below for Model Ratings at 40°C:

Model AHM100PS12: **10.1-13.5** Vdc, 8.33 A **max. (100W max.)**
Model AHM100PS15: **13.5-17.0** Vdc, 6.67 A **max. (100W max.)**
Model AHM100PS19: **17.1-21.0** Vdc, 5.26 A **max. (100W max.)**
Model AHM100PS24: **21.1-26.0** Vdc, 4.16 A **max. (100W max.)**
Model AHM100PS28: 26.1-31 Vdc, 3.57 A max. (100W max.)
Model AHM100PS33: 31.1-33 Vdc, 3.03 A max. (100W max.)
Model AHM100PS36: 33.1-42 Vdc, 2.78 A max. (100W max.)
Model AHM100PS48: **42.1-54.0** Vdc, 2.08 A **max. (100W max.)**

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

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

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) or C18 input connector (Class II construction);
"A" = C14 style input connector with optional IEC cable retention;
"6" = C6 style input connector (Class I or Class II construction);
"6A" = C6 style input connector with optional IEC cable retention;
"8" = C8 style input connector (Class I or Class II construction)
"8A" = C8 style input connector with optional IEC cable retention.

Model AHM100PS24 XD0112A is identical to Model AHM100PS24 with exception to the addition of an alternate input connector.

Technical Considerations

- Classification of installation and use : External 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 (1st), CSA C22.2 No. 60601-1 (2nd), and IEC 60601-1 (2nd) 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 UL LLC. When installed in an end-product, consideration must be given to the following:

- The component shall be provided in compliance with the Marking (clause 7) and Separation (clause 8) requirements of the end use application.

- The power supply was evaluated for use in 40°C ambient at Full Rated Output and 60% of the Rated Output in 60°C ambient. (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 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 medical equipment.

- The Electric Strength Test conducted on this power supply was based upon a maximum working voltage of: Primary-Earthed Dead Metal (Class I units): 430 Vpk, 240 Vrms; Primary-SEC: 430 Vpk, 240 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-L4 are Class B (130°C); T2 is Class B (130°C) or Class F (155°C).

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

- 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.

- The component shall be provided in compliance with the Marking (clause 7) and Separation (clause 8) requirements of the end use application.

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.
Earthing	
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

N/A

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 AHM100PSXXC2-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

Model	Samples	Test	Test Details
N/A			

UL TEST REPORT AND PROCEDURE

Standard:	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)
Certification Type:	Component Recognition
CCN:	QQHM2, QQHM8 (Power Supplies, Medical and Dental)
Product:	Switching Power Supply
Model:	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)
***Rating:**	Input Rated: 100-240 Vac, 50/60 Hz, 1.8 A Output Rated: **Refer** to Model Differences for additional details.

Applicant Name and Address:	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.

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Prepared by: Haydee Gonzalez
UL LLC

Reviewed by: Ahmad Daoudi
UL LLC

Supporting Documentation

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

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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 (1st), CSA C22.2 No. 60601-1 (2nd), and IEC 60601-1 (2nd) 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 (Tmra) 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

Model	Samples	Test	Test Details
N/A			

UL TEST REPORT AND PROCEDURE

Standard:	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)
Certification Type:	Component Recognition
CCN:	QQHM2, QQHM8 (Power Supplies, Medical and Dental)
Product:	Switching Power Supply
Model:	AHM180PSXXYY-ZZ (where XX is any number between 12-48 designating output voltage, where YY can be “C2” or blank, and -ZZ can be "-A", "-6", "-6A", "-8"," -8A", or blank)
*Rating:	Input Rated: 100-240 Vac, 50/60 Hz, 2.2 A Output Rated: Refer to Model Differences for additional details.
Applicant Name and Address:	XP POWER LLC 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: Melissa DeGuia
Underwriters Laboratories Inc.

Reviewed by:

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. Earthing symbol may only be provided for Class I power supplies.

