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Inspections at your plant will be conducted by the Inspection Center in your vicinity. More information on Follow-up Service Inspections can be found at <https://www.ul.com/resources/follow-up-services-additional-resources>.

Please note, Follow-Up Procedure Revisions or Report Revisions do not include Authorization Pages, Indices, Section General, and/or Appendices unless revisions were required or requested.

Should you have any questions, after reviewing the material, or need to report any inaccuracies, please reach out to your UL representative or find UL contact details for your local Customer Service Department at <https://www.ul.com/about/locations>.

Please find attached the related material on Project 4789961844

For your convenience, the below describes the related updates:

For revised/new documentation, please reference 2021-09-30 in the page headings

E158873-volX14-Index
E158873-volX14-GII
E158873-A6085-DescriptionUL
Figure-9-Total

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File		Volume	Page	Date:
E158873	Index	X14	1	30-Sep-21

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<u>Product Type</u>	<u>Model/Type Reference</u>	<u>Report Reference #</u>	<u>Status</u>
Audio Server	SPA-S1000	E158873-A6085-UL	

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GENERIC INSPECTION INSTRUCTIONS

Product Category	Listing / Classification CCN	Component Recognition CCN **
Audio Video, Information and Communication Technology Equipment	AZOT, AZOT7	AZOT2, AZOT8
Power Supplies for Audio Video, Information and Communication Technology Equipment	QQJQ, QQJQ7	QQJQ2, QQJQ8
Information Technology Equipment Including Electrical Business Equipment	NWGQ, NWGQ7	NWGQ2, NWGQ8
Power Supplies for Information Technology Equipment Including Electrical Business Equipment	QQGQ, QQGQ7	QQGQ2, QQGQ8

** These instructions shall also be used for the indicated Component Recognition CCNs unless specifically exempted from the factory production-line tests as noted in each individual Test Report.

These instructions contain the UL LLC Follow-Up inspection requirements for manufacturing and production-line tests. These requirements are considered to be certification requirements related to Follow-Up inspection of equipment, as such, they are not included in the Bi-National Standard as deviations from IEC 60950 or IEC 60950-1.

These instructions consist of the following Parts:

Part	Description
AA	Instructions and Duties for UL Representative
AB	Instructions for Follow-Up Tests at UL
AC	Responsibilities and Requirements for Manufacturer
AD	General Terminology
AE	General Product Construction Requirements
AF	UL Certification Marks

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PART AA

INSTRUCTIONS AND DUTIES FOR UL REPRESENTATIVE

AA1.0	UL REPRESENTATIVE'S DUTIES
AA1.1	<p>The UL Representative's duties include, but are not limited to:</p> <ul style="list-style-type: none"> A. Examining the construction of production intended to bear the UL Mark or Marking to determine compliance with the description of the product and any other requirements expressed in this Procedure. B. Where so specified in each Test Report, forwarding samples to UL for Follow-Up tests C. Where so specified by Part AC, inspecting the test records and facilities of the manufacturer to ensure that: <ul style="list-style-type: none"> 1. The proper number of samples are undergoing the required tests, and 2. The required tests are being performed correctly, and 3. The proper information is being recorded and is up-to-date, and 4. The instruments being used for the tests have been calibrated at the prescribed interval and are in good working order.
AA2.0	PROCEDURE IN CASE OF NONCONFORMANCE
AA2.1	<p>Report to the manufacturer and UL LLC by means of a Variation Notice (VN) if:</p> <ul style="list-style-type: none"> A. Variations in construction are found, or B. The manufacturer's method and/or frequency of testing is not as described, or C. The test records maintained by the manufacturer are not as described, or D. The manufacturer's inspection program is not being performed as described, or E. Nonconforming test results are witnessed during tests conducted specifically for the UL Representative.
AA2.2	<p>Explain to the manufacturer that a VN is a means of communication with the manufacturer and applicant and forms a record of those items where nonconformance to the Procedure has been found. Reference is to be made to "Information for Manufacturer's Variation Notices" on the back of the VN.</p>
AA2.3	<p>When a product does not conform with the Procedure, require that the manufacturer:</p> <ul style="list-style-type: none"> A. Remove any markings referencing UL from the product, or B. Suitably modify all products that do not comply with the Procedure, or C. Hold shipment pending further instructions from UL LLC <p>Exception: Production may be temporarily accepted if it can be determined that the nonconformance does not present a conflict with the applicable UL requirements, and laboratory testing (other than Follow-Up testing) is not required to determine product compliance.</p>

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AA2.4	In the event of a disagreement between the manufacturer and the UL Representative as to whether a product is acceptable, the manufacturer shall hold production at the factory pending resolution of the variations. The manufacturer and applicant have the right to appeal the decision; and the UL Representative shall provide the name of the UL Engineer to whom the appeal is to be made. If the UL Engineer is not known the manufacturer is to be directed to contact the Client Advisor at the Reviewing Office. Should UL LLC grant temporary authorization for the continued use of the UL Mark, such temporary authorization shall only be for the time needed to review and/or process the Procedure revisions, or as otherwise specified to cover a particular lot or production run.
AA3.0	INSTRUCTIONS FOR INSPECTION OF THE PRODUCT
AA3.1	At each inspection, samples of current production and/or stock shall be examined for compliance with the applicable descriptions and requirements contained in this Procedure.
AA4.0	INSTRUCTIONS FOR SAMPLE SELECTION
AA4.1	Certain products contained in this Procedure employ plastic enclosures that may require Follow-Up testing when the material is not a Recognized Component Plastic (QMFZ2). Where indicated in each Test Report, samples shall be selected once per year.
AA4.2	Where Follow-Up tests are required, the number and type of samples to be selected and the tests to be conducted are indicated in each Test Report. Where different models shown use identical enclosures (material and dimensions), a single enclosure can be sent to represent all models. When several alternate materials are specified for particular models, only a sample of the enclosure material currently in use should be sent.
AA4.3	The selected samples shall be appropriately tagged to indicate materials, manufacturer and model/cat. no., and shall be forwarded to the appropriate Reviewing Office. Each enclosure sample should also be marked with the Procedure and Report Reference Number that the sample represents.

