



Underwriters Laboratories (UL LLC) Safety Certification Body (CB) Report

Model: UCP180PSXX (where XX can be any number 12, 15, 18, 24, 28, 36 or 48 designating the output voltage), may also be provided with additional suffix "-SF" or "-C" or "-T" or "-YYYYYY"

Device Description: Power supply for building-in

Applicant: XP POWER L L C
15641 RED HILL AVE, SUITE 100
TUSTIN CA 92780 UNITED STATES

Manufacturer: Same as Applicant

Manufacturing Facility(ies): Abes Technology Co Ltd
No 78-1 Zhangma St
Xiushui Township
Changhua County 504 TAIWAN

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

XP POWER (VIETNAM) CO LTD
LOT D - 4Q - CN
My Phuoc 3 Industrial Park
Ben Cat District
Binh Duong Binh Duong VIETNAM

Report No.: E321744-D1019-1/A0/C0-CB

Report (Re)Issue Date: 2018-11-20

Base Standard(s): IEC 60601-1 Edition 3.1 (2012), EN 60601-1:2006 + A1:2013 + A12:2014

Additional Standards:

Report Types: This report consists of the following report types:
- CB Report & Certificate

This report covers the Safety evaluation of the referenced model(s) according to the standard(s) specified above.

The **CB Certificate** is provided as a separate enclosure to this report and not provided in the body of this report.

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Report Modifications Summary

The following changes were made to this report. If none listed in the below table, this report is the originally issued report.

The following scheme is used throughout this report to reflect the **Report No.:**

(File No.) – (Report Ref. No.) – (x) / A(y) / C(z) – YYY, where:

(x) = Report (Re)Issue No.

(y) = Amendment No.

(z) = Correction No.

YYY = Report Type (UL/CB/IEC)

*NOTE: The **CB Certificate** may not be updated for report corrections that don't affect the CB Certificate contents; therefore if this report includes a correction number (z), it may not be reflected in the CB Certificate.*



Date Modified (Year-Month-Day)	Modifications Made (include Report Reference Number)	Modified By


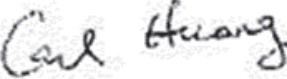


Test Report issued under the responsibility of:



IEC 60601-1 Medical electrical equipment Part 1: General requirements for basic safety and essential performance	
Report Reference No.:	E321744-D1019-1/A0/C0-CB
Date of issue	2018-11-20
Total number of pages	185
CB Testing Laboratory	UL Fremont, 47173 Benicia St., Fremont, CA 94538-7366 USA
Address	
Applicant's name	XP POWER L L C
Address	15641 RED HILL AVE, SUITE 100 TUSTIN CA 92780 UNITED STATES
Test specification:	
Standard	IEC 60601-1:2005 (Third Edition) + CORR. 1:2006 + CORR. 2:2007 + A1:2012 (or IEC 60601-1: 2012 reprint)
Test procedure	CB Scheme
Non-standard test method.....:	N/A
Test Report Form No.....:	IEC60601_1K
Test Report Form Originator	UL(US)
Master TRF	2015-11
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General disclaimer:	
<p>The test results presented in this report relate only to the object tested.</p> <p>This report shall not be reproduced, except in full, without the written approval of the Issuing CB testing laboratory. The authenticity of this Test Report and its contents can be verified by contacting the NCB, responsible for this Test Report.</p>	