Model Differences

All models in the Model AHM180PSXXYY-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 AHM180PS12: 10.1-13.5 Vdc, 13.75 A max. (180W max.)
Model AHM180PS15: 13.6-17.0 Vdc, 12.0 A max. (180W max.)
Model AHM180PS19: 17.1-21.0 Vdc, 9.47 A max. (180W max.)
Model AHM180PS24: 21.1.-26.0 Vdc, 7.5 A max. (180W max.)
Model AHM180PS28: 26.1-31 Vdc, 6.43 A max. (180W max.)
Model AHM180PS33: 31.1-33 Vdc, 5.45 A max. (180W max.)
Model AHM180PS36: 33.1-42 Vdc, 5.0 A max. (180W max.)
Model AHM180PS48: 42.1-54.0 Vdc, 3.75 A max. (180W 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)
- 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^{st}), CSA C22.2 No. 60601-1 (2^{nd}), and IEC 60601-1 (2^{nd}) 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 (Tmra) 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): 440 Vpk, 240 Vrms; Primary-SEC: 440 Vpk, 240 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 AHM180PSXXYY-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			
Model	Samples	Test	Test Details
N/A			

UL TEST REPORT AND PROCEDURE

Standard:	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)
Certification Type:	Component Recognition
CCN:	QQHM2, QQHM8 (Power Supplies, Medical and Dental)
Product:	Switching Power Supply
Model:	AHM250PSXX-ZZ (where XX is any number between 12-48 designating output voltage, ZZ can be blank, "A", "6", or "6A") **AHM250PSXXT-ZZ**
Rating:	Input Rated: 100-240 Vac, 50/60 Hz, 3 A Output Rated: See Model Differences for details
Applicant Name and Address:	XP POWER LLC 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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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: **Melissa DeGuia**
UL LLC

Reviewed by: **Timothy L. Gambrell**
UL LLC

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. Earthing symbol may only be provided for Class I power supplies.

Model Differences

All models in the Model AHM250PSXX-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 Table below for Model Ratings at 40°C:

Model AHM250PS12: **10.1-13.5** Vdc, 17.5 A **max. (250W max.)**
Model AHM250PS15: **13.6-17.0** Vdc, 16.67 A **max. (250W max.)**
Model AHM250PS19: **17.1-21.0** Vdc, 13.16 A **max. (250W max.)**
Model AHM250PS24: **21.1-26.0** Vdc, 10.41 A **max. (250W max.)**
Model AHM250PS28: 26.1-31 Vdc, 8.93 A max. (250W max.)
Model AHM250PS33: 31.1-33 Vdc, 7.58 A max. (250W max.)
Model AHM250PS36: 33.1-42 Vdc, 6.94 A max. (250W max.)
Model AHM250PS48: **42.1-54** Vdc, 5.21 A **max. (250W max.)**

Model AHM250PSXXT-ZZ is identical to AHM250PSXX-ZZ except for model designation for marketing purposes.

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

Suffix -ZZ when provided denotes the following:

A - Optional Retention Clamp provided
6 - Optional C6 Type appliance inlet provided
6A - Both Optional Retention Clamp and C6 Type appliance inlet provided.

Technical Considerations

- Classification of installation and use : External 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 **+AM1 (2012)** (includes National Differences for USA); CAN/CSA-C22.2 No. 60601-1:08 **+AM1 (2014)** (includes National Differences for Canada), EN 60601-1:2006 **+ AM1 (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)
- 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 (1st), CSA C22.2 No. 60601-1 (2nd), and IEC 60601-1 (2nd) 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 power supply was evaluated for use in 40°C ambient at Full Rated Output and 60% of the Rated Output in 60°C ambient. (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; and One MOPP between Secondary and Earth.
- 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): 430 Vpk, 240 Vrms; Primary-SEC: 591 Vpk, 279 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-L4 and T1 are Class B (130°C).
- Cleaning test to be considered as part of end product evaluation.
- The need for Marking Legibility Testing and repeating the Marking Durability 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.

Earthing	
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 N/A	

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
All Models	Test	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			
Model	Samples	Test	Test Details
N/A			