

## UL TEST REPORT AND PROCEDURE

<b>Standard:</b>	ANSI/AAMI ES60601-1:2005, 3rd ed. (Medical Electrical Equipment - Part 1: General Requirements for Basic Safety and Essential Performance) CAN/CSA-C22.2 No. 60601-1 (2008) (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>	Power Supply
<b>Model:</b>	MINT1175AXXYKZZ, MINT1175BXXYYKZZ, Where XX represents the output voltage which may be any number from 12 to 56, YY represents output connector which may be any two alphanumeric digits, and ZZ represents non-safety related customer options and RoHS statements which may be any two alphanumeric digits.
<b>Rating:</b>	Input: 100-240V~, 50-60Hz, 3.0A  Output: With 200 LFM (linear feet per minute) forced air flow: Main Output: 12Vdc/14.6A to 56Vdc/3.13A, Maximum 175W, Fan Output: 12Vdc/0.4A  Without forced air flow: Main Output: 12Vdc/10A to 56Vdc/2.15A, Maximum 120W, Fan Output: 12Vdc/0.4A
<b>Applicant Name and Address:</b>	SL POWER ELECTRONICS CORP BLDG A 6050 KING ST VENTURA CA 93003 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.

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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Reviewed by: Richard Dolle

**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 MINT1175AWWXXYZZ series (Class I type), and MINT1175BWWXXYZZ series (Class II type) are open-frame AC/DC power supplies, designed for building-in to an end-product used in a hospital or related health care facility environment.

The power supplies output can be maximum 262 W with 175 LFM (linear feet per minute) forced air flow, or de-rated to maximum of 120 W without forced air flow.

**Model Differences**

The MINT1175AWWXXYZZ series is Class I type; MINT1175BWWXXYZZ series is Class II type.

Class I construction installs a metal pillar for connecting to protective earth, which Class II construction does not have. Class I construction installs a pair of 1500pF capacitors (C115, C116) from Mains lines to protective earth, which Class II construction does not have.

All Models are identical in circuit with exception to the Mains Transformer T200 and minor secondary components that allow for different output voltage ratings. There are four types of Mains Transformer T300 in the series of power supplies, difference is number of turns on secondary winding N3, N4. Refer to Enclosure 4-06, 4-07.

**Technical Considerations**

- 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 to end products.
- Mode of operation : Continuous
- Supply connection : Build-in
- Accessories and detachable parts included : None
- Other options include : None
- The product was not investigated to the following standards or clauses:: Scope of Power Supply evaluation defers the following clauses to the be determined as part of the end product: Clause 4.2 (Risk Management), Clause 7.5 (Safety Signs), Clause 7.9 (Accompanying Documents), Clause 9 (ME Hazard), Clause 10 (Radiation), Clause 14 (PEMS), Clause 16 (ME Systems).
- The degree of protection against harmful ingress of water is:: IPX0 (All models).
- 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

- Software is relied upon for meeting safety requirements related to mechanical, fire and shock: No
- Manufacturer's Recommended Ambient: 50°C
- The product is Classified only to the following hazards: Casualty, Fire, Shock
- Power Supply was considered Overvoltage Category II (OVCI)

### **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:

- Products install fuses on both line and neutral lines with breaking capacity of minimum 40A. In the end-use application, the power source, which the products connect to, has to be reviewed for the available short circuit current.
- The products were tested on a 20A branch circuit, if use on a branch circuit greater than 20A, additional tests may be necessary.
- The component shall be installed in compliance with the Marking (clause 7) and Separation (clause 8) 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.
- Transformer T200 provided with a Class F (155°) insulation system. Transformer T400 provided with a Class B (130°) insulation system.
- The end product should ensure that the requirements related to accompanying documents, clause 7.9, are met.
- This power supply has been evaluated as continuous operation, ordinary equipment and has not been evaluated for use in the presence of a flammable anaesthetic mixture with air, oxygen, or nitrous oxide. The output circuits have not been evaluated for direct patient connection (Type B, BF or CF).
- The available voltage for the secondary outputs does not exceed 25 Vac or 60 Vdc, under normal and single fault conditions.
- End product Risk Management Process to include consideration of requirements specific to the

Power Supply.

- End product Risk Management Process to consider the acceptability of risk for the following components that were identified as High-Integrity Components: Fuses (F100, F101), Optocouplers (U201, U202, U601, U603, U501).
- Single fault testing was conducted without dielectric breakdown, however end product Risk Management Process to consider the need for simultaneous fault condition testing.
- End product Risk Management Process to consider the need for different orientations of installation during testing.
- Humidity testing was conducted, however the end product Risk Management Process to determine risk acceptability criteria.
- Temperature Test was conducted without Test Corner. End product to determine the acceptability of risk with respect to insulation's resistance to heat, moisture, and dielectric strength per 8.8.4.
- End product to determine the acceptability of risk in conjunction to the selection of components as it pertains to the intended use, essential performance, transport, storage conditions as part of the power supply.
- Leakage current testing should be considered in the end product application.
- The expected service life of this product is 5 years.
- Models MINT1175BXXYKZZ are Class II products, the need for IEC symbol 60417-5172 should be considered in the end use product.
- For Class I configuration, Two MOPP is provided between primary and secondary; One MOPP is provided between primary and earth (chassis), operational insulation provided between secondary and earth.
- For Class II configuration, Two MOPP is provided between primary and secondary.
- 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.
- Limitation of Voltage/Energy test (8.4.3) was not conducted and should be considered in the end product evaluation.
- Input/output connectors are suitable for factory wiring only.

**Additional Information**

The schematics for these models are kept in file at the CB Testing Laboratory mentioned in the first page of this test report, and can be provided by the manufacturer upon request by NCB's/CBTL's.


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

The Electrical and Nameplate Labels are representative of all models in the series.

**Additional Standards**

The product fulfills the requirements of: The product fulfills the requirements of: ANSI/AAMI ES60601-1 (2005 + C1:09 + A2:10) (Medical Electrical Equipment - Part 1: General Requirements for Basic Safety and Essential Performance) (includes Deviations for United States); CAN/CSA-C22.2 No. 60601-1 (2008) (Medical Electrical Equipment - Part 1: General Requirements for Basic Safety and Essential Performance) (includes National Differences for Canada); EN 60601-1:2006 Medical electrical equipment - Part 1: General requirements for basic safety and essential performance.

**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	
Power Input	Amps, VA, or Watts
Fuses	Ratings (current and voltage) and type. (located adjacent to fuse OR as a diagram inside enclosure)
Class II Mark	Only for Class II type models.

**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
MINT1175BXXYYKZZ	Yes	No	N/A

**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:

Component
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

Plastic Enclosure or Part	Test	Sample(s)	Test Specifics
N/A			