Test item description:	Power supply for building-in	
Trade Mark:	Trademark image(s): 	
Manufacturer:	Same as Applicant	
Model/Type reference:	UCP180PSXX (where XX can be any number 12, 15, 18, 24, 28, 36 or 48 designating the output voltage), may also be provided with additional suffix "-SF" or "-C" or "-T" or "-YYYYYY"	
Ratings:	Input: 100-240 Vac, 3 A, 50/60 Hz Output: See Enclosure - Miscellaneous Ratings Table for details.	
Testing procedure and testing location:		
<input type="checkbox"/> CB Testing Laboratory:		
Testing location/ address:		
<input type="checkbox"/> Associated CB Testing Laboratory:		
Testing location/ address:		
Tested by (name, function, signature):		
Approved by (name, function, signature):		
Testing procedure: CTF Stage 1:		
<input type="checkbox"/> Testing procedure: CTF Stage 1:		
Testing location/ address:		
Tested by (name, function, signature):		
Approved by (name, function, signature):		
Testing procedure: CTF Stage 2:		
<input type="checkbox"/> Testing procedure: CTF Stage 2:		
Testing location/ address:		
Tested by (name, function, signature):		
Witnessed by (name, function, signature):		
Approved by (name, function, signature):		
Testing procedure: CTF Stage 3:		
<input checked="" type="checkbox"/> Testing procedure: CTF Stage 3:		
<input type="checkbox"/> Testing procedure: CTF Stage 4:		
Testing location/ address:	XP Power Limited, 401 Commonwealth Drive, Haw Par Technocentre, Lobby B, #02-02, Singapore 149598	
Tested by (name, function, signature):	Chin Chee Siang/Tester	
Witnessed by (name, function, signature):	Not applicable	

Approved by (name, function, signature):	Ben Dahlen / Reviewer	
Supervised by (name, function, signature):	Carl Huang /Project Handler	
<hr/>		

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

Refer to Appendix A of this report. All attachments are included within this report.

Summary of testing

Tests performed (name of test and test clause):

Testing location:

Refer to the Test List in Appendix B of this report if testing was performed as part of this evaluation.

Summary of compliance with National Differences

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

[X] The product fulfils the requirements of IEC 60601-1:2005 (Third Edition) + CORR. 1:2006 + CORR. 2:2007 + A1:2012
(or IEC 60601-1: 2012 reprint).

Copy of marking plate

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBS that own these marks.

Refer to the enclosure(s) titled Marking Label in the Enclosures section in Appendix A of this report for a copy.

GENERAL INFORMATION	
Test item particulars(see also Clause 6):	
Classification of Installation and Use:	For building-in
Device type (component/sub-assembly/ equipment/ system):	Component power supply
Intended use (Including type of patient, application location):	To supply regulated power
Mode of Operation:	Continuous
Supply Connection:	For building-in
Accessories and detachable parts included:	None
Other Options Include:	None
Testing	
Date of receipt of test item(s)	2018-07-02
Dates tests performed	2018-07-02 to 2018-07-26
Possible test case verdicts:	
- test case does not apply to the test object	N/A
- test object does meet the requirement.....	Pass (P)
- test object was not evaluated for the requirement	N/E
- test object does not meet the requirement.....	Fail (F)
Abbreviations used in the report:	
- normal condition: N.C.	- single fault condition: S.F.C.
- means of Operator protection: MOOP	- means of Patient protection: MOPP
General remarks:	
"(See Attachment #)" refers to additional information appended to the report.	
"(See appended table)" refers to a table appended to the report.	
The tests results presented in this report relate only to the object tested.	
This report shall not be reproduced except in full without the written approval of the testing laboratory.	
List of test equipment must be kept on file and available for review.	
Additional test data and/or information provided in the attachments to this report.	
Throughout this report a point is used as the decimal separator.	
Manufacturer's Declaration per sub-clause 4.2.5 of IEC60068-2-12	
The application for obtaining a CB Test Certificate includes more than one factory location and a declaration from the Manufacturer stating that the sample(s) submitted for evaluation is (are) representative of the products from each factory has been provided	Yes
When differences exist; they shall be identified in the General product information section.	

Name and address of factory (ies): Abes Technology Co Ltd
 No 78-1 Zhangma St
 Xiushui Township
 Changhua County 504 TAIWAN

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

XP POWER (VIETNAM) CO LTD
 LOT D - 4Q - CN
 My Phuoc 3 Industrial Park
 Ben Cat District
 Binh Duong Binh Duong VIETNAM

GENERAL PRODUCT INFORMATION:

Report Summary

All applicable tests according to the referenced standard(s) have been carried out.
 Refer to the Report Modifications for any modifications made to this report.

Product Description

The model covered in this report is a component power supply intended for use in Medical 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 UCP180PSXX series are identical with exception to the Mains Transformer, TR1, and minor secondary components that allow for different output voltage ratings.