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PART AB

INSTRUCTIONS FOR FOLLOW-UP TESTS AT UL

AB1.0	GENERAL
AB1.1	A Test Report may require Follow-Up Tests for specific products. The stated sample requirements and test specifics are based the information in AB2.0.
AB1.1	The samples forwarded by the UL Representative shall be subjected to the specified tests in accordance with the method and basis of acceptability noted in AB3.0.
AB1.2	All clause references are from the Standard for Safety of Information Technology Equipment, UL 60950, Third Edition and UL 60950-1, First Edition.

AB2.0	SAMPLE REQUIREMENTS		
	Test	Samples	Test Specifics
AB2.1	Impact	1 complete unit or 1 enclosure with supporting framework	Ball drop height = 1.3 m
AB2.2	Drop	1 complete unit	Unit drop height = 0.75 m or 1 m
AB2.3	Stress Relief	1 complete unit; or 1 enclosure with supporting framework	Oven temperature (°C)
AB2.4	3/4-Inch (19 mm) Flammability	3 enclosures or 3 sample parts with representative wall thickness and ventilation openings.	Oven temperature (°C)
AB2.5	5-Inch (127 mm) Flammability	3 enclosures or 3 sample parts with representative wall thickness and ventilation openings.	Oven temperature (°C)
AB2.6	Needle-Flame	3 enclosures or 3 sample parts with representative wall thickness and ventilation openings.	Oven temperature (°C)

AB3.0	PERFORMANCE TESTS		
	Test	Method (sub-clause)	Basis for Acceptability
AB3.1	Impact	4.2.5	4.2.1
AB3.2	Drop	4.2.6	4.2.1
AB3.3	Stress Relief	4.2.7	4.2.1
AB3.4	3/4-Inch (19 mm) Flammability	Annex A, A.2	Annex A, A.2
AB3.5	5-Inch (127 mm) Flammability	Annex A, A.1	Annex A, A.1
AB3.6	Needle-Flame	Annex A, A.2.7	Annex A, A.2.7

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PART AC

RESPONSIBILITIES AND REQUIREMENTS FOR MANUFACTURER

AC1.0	MANUFACTURER'S RESPONSIBILITIES (INCLUDING BUT NOT LIMITED TO)
AC1.1	Control of UL Mark - Restrict the use of markings that reference UL (either directly or by use of the name, an abbreviation of it, or the UL symbol or Classification Mark, or indirectly by means of agreed-upon markings that are understood to indicate acceptance by UL) to those products that are found by the manufacturer's own inspection to comply with the Procedure description. Such restrictions apply to packaging, brochures or other means of advertising that reference UL. Use of such markings is further limited by the agreements that have been executed by the subscriber and UL.
AC1.2	Substitution of Non-Specified Plastic Materials - The product description may require the use of a Recognized Plastic with a minimum flammability rating. For these cases, before a plastic material may be used, current UL certification documentation must be checked to ensure that the plastic material has an acceptable flammability rating as specified at the thickness of use. Acceptable UL certification documentation includes: (a) the current edition of the Recognized Component Directory or Supplement; (b) the UL Online Certification Directory (http://www.ul.com/database). NOTE: The above does not apply to materials for which the specific manufacturer and type designation of the plastic is specified in the individual Test Reports (i.e. Enclosures).
AC1.3	Substitution of Non-Specified PWB's - Before a printed wiring board may be used, current UL certification documentation must be checked to ensure that the maximum solder temperature and dwell time is as indicated and that the printed wiring board has minimum flammability and operating temperature ratings as specified in the individual Test Reports or other specified requirements. Acceptable UL certification documentation includes: (a) the current edition of the Recognized Component Directory or Supplement; (b) the UL Online Certification Directory (http://www.ul.com/database).
AC1.4	Production-Line Tests - Conduct the tests detailed in Part AC2.
AC1.5	Test Equipment Calibration – Determine that the test equipment is functioning properly and have it calibrated at least annually, or whenever it has been subject to abuse (such as being dropped or struck with an object) or its accuracy is questionable. Calibration may be by the manufacturer or an outside laboratory. In either case, it shall be by comparison with a Standard that is traceable to the applicable U.S. or the appropriate country's National Standard. Certification of calibration shall be maintained by the manufacturer until the next succeeding certification, and shall be readily available for review by the UL Representative. A letter from an outside laboratory or from an off-site manufacturer's calibration lab stating that their lab Standards are directly traceable to their country's National Standard and outlining their traceability path is considered adequate proof of traceability. A tag or marking on the equipment alone is not to be considered as equivalent to certification, but may be used to reference the certification report.
AC1.6	Packaging - Ensure that there are no markings on the carton, package or contents that are, or could be construed to be, in conflict with or an extension of the uses covered in the instruction manual or Procedure.

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AC1.7	<p>Power Supply Cords –</p> <p>A. Non-Detachable Power Supply Cord - A non-detachable power supply cord must be provided if described in a Test Report.</p> <p>B. Detachable Power Supply Cord - A detachable power supply cord described in a Test Report may or may not be shipped with the unit(s). When a cord is provided, it should either:</p> <ol style="list-style-type: none"> 1. Comply with the specific description in the Procedure, or, 2. Be provided for products for use outside of the USA and/or Canada. In this case, the manufacturer is to supply the UL Representative with information that allows the Representative to verify that the products are intended to be sold outside of the USA and/or Canada <u>and</u> that the cord is certified or similarly appropriate for use in the destination country.
AC1.8	<p>User and Installation (Safety) Instructions provided with Bulk Shipped Equipment</p>
AC1.8.1	<p>Bulk shipments may be provided with installation instruction sets totaling less than the total number of products in the shipment provided, or none at all provided that the following conditions are met.</p> <p>A. Bulk Shipment to Distribution Center - Bulk shipments from a manufacturing facility covered by the Procedure describing the product to an off-site distribution center need not have the user/installation instructions provided with the shipment if appropriate safety instructions will be added to individual products at the distribution center before final redistribution to the consumer. It is the dual responsibility of the manufacturer and distribution center to have a system in place to insure that all instructions required by the Procedure are provided with the product before final distribution to the consumer, but this system will not be subject to review by UL Follow-Up Service.</p> <p>Example: A product shipped in a bulk lot to an overseas distribution center where appropriate installation instructions in the local language are added before final redistribution.</p> <p>B. Bulk Shipment to Single Destination Which Controls Installation of Equipment and Manages Distribution of Instructions - Bulk shipments from a manufacturing facility covered by the Procedure to a single destination, where the redistribution and installation of the product, including distribution of instructions, is under the control of the customer, may include just one set of use/installation instructions provided that the user/installation instructions (original or copies) are made available to the users of the equipment, as needed.</p> <p>Alternatively, user/installation instructions need not be provided with such a shipment if appropriate safety instructions will be sent separately to single destination that controls installation of the equipment. For such cases, it is the responsibility of the manufacturer to have a system in place to insure that all instructions required by the Procedure are provided to the consumer, but this system will not be subject to UL Follow-Up Service.</p> <p>Example: A product shipped in bulk lots to a corporate customer where the equipment will be redistributed and installed locally by the corporate customer, and copies of user/installation instructions are not needed for all users of the equipment.</p> <p>C. Bulk Shipment to Single Destination Which Does Not Control Installation - Bulk shipments from a manufacturing facility covered by the Procedure describing the product to a single destination, where redistribution and installation of the product is not controlled, should be provided with individual sets of use/installation instructions for each product, unless subjected to special consideration.</p> <p>Example: A product shipped in bulk lots to a wholesale or retail outlet where the installation of the equipment will not be under the control of the wholesaler or retailer.</p>

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AC1.8.2	Compliance with these guidelines will be determined through a review of the content of the equipment's installation instructions during the product investigation, and information supplied to the UL Inspection Center Representative during inspection visits. Other options that provide an equivalent level of safety or control may be considered based on the application.
AC1.9	<p>Product Variations - In the event that a nonconformance to the Procedure is found, a Variation Notice (VN) will be issued. A VN is a means of communication with the applicant and manufacturer, and forms a record of those items where nonconformance to the Procedure has been found. The VN will indicate the specific model inspected and all other models with similar construction features, even when these models are not individually inspected.</p> <p>Unless directed otherwise by the UL Representative, when a product does not comply with the Procedure, the manufacturer shall either:</p> <ul style="list-style-type: none"> A. Remove any markings referencing UL from the product, packaging, instructions, etc.; or B. Suitably modify all products that do not comply with the Procedure; or C. Hold shipment pending further instructions from UL LLC; or D. Act in accordance with special arrangements made with the Reviewing Office.
AC1.9.1	In the event of a disagreement between the manufacturer and the UL Representative as to whether or not a product is conforming, the manufacturer shall hold production at the factory pending resolution of the variations. The applicant or manufacturer has the right to appeal a decision with which he disagrees and should contact the appropriate UL Office to resolve any disagreements. Should UL LLC grant temporary authorization for the continued use of the UL Mark, such temporary authorization shall only be for the time needed to review and/or process the Procedure revisions, or as otherwise specified to cover a particular lot or production run.

AC2.0	REQUIREMENTS FOR PRODUCTION-LINE TESTS
AC2.1	The following Production-Line Tests shall be conducted on the products covered by this Procedure. During production, the test equipment shall be checked for proper operation at least once during each shift. When the tests are not performed concurrently, it is preferred that the Electric Strength (Dielectric Voltage-Withstand) Test be performed after the Earthing (Grounding) Continuity Test.
AC2.2	Production-Line Earthing (Grounding) Continuity Test
AC2.2.1	General
AC2.2.1.1	<p>For Listed products: Except as may be noted under "Exceptions" in each Test Report, the manufacturer shall subject 100 percent of production of all of the following products to a routine Production-Line Earthing Continuity Test as described in section AC2.2.3.</p> <ul style="list-style-type: none"> A. Products that are provided with a non-detachable earthing type power supply cord, or B. Products that are provided with an earthed type inlet which accepts a detachable power supply cord, or C. Products that are provided with an earthing type terminal block or field wiring (pigtail leads) for permanent connection to the branch circuit.
AC2.2.1.2	For Component Recognized products: When specifically noted in each Test Report, the manufacturer shall subject 100 percent of the specified models to a routine Production-Line Earthing Continuity Test as described in section AC2.2.3.
AC2.2.2	Test Equipment
AC2.2.2.1	Any suitable continuity-indicating device (such as an ohmmeter, a battery and buzzer combination, or the like) may be used to determine compliance with the Earthing Continuity Test requirements. Commercial earth continuity testers that pass a current through the earthing path may also be used to determine compliance with the same requirements.

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AC2.2.3	Method
AC2.2.3.1	Continuity shall be determined between the earthing conductor of the attachment plug cap, and/or the designated main protective earthing point, and accessible dead-metal parts of the product, using the test equipment indicated above.
AC2.2.3.2	A single test is sufficient if the accessible metal selected is conductively connected by design to all other accessible metal.
AC2.2.4	Basis for Acceptability
AC2.2.4.1	There shall be earthing continuity between the parts specified.
AC2.2.5	In Cases of Non-conformance
AC2.2.5.1	Any unit that does not conform shall be segregated from conforming units until repaired or otherwise brought into compliance. Records of non-conforming test results shall be retained for six (6) months and shall be readily available for review by the UL Representative. The records shall include the model or catalog designation of the product, the date of production of the unit, the date the test was performed, test results and action taken on rejection.
AC2.3	Production-Line Electric Strength (Dielectric Voltage-Withstand) Test
AC2.3.1	General
AC2.3.1.1	For Listed products: Except as may be noted under "Exceptions" in each Test Report, the manufacturer shall subject 100 percent of production of all products to a routine Production-Line Electric Strength Test as described in section AC2.3.3.
AC2.3.1.2	For Component Recognized products: When specifically noted in each Test Report, the manufacturer shall subject 100 percent of the specified models to a routine Production-Line Electric Strength Test as described in section AC2.3.3.
AC2.3.2	Test Equipment
AC2.3.2.1	The test equipment shall include a means of indicating the test potential, an audible or visual indicator of electrical breakdown, and either a manually operated reset device to restore the equipment after electrical breakdown or an automatic feature that rejects any unacceptable unit. If an ac test potential is applied, the test equipment shall also include a transformer having an essentially sinusoidal output.
AC2.3.2.2	If the output of the test-equipment transformer is less than 500 volt-amperes, the equipment shall include a voltmeter in the output circuit to indicate the test potential directly.
AC2.3.2.3	If the output of the test-equipment transformer is 500 volt-amperes or more, the test potential may be indicated (1) by a voltmeter in the primary circuit or in a tertiary-winding circuit, (2) by a selector switch marked to indicate the test potential, or (3), in the case of equipment having a single test-potential output, by a marking in a readily visible location to indicate the test potential. When marking is used without an indicating voltmeter, the equipment shall include a positive means, such as an indicator lamp, to indicate that the manually operated reset switch has been reset following a dielectric breakdown.
AC2.3.2.4	Test equipment other than that described above may be used when it can be shown that UL has previously confirmed in writing that the equipment complies with the above requirements and is deemed suitable for use for this test.