See below for Model Ratings Table for 50C and 70C ambient with 10 cfm fan applied from input connector CN1 blowing inward:

Model UCP180PS12: Output Rated - convection, no top cover: 12 Vdc 10 A (50C), 12 Vdc, 5 A (70C)
 Model UCP180PS15: Output Rated - convection, no top cover: 15 Vdc, 8 A (50C), 15 Vdc, 4 A (70C)
 Model UCP180PS18: Output Rated - convection, no top cover: 18 Vdc, 6.67 A (50C), 18 Vdc, 3.34 A (70C)
 Model UCP180PS24: Output Rated - convection, no top cover: 24 Vdc, 5 A (50C), 24 Vdc, 2.5 A (70C)
 Model UCP180PS28: Output Rated - convection, no top cover: 28 Vdc, 4.3 A (50C), 28 Vdc, 2.15 A (70C)
 Model UCP180PS36: Output Rated - convection, no top cover: 36 Vdc, 3.33 A (50C), 36 Vdc, 1.67 A (70C)
 Model UCP180PS48: Output Rated - convection, no top cover: 48 Vdc, 2.5 A (50C), 48 Vdc, 1.25 A (70C)

Model UCP180PS12: Output Rated - convection, with top cover: 12 Vdc 9 A (50C), 12 Vdc, 4.5 A (70C)
 Model UCP180PS15: Output Rated - convection, with top cover: 15 Vdc, 7.2 A (50C), 15 Vdc, 3.6 A (70C)
 Model UCP180PS18: Output Rated - convection, with top cover: 18 Vdc, 6 A (50C), 18 Vdc, 3 A (70C)
 Model UCP180PS24: Output Rated - convection, with top cover: 24 Vdc, 4.5 A (50C), 24 Vdc, 2.25 A (70C)
 Model UCP180PS28: Output Rated - convection, with top cover: 28 Vdc, 3.87 A (50C), 28 Vdc, 1.93 A (70C)
 Model UCP180PS36: Output Rated - convection, with top cover: 36 Vdc, 3 A (50C), 36 Vdc, 1.5 A (70C)
 Model UCP180PS48: Output Rated - convection, with top cover: 48 Vdc, 2.25 A (50C), 48 Vdc, 1.13 A (70C)

Model UCP180PS12: Output Rated - forced-air cooling, no top cover: 12 Vdc 15 A (50C), 12 Vdc, 7.5 A

(70C)

Model UCP180PS15: Output Rated - forced-air cooling, no top cover: 15 Vdc, 12 A (50C), 15 Vdc, 6 A (70C)

Model UCP180PS18: Output Rated - forced-air cooling, no top cover: 18 Vdc, 10 A (50C), 18 Vdc, 5 A (70C)

Model UCP180PS24: Output Rated - forced-air cooling, no top cover: 24 Vdc, 7.5 A (50C), 24 Vdc, 3.75 A (70C)

Model UCP180PS28: Output Rated - forced-air cooling, no top cover: 28 Vdc, 6.43 A (50C), 28 Vdc, 3.22 A (70C)

Model UCP180PS36: Output Rated - forced-air cooling, no top cover: 36 Vdc, 5 A (50C), 36 Vdc, 2.5 A (70C)

Model UCP180PS48: Output Rated - forced-air cooling, no top cover: 48 Vdc, 3.75 A (50C), 48 Vdc, 1.88 A (70C)

Model UCP180PS12: Output Rated - forced-air cooling, with top cover: 12 Vdc 13.5 A (50C), 12 Vdc, 6.75 A (70C)

Model UCP180PS15: Output Rated - forced-air cooling, with top cover: 15 Vdc, 10.8 A (50C), 15 Vdc, 5.4 A (70C)

Model UCP180PS18: Output Rated - forced-air cooling, with top cover: 18 Vdc, 9 A (50C), 18 Vdc, 4.5 A (70C)

Model UCP180PS24: Output Rated - forced-air cooling, with top cover: 24 Vdc, 6.75 A (50C), 24 Vdc, 3.37 A (70C)

Model UCP180PS28: Output Rated - forced-air cooling, with top cover: 28 Vdc, 5.78 A (50C), 28 Vdc, 2.89 A (70C)

Model UCP180PS36: Output Rated - forced-air cooling, with top cover: 36 Vdc, 4.5 A (50C), 36 Vdc, 2.25 A (70C)

Model UCP180PS48: Output Rated - forced-air cooling, with top cover: 48 Vdc, 3.37 A (50C), 48 Vdc, 1.69 A (70C)

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

Additional Suffix "-YYYYYY" can be any digits or letters or blank for marketing purpose.

"-C" denotes that unit is provided with option top cover.

"-T" denotes that unit is provided with screw type terminal.

V3 - Units are provided with additional output (V3) to power an external fan.

All "-" considered optional.

See Enclosure for additional ratings information.

Additional Information

The clearance distances have additionally been assessed for suitability up to 5000 m elevation (1.29 correction factor from Table 8 of IEC 60601-1, 3.1 Ed.).

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

The nameplate markings provided are considered representative of the entire series.

The power supply series covered by this report employ 2 Methods of Patient Protection (MOPP) between Primary and Secondary circuits.

The models covered under this Report were additionally evaluated to include IEC 60601-1 Edition 3.1, 2012-08 (for UL report only).

Technical Considerations

- The product was investigated to the following standards:

Main Standard(s):

IEC 60601-1 Edition 3.1 (2012), EN 60601-1:2006 + A1:2013 + A12:2014

From Country Differences:

- Austria: EN 60601-1:2006/A1:2013
- Korea, Republic of: KS C IEC 60601-1
- USA: ANSI/AAMI ES60601-1: A1:2012, C1:2009/(R)2012 and A2:2010/(R)2012
- Canada: CSA CAN/CSA-C22.2 NO. 60601-1:14
- United Kingdom: BS EN 60601:2006 A1
- Sweden: SS-EN 60601-1:2006+A11:2011+A1:2013+AC1:2014+A12:2014

Additional Standards:

- The following additional investigations were conducted: EN 60601-1:2006 + A1:2013 + A12:2014
- The product was not investigated to the following standards or clauses: Biocompatibility (ISO 10993-1), Clause 17 (EMC)
- The following accessories were investigated for use with the product:
- The degree of protection against harmful ingress of water is: Ordinary
The mode of operation is: Continuous
The product is suitable for use in the presence of a flammable anesthetics mixture with air or oxygen or with nitrous oxide: No

Engineering Conditions of Acceptability

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

Considerations to the applied parts requirement, to be conducted as end-product.

The input/output connectors are not acceptable for field connections, they are only intended for factory wiring inside the end-use product.

The component shall be installed in compliance with the enclosure, mounting, marking, spacing, and separation requirements of the end use application.

Power supply provides the following MOPP (means of patient protection): 2 MOPP based upon a working voltage 278 Vrms, 515 Vpk between Primary to Secondary, 1 MOPP based upon a working voltage 250 Vrms, 420 Vpk between Primary and Earth.

Temperature, Leakage Current (including the use of non-frequency weighted device of 8.7.3e), Protective Earthing, Dielectric Voltage Withstand, and Interruption of the Power Supply tests should be considered as part of the end product evaluation.

The product was submitted and tested for use at the manufacturer's recommended ambient temperature (Tmra) of 50C at Full Load and 70C at Half Load.

Magnetic devices TR1 employ a Class B (130C) or higher insulation system.

The PWB is rated 130C.

The end-product evaluation shall ensure that the requirements related to Accompanying Documents, Clause 7.9 are met.

The following input terminals/connectors must be connected to the end-product supply neutral: AC-N CN1. The maximum continuous power supply output relied on forced air cooling from: 10 cfm fan applied from input connector CN1 blowing inward.

For models marked "SF", additional fusing may be required in the end product to meet the requirement of Cl. 8.11.5, Mains fuses and Over Current Release. These products are only provided with a single fuse.