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AC2.3.3	Method
AC2.3.3.1	<p>Each product shall withstand without electrical breakdown, as a routine production-line test, the application of an ac potential at a frequency within the range of 40-70 Hz or a dc potential between (a) the primary wiring, including connected components, and (b) accessible dead metal parts that are likely to become energized.</p> <p>For purposes of these instructions, primary wiring encompasses input wiring for connection to power systems associated with both ac mains and dc mains that exceeds 60 V dc.</p> <p>Note: See the Specific Inspection Criteria in each Test Report for details or special instructions for test locations, such as testing of enamel coating on signal transformers associated with TNV circuits per 2.3.2 and 6.2.1 of UL 60950/-1.</p>
AC2.3.3.2	When there are capacitors across the insulation under test, it is recommended that dc test voltages be used.
AC2.3.3.3	The production-line test potential for paragraph AC2.3.3.1 shall be in accordance with Table AC1 for protectively earthed (Class I) products and Table AC2 for double insulated (Class II) products, as applicable. The full test potential is to be applied for 1 second. The manufacturer's test conditions may be higher than those shown in Tables AC1 and AC2 when necessary to comply with other international product safety certifications.
AC2.3.3.4	The product may be in a heated or unheated condition for the test.
AC2.3.3.5	<p>The test shall be conducted when the product is complete (fully assembled), and it is not intended that the product be unwired, modified, or disassembled for the test, unless otherwise permitted below:</p> <p>A. A part, such as a snap cover or a friction-fit knob, that would interfere with conducting the test need not be in place.</p> <p>B. The test may be conducted before final assembly if the test parameters represent that for the completed product.</p> <p>C. The test need not be performed using the power supply cord provided with the product. However, if the manufacturer's test method employs a test power supply cord, then the continuity of the test power supply cord conductive connections shall be checked once daily.</p>
AC2.3.3.6	For the test, either a sufficient number of control devices are to be closed, or separate applications of the test potential are to be made, so that all parts of the primary circuit are tested.
AC2.3.3.7	<p>During the test, the primary switch is to be in the on position, both sides of the primary circuit of the product are to be connected together and to one terminal of the test equipment, and the second test-equipment terminal is to be connected to accessible dead metal, except as permitted below:</p> <p>A. A product (resistive, high-impedance winding, or the like) having circuitry not subject to excessive secondary voltage buildup in case of electrical breakdown during the test may be tested (1) with a single-pole primary switch, if used, in the off position, or (2) with only one side of the primary circuit connected to the test equipment when the primary switch is in the on position or when a primary switch is not used.</p> <p>B. The primary switch is not required to be in the on position if the testing means applies full test potential between the primary wiring and dead metal parts with the switch not in the on position.</p>
AC2.3.3.8	When authorized by the "Exceptions" included in each Test Report, solid-state components that might be damaged by a secondary effect (induced voltage surge, excessive heating, and the like) of the test may be short-circuited by means of a temporary electrical jumper or the test may be conducted without the component electrically connected, providing the wiring and terminal spacings are maintained. Transient voltage suppression devices other than capacitors connected from primary wiring to dead metal may also be disconnected during the test.

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AC2.3.4	Basis for Acceptability
AC2.3.4.1	All products shall withstand the applied potential without an indication of electrical breakdown.
AC2.3.5	In Cases of Non-conformance
AC2.3.5.1	Any unit that does not conform when tested at the values as specified in Table AC1 or AC2 shall be segregated from conforming units until repaired or otherwise brought into compliance. Records of non-conforming test results shall be retained for six (6) months and shall be readily available for review by the UL Representative. The records shall include the model or catalog designation of the product, the date of production of the unit, the date the test was performed, test results and action taken on rejection.

TABLE AC1
ELECTRIC STRENGTH TEST CONDITIONS
FOR CLASS I (PROTECTIVELY EARTHED) EQUIPMENT

Appliance Voltage Rating	Test Potential (V rms)	Test Potential (V dc)	Time (seconds)
Rated less than or equal to 130 V rms (184 V dc)	1000	1400	1
Rated more than 130 V rms (184 V dc) and less than or equal to 600 V rms (849 V dc)	1500	2100	1

For products with special constructions and test conditions see "Exceptions" in each Test Report.

TABLE AC2
ELECTRIC STRENGTH TEST CONDITIONS
FOR CLASS II (DOUBLE INSULATED) EQUIPMENT

Appliance Voltage Rating	Test Potential (V rms)	Test Potential (V dc)	Time (seconds)
Rated less than or equal to 130 V rms (184 V dc)	2000	2800	1
Rated more than 130 V rms (184 V dc) and less than or equal to 600 V rms (849 V dc)	3000	4200	1

For products with special constructions and test conditions see "Exceptions" in each Test Report.