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

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

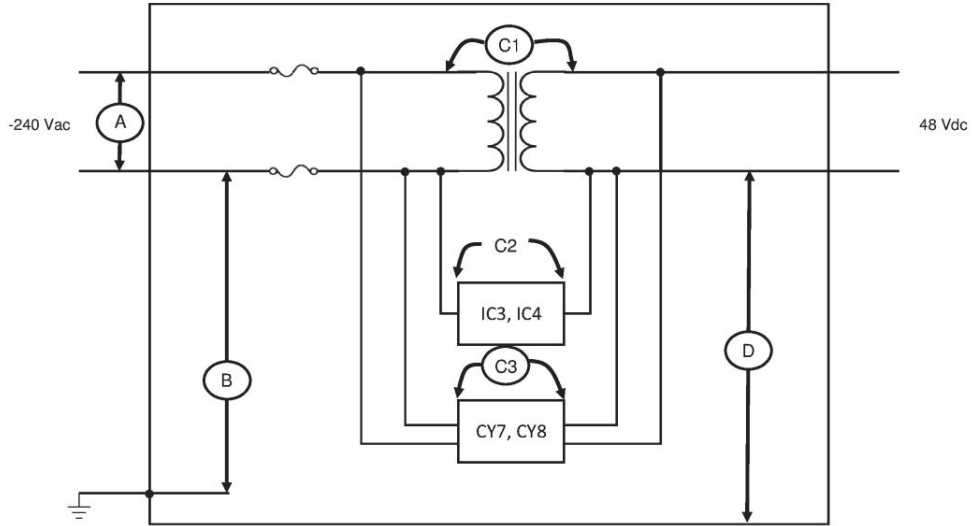
Overcurrent releases of adequate breaking capacity must be employed in the end product.

Report Modifications

Date Modified (Year-Month-Day)	Modifications Made (include Report Reference Number)	Modified By

IEC 60601-1			
Clause	Requirement + Test	Result - Remark	Verdict

Insulation Diagram - (01) UCP180 ISO DIAGRAM 23th Oct



IEC 60601-1			
Clause	Requirement + Test	Result - Remark	Verdict

TABLE: INSULATION DIAGRAM									Pass
Pollution Degree:			2						-
Overvoltage category:			II						-
Altitude:			5000 (m)						-
Additional details on parts considered as applied parts:			[X] None [] Areas: (See Clause 4.6 for details)						-
Area	Number and type of Means of Protection: MOOP, MOPP	CTI	Working Voltage V_{rms}	Working Voltage V_{pk}	Required creepage (mm)	Required clearance (mm)	Measured creepage (mm)	Measured clearance (mm)	Remarks
A	1 MOOP	IIIb	250	420	2.96	2.96	-	-	Across CN1
B	1 MOPP	IIIb	250	420	4	3.3	4.3	3.4	Primary traces to Earthed traces - under CY3
C1	2 MOPP	IIIb	278	515	9.1	9.1	12	12	Vrms: TR1 pin 2 to 12, Vpk: TR1, pin 2 to 9
C2	2 MOPP	IIIb	250	420	8	6.5	8.1	8.1	IC3/IC4
C3	2 MOPP	IIIb	250	420	8	6.5	8.5	8.5	Across CY7 & CY8
D	1 MOPP	IIIb	250	353	4	3.225	4.1	3.5	Across CY9 (Earth) & CN2+

Supplementary Information:

INSULATION DIAGRAM CONVENTIONS and GUIDANCE:

A measured value must be provided in the value columns for the device under evaluation. The symbol > (greater than sign) must not be used. Switch-mode power supplies must be re-evaluated in the device under evaluation therefore N/A must not be used with a generic statement that the component is certified. Insulation diagram is a graphical representation of equipment insulation barriers, protective impedance and protective earthing. If feasible, use the following conventions to generate the diagram:

- All isolation barriers are identified by letters between separate parts of diagram, for example separate transformer windings, optocouplers, wire insulation, creepage and clearance distances.
- Parts connected to earth with large dots are protectively earthed. Other connections to earth are functional
- Applied parts are extended beyond the equipment enclosure and terminated with an arrow.
- Parts accessible to the operator only are extended outside of the enclosure, but are not terminated with an arrow.