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PART AD

GENERAL TERMINOLOGY

AD1.0	ABBREVIATIONS / DEFINITIONS	
AD1.1	Bounding Surface	The outer surface of the electrical enclosure, considered as though metal foil was pressed into contact with accessible surfaces of insulating material
AD1.2	Clearance	Shortest distance between two conductive parts or between a conductive part and the BOUNDING SURFACE of the equipment, measured through air
AD1.3	Creepage Distance	Shortest distance between two conductive parts, or between a conductive part and the BOUNDING SURFACE of the equipment, measured along the surface of the insulation
AD1.4	Extra Low Voltage (ELV)	A secondary circuit with voltages between any two conductors of the circuit, and between any one such conductor and earth, not exceeding 42.4 V peak, or 60 V dc, under normal operating conditions, which is separated from a HAZARDOUS VOLTAGE CIRCUIT by basic insulation, and which neither meets all of the requirements for an SELV circuit nor meets all of the requirements for a LIMITED CURRENT CIRCUIT.
AD1.5	Hazardous Energy Level (HAZ/EL)	An available power level of 240 VA or more having a duration of 60 s or more, or a stored energy level of 20 J or more, at a potential of 2 V or more.
AD1.6	Hazardous Voltage (HAZ/V)	A voltage exceeding 42.4 V peak, or 60 V dc, existing in a circuit that does not meet the requirements for either a LIMITED CURRENT CIRCUIT or a TNV CIRCUIT.
AD1.7	Limited Current Circuit (LCC)	A circuit which is so designed and protected, that, under both normal operating conditions and single fault conditions, the current which can be drawn is not hazardous
AD1.8	Limited Power Source (LPS)	A circuit which includes a transformer or battery, and which is either inherently limited to power levels considered not a risk of fire, or is not inherently limited and requires an over-current protective device to limit the source to power levels considered not a risk of fire
AD1.9	Primary (PRI)	A circuit that is directly connected to the ac mains supply. It includes, for example, the means for connection to the ac mains supply, the primary windings of transformers, motors and other loading devices.
AD1.10	Safety Extra Low Voltage (SELV)	A SECONDARY CIRCUIT which is so designated and protected that under normal operating conditions and single fault conditions, its' voltages do not exceed a safe value, generally 42.2 V peak or 60 V dc.
AD1.11	Secondary (SEC)	A circuit that has no direct connection to a PRIMARY CIRCUIT and derives its power from a transformer, converter or equivalent isolation device, or from a battery.
AD1.12	TNV Circuit	A telecommunications network voltage circuit, which is in the equipment and to which the accessible area of contact is limited, and that is so designed and protected that, under normal operating conditions and single fault conditions, the voltages do not exceed specified limit values based upon the type of TNV circuit.

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PART AE

GENERAL PRODUCT CONSTRUCTION REQUIREMENTS

AE1.0	CONSTRUCTION DETAILS
AE1.1	Unless otherwise described or supplemented in individual Test Reports, the requirements specified in Table AE1 apply to all equipment included in this Procedure
AE1.2	All clause references are from the Standard for Safety of Information Technology Equipment, UL 60950, Third Edition and UL 60950-1, First Edition.

TABLE AE1
CONSTRUCTION DETAILS

Clause	Clause Title	Clause Specifics
		None specified

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PART AF

UL CERTIFICATION MARK

<i>Product Category:</i>	Audio/video, Information and Communication Technology Equipment
<i>Product Category CCN:</i>	AZOT

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AF1.1	The Test Report covering each product must be consulted to determine which Listing Marks are authorized for use in conjunction with that product.
AF1.1.1	The following Listing Mark is authorized for use on products that are Listed only to the requirements for the United States: <div style="text-align: center;">  </div>
AF1.1.2	Either of the following Listing Marks is authorized for use on products that are Listed to the requirements of both the United States and Canada: <div style="text-align: center;">   </div>
AF1.2	The Listing Mark consists of four elements that are placed in close proximity to each other and shall appear on Listed products only.
AF1.2.1	Element 1 - UL Symbol. There is no required minimum height for the UL Symbol, as long as it is legible. The minimum height of the registered trademark symbol ® shall be 3/64 of an inch. When the overall diameter of the UL Symbol is less than 3/8 of an inch, the trademark symbol may be omitted if it is not legible to the naked eye. Information on downloading electronic versions or receiving camera-ready artwork of the UL Symbols may be obtained at www.ul.com
AF1.2.2	Element 2 - The word "LISTED"
AF1.2.3	Element 3 - A product identity
AF1.2.3.1	The product identity is: "INFORMATION TECHNOLOGY EQUIPMENT" or its abbreviations, "AV EQUIPMENT", "AV&ICT", "COPIER", "MUSICAL INSTRUMENT", "PAPER SHREDDER", "PERSONAL COMPUTER", or other appropriate name as shown in the individual Test Reports.
AF1.2.3.2	The product identity may be omitted if the Listing Mark is directly and permanently applied to the product by stamping, molding, ink-stamping, silk screening or similar process. The product identity may appear elsewhere on the product if the other three elements are part of the nameplate that includes the rating or the catalog or model designation.
AF1.2.3.3	Where Rebuilt products are authorized in individual Test Reports, the product identity for such products shall be preceded by "REBUILT" or "REMANUFACTURED", as appropriate.
AF1.2.4	Element 4 – A control number represented above by XXXX is to be replaced with the Listee's file number.
AF1.3	A separable Listing Mark (not part of a nameplate and in the form of decals, stickers or labels) must include the four elements.
AF1.4	The manufacturer may reproduce the Listing Mark or obtain it from a UL authorized supplier.

Generic Inspection Instructions

PART AF
UL CERTIFICATION MARK

<i>Product Category:</i>	Audio/video, Information and Communication Technology Equipment
<i>Product Category CCN:</i>	AZOT7

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AF1.1	The Test Report covering each product must be consulted to determine which Listing Marks are authorized for use in conjunction with that product.
AF1.1.1	The following Listing Mark is authorized for use on products that are Listed only to the requirements for Canada: 
AF1.1.2	Either of the following Listing Marks is authorized for use on products that are Listed to the requirements of both the United States and Canada: 
AF1.2	The Listing Mark consists of four elements that are placed in close proximity to each other and shall appear on Listed products only.
AF1.2.1	Element 1 - UL Symbol. There is no required minimum height for the UL Symbol, as long as it is legible. The minimum height of the registered trademark symbol ® shall be 3/64 of an inch. When the overall diameter of the UL Symbol is less than 3/8 of an inch, the trademark symbol may be omitted if it is not legible to the naked eye. Information on downloading electronic versions or receiving camera-ready artwork of the UL Symbols may be obtained at www.ul.com
AF1.2.2	Element 2 - The word "LISTED"
AF1.2.3	Element 3 - A product identity
AF1.2.3.1	The product identity is: "INFORMATION TECHNOLOGY EQUIPMENT" or its abbreviations, "AV EQUIPMENT", "AV&ICT", "COPIER", "MUSICAL INSTRUMENT", "PAPER SHREDDER", "PERSONAL COMPUTER", or other appropriate name as shown in the individual Test Reports.
AF1.2.3.2	The product identity may be omitted if the Listing Mark is directly and permanently applied to the product by stamping, molding, ink-stamping, silk screening or similar process. The product identity may appear elsewhere on the product if the other three elements are part of the nameplate that includes the rating or the catalog or model designation.
AF1.2.3.3	Where Rebuilt products are authorized in individual Test Reports, the product identity for such products shall be preceded by "REBUILT" or "REMANUFACTURED", as appropriate.
AF1.2.4	Element 4 – A control number represented above by XXXX is to be replaced with the Listee’s file number.
AF1.3	A separable Listing Mark (not part of a nameplate and in the form of decals, stickers or labels) must include the four elements.
AF1.4	The manufacturer may reproduce the Listing Mark or obtain it from a UL authorized supplier.

UL TEST REPORT AND PROCEDURE

Standard:	UL 62368-1, 3rd Ed, Issued: 2019-12-13 (Audio/video, information and communication technology equipment Part 1: Safety requirements) CAN/CSA C22.2 No. 62368-1:19, 3rd Ed, Issued: 2019-12-13 (Audio/video, information and communication technology equipment Part 1: Safety requirements)
Certification Type:	Listing
CCN:	AZOT, AZOT7 (Audio/video, Information and Communication Technology Equipment)
Complementary CCN:	N/A
Product:	Audio Server
Model:	SPA-S1000
Rating:	Input: 120-240 Vac, 50/60 Hz, 100 mA or 24 Vdc, 350 mA
Applicant Name and Address:	HANWHA TECHWIN CO LTD 6, PANGYO-RO 319BEON-GIL, BUNDANG-GU SEONGNAM-SI GYEONGGI-DO 13488 KOREA

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.

Prepared By: HyeongKyun Park / Project
Handler

Reviewed By: BumSeok Na / Reviewer

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

This product acts as a server in network systems that provide an integrated transmission solution via network infrastructure. It provides integrated control software for voice reproduction and BGM control by interworking between complex and wide systems (PA, SR, AV) and provides ideal solution for various spaces such as large industrial complex, hospital, restaurant, and school.

Model Differences

N/A

Test Item Particulars

Product group	end product
Classification of use by	Ordinary person Children likely to be present
Supply Connection	AC Mains
Supply tolerance	+10%/-10%
Supply connection – type	pluggable equipment type A - appliance coupler mating connector for 24 Vdc
Considered current rating of protective device	20 A; Location: building
Equipment mobility	movable SRME/rack-mounted
Over voltage category (OVC)	OVC II
Class of equipment	Class I
Special installation location	N/A
Pollution degree (PD)	PD 2
Manufacturer's specified T _{ma} (°C)	40
IP protection class	IPX0
Power systems	TN
Altitude during operation (m)	2000 m or less
Altitude of test laboratory (m)	2000 m or less
Mass of equipment (kg)	2.95

Technical Considerations

- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of : 40 °C
- The product is intended for use on the following power systems : TN
- Considered current rating of protective device as part of the building installation (A) : 20
- Mains supply tolerance (%) or absolute mains supply : +10%/-10%
- The equipment disconnect device is considered to be : Appliance inlet
- The following circuit locations (with circuit/schematic designation) were investigated as a limited power source (LPS) : All accessible connectors
- The following are available from the Applicant upon request : Installation (Safety) Instructions / Manual

Additional Information

New (4789961844)

- Max. Normal Load : Continuous operation with ethernet switch.

Additional Standards

The product fulfills the requirements of: N/A

Markings and Instructions

Clause Title	Marking or Instruction Details
Equipment identification marking – Manufacturer identification	Listee's or Recognized Company's name, Trade Name, Trademark or File Number
Equipment identification marking – model identification	Model Number
Equipment rating marking – ratings	Input Ratings (voltage, frequency/dc, current/power) Output Ratings (voltage, frequency/dc, current/power)
Symbols - On/Off switch	Switches to be marked with  symbol for "ON" (IEC 60417-5007) and  symbol for "OFF" (IEC 60417-5008)
Battery replacement	Provided (on equipment, in instruction manual) CAUTION - Risk of fire or explosion if the battery is replaced by an incorrect type. Dispose of Used Batteries According to the Instructions
Class I equipment -Terminal for main protective earthing	Provided adjacent to the main protective earthing material  (IEC 60417-5019)

Safety Instructions - Rack Mount	<p>"Rack Mount Instructions - The following or similar rack-mount instructions are included with the installation instructions:</p> <p>A) Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (T_{ma}) specified by the manufacturer.</p> <p>B) Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.</p> <p>C) Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.</p> <p>D) Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.</p> <p>E) Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips)."</p>
Special Instructions to UL Representative N/A	

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

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

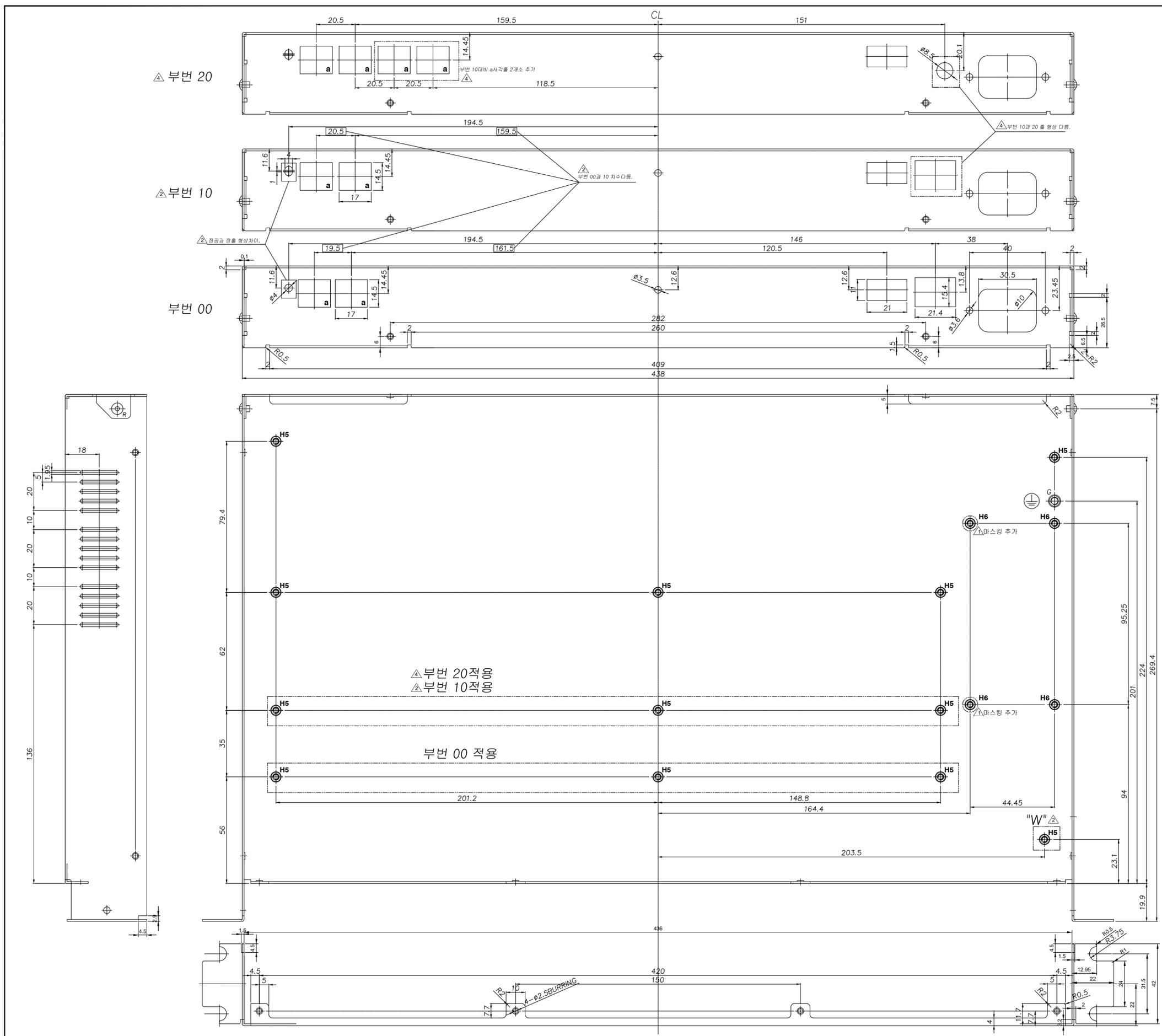
4.1.2	TABLE: List of critical components					Pass
Object / part No.	Manufacturer/ trademark	Type / model	Technical data	Product Category CCN(s)	Mark(s) of conformity	Supplement ID
Power supply cords set	KOREA KDK CO LTD	KKP-30SJTKKS-16A	Type SJT, 18/3 AWG, 125 V, 10 A, 105 deg. C, max 4.5 m long; One end with NEMA 5-15. Other end with appliance coupler	ELBZ	UL (E58075)	
Power supply cords set	Interchangeable	Interchangeable	Type SJT, 18/3 AWG, 125 V, 10 A, 105 deg. C, max 4.5 m long; One end with NEMA 5-15. Other end with appliance coupler	ELBZ	UL	
Top enclosure (Elec/Mech/Fire)	Interchangeable	Interchangeable	Metal, Min. 0.8 mm thickness. See enclosure for dimension.	---	---	
front enclosure (Elec/Mech/Fire)	Interchangeable	Interchangeable	Metal, Min. 0.8 mm thickness. See enclosure for dimension.	---	---	
Bottom enclosure (Elec/Mech/Fire)	Interchangeable	Interchangeable	Metal, Min. 1.5 mm thickness. See enclosure for dimension.	---	---	
Open type SMPS	MEAN WELL ENTERPRISES CO LTD	EPS-65-24z (@)	Rated input: 100-240 V~, 50/60 Hz, 1.5 A Rated output: 24 Vdc, 2.71 A	QQJQ2	UL (E183223)	
Appliance inlet	RONG FENG INDUSTRIAL CO LTD	SS-7B-1	15 A, 250 V~	AXUT2	UL (E102641)	
Switch (Primary)	ALPS ALPINE CO., LTD.	SDDJE-3	10 A, 250 V~	WOYR2	UL (E38433)	

AC Connector (Wafer)	Japan Solderless Terminal Mfg Co Ltd	B2P	10A, 250V, PA66, V-0, 85 deg.C	ECBT2	UL (E60389)	
AC Connector (Housing)	YEON HO ELECTRONICS CO LTD	YH-396-03V	5A, 250V, PA66, V-0, 85 deg.C	ECBT2	UL (E108706)	
Protective bonding conductor	HAE KWANG CABLE	1015	18 AWG, 600 Vac, 80 or 90 or 105 deg.C	AVLV2	UL (E300577)	
Fuse (24 Vdc line)	LITTELFUSE INC	218*+	T0.8AL, 250V	JDYX2	UL (E10480)	
DC Input connector (for 24 Vdc)	CIXI WANJIE ELECTRON CO LTD	WJ2EDGR-5.08	300 V, 15 A	XCFR2	UL (E251331)	
Coin cell (for RTC)	PANASONIC CORPORATION	ML621*	Lithium alloy (Coin), Max charging current: 300 mA, Max charging voltage: 12 Vdc	BBCV2	UL (MH12210)	
Protective device for Coin cell (IC47)	Maxim Integrated Products, Inc	DS3231# (a) (DS3231SN)	Reverse Charging Protection Integrated Circuit Chip, 3.0 V,	NWGQ2	UL (E141114)	
Protective device for Coin cell (R309)	Interchangeable	Interchangeable	220 ohm, 0.1 W	---	---	
Internal wiring (Primary)	Interchangeable	1617	Double insulation, 22 AWG, 600 V, 105 deg.C. marked, VW-1	AVLV2	UL	
Internal wiring (Secondary)	Interchangeable	Interchangeable	Double insulation, 18 AWG, 600 V, CW-1, 105 deg.C. marked, VW-1	AVLV2	UL	
Flexible flat cable (Secondary)	Interchangeable	Interchangeable	marked VW-1; 30 V, 80 deg. C	AVLV2	UL	
Printed wiring board	Interchangeable	Interchangeable	Min. V-0, 130 deg.C	ZPMV2	UL	
Label	Interchangeable	Interchangeable	Max. 80 °C, for application to Indoor use	PGDQ2 or PGJI2, PGAA	UL	

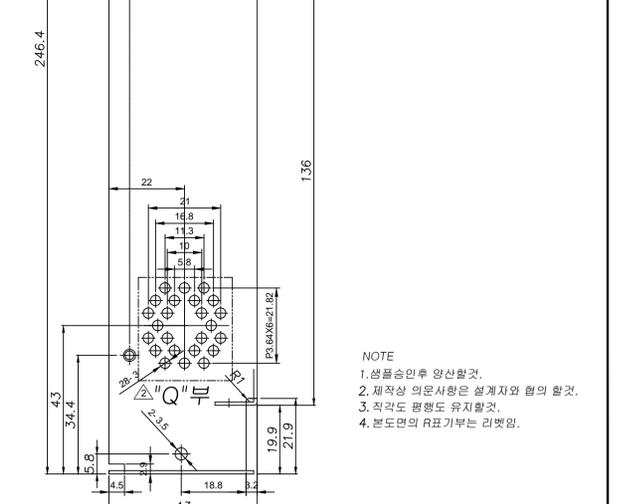
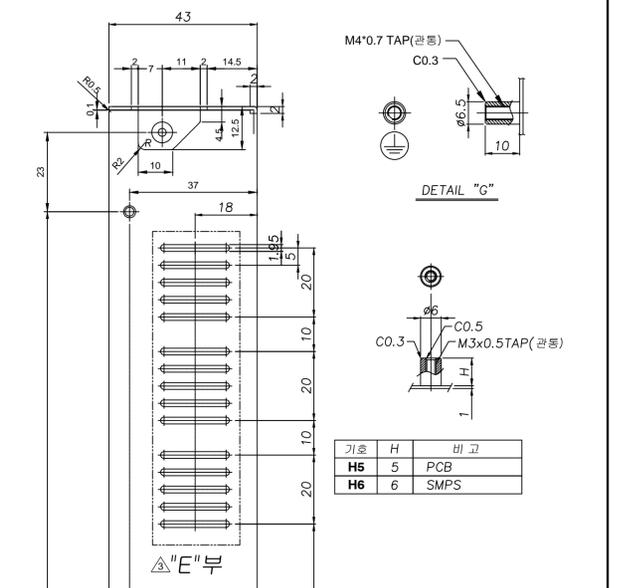
Enclosures

Type	Supplement Id	Description
Photographs	03-01	External
Photographs	03-02	External
Photographs	03-03	Bottom
Photographs	03-04	Internal
Photographs	03-05	Main board Top
Photographs	03-06	Main board Bottom
Diagrams	04-01	Mechanical drawing
Miscellaneous	07-01	Label drawing
Miscellaneous	07-02	CRD for Dual language

The following Page(s) are related to Diagrams-01. The next supplement, if applicable, will be identified with a new Supplement Page Heading



DIMENSION	f	m	⊙	v	DATE	SIGN	REVISION	DESIGNED	용
0.5~3	±0.05	±0.1	±0.2	-	17.3.14		원도작성	차지훈	기본제작용
3~6	±0.05	±0.1	±0.3	±0.5	17.12.11		마스킹 2개소 추가	차지훈	기본제작용
6~30	±0.1	±0.2	±0.5	±1	19.3.5		"Q"부 적용, 부변 R45대변을 1개소 추가	차지훈	기본제작용
30~100	±0.15	±0.3	±0.8	±1.5	19.8.5		"E"부 적용	차지훈	기본제작용
100~400	±0.2	±0.5	±1.2	±2.5	20.9.23		IPA-1000로 부변 20 추가	차지훈	기본제작용
400~1000	±0.3	±0.8	±2	±4					
1000~2000	±0.5	±1.2	±3	±6					
2000~4000	-	±2	±4	±8					



REG.NO	PART NAME	PART NUMBER	"Q"부 적용	"W"부 적용	"E"부 적용	IRIS NO.	비고
20	MAIN CHASSIS	61A0044220	X	X	X	P120337	IPA-1000
10	MAIN CHASSIS	61A0044210	X	X	O	148130	SEB-BS1000내재용
00	MAIN CHASSIS	61A0044200	O	O	X	143063	조달 ONB-S

MODEL	NCS-1000	MATERIAL	SECC 11	NAME	MAIN CHASSIS
DESIGNED	CHECKED	APPROVED	FINISH	BLACK SPRAY & SILK	
차지훈			SCALE	1/1	DWG.NO 61A00442 지정

153940

CAUTION : TO RESCUE THE RISK OF ELECTRIC SHOCK, GROUNDING OF THE CENTER PIN OF THIS PLUG MUST BE MAINTAINED. DO NOT REMOVE COVER. NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

WARNING : TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

ATTENTION : RISQUE DE CHOC ELECTRIQUE NE PAS OUVRIR.

AUDIO SERVER

MODEL : SPA-S1000

MADE IN KOREA

Hanwha Techn Co., Ltd.

AC INPUT 120-240V ~50/60Hz, 100mA

DC INPUT 24V $\overline{\text{=}}$, 350mA



The following Page(s) are related to Miscellaneous-02. The next supplement, if applicable, will be identified with a new Supplement Page Heading

Clause/Par. Reference and Construction Requirement	Comply			Comments/Measurements	Inst. ID No.
	Yes	No	N/A		
9.2.3 CBs shall include dual language safety labeling within their product certification requirements, if so required by the standard or by the authority having jurisdiction.					
The manufacturer has confirmed they have the ability to include English and French safety labeling exactly as specified in the product standard; or, if NOT specified in the product standard, the ability to include English and French safety labelling consisting of markings associated with the signal words DANGER, WARNING, and CAUTION when required.	X			The ability of the manufacturer to include these markings was verified by either (1) visual inspection of the markings on the actual product or (2) draft of labels that will be applied to the product or (3) written confirmation from the customer of the markings that will appear on the product. If the product standard provides the exact translation, the evidence must match the exact translation. If the product standard does NOT provide the exact translation, the evidence must simply include both the English and French text (no verification of translation is required).	N/A

Clause/Par. Reference and Construction Requirement	Comply			Comments/Measurements	Inst. ID No.
	Yes	No	N/A		
Manufacturer has a method to manage distribution of products, IF all products with the Canadian certification mark are NOT going to include the dual language.			X	<p>Evaluation staff are to only verify that the manufacturer has a method to control distribution.</p> <p>Evaluation staff do not have to record the method of control nor are the evaluation staff expected to verify the effectiveness of the method of control. This requirement to verify that a method exists will be noted in the FUS Procedure. The UL Field Engineer will verify the method during surveillance.</p> <p>If the manufacturer is going to include the dual language on all products with the Canadian certification mark, then this item is N/A; no further action required.</p>	N/